Newsletter for the Canadian Antarctic Research Network

Bulletin pour le Réseau de recherches Antarctiques du Canada

Chairman's Remarks

Peter Suedfeld
Chair, CARP

As I discussed in the previous *CARN Newsletter,* major changes are afoot in the Canadian Antarctic enterprise. Among other things, Canada's application for full membership in SCAR has now been prepared and submitted, thanks in large measure to Olav Loken's hard work, ingenuity, dedication, and ability to get timely co-operation out of a committee made up of independent characters. I shall say more about the application and other impending developments in the next issue of the newsletter.

For now, I want to say thank you and farewell to Whit Fraser, the recently departed Chairman of the Canadian Polar Commission. Whit was among the first to recognize that the Commission is not merely the only arm of government with an exclusively polar mandate, but also the only one whose mandate is *inclusively* polar—that is, covering both polar regions. Four years ago, he initiated the first conference to discuss Canada's role in the Antarctic. Later, he arranged for the Polar Commission to provide financial support to the CARP and CARN when these bodies were being organized. He attended relevant Antarctic meetings, such as SCAR '96 at Cambridge, and lobbied the federal government on issues such as the establishment of the Polar Continental Shelf Project's Arctic–Antarctic Exchange Program.

(cont'd on p. 2)

Message de Président

Peter Suedfeld
Président, PRAC

Comme je l'ai indiqué dans le dernier bulletin de nouvelles du RCAC, des changements importants dans l'activité canadienne sur l'Antarctique se préparent. Exemple : le Canada a présenté une demande en vue de devenir membre à part entière du CSRA. Cette action résulte en grande partie de l'ardeur au travail, de l'ingéniosité et du dévouement d'Olav Loken qui a réussi à obtenir, au moment opportun, la collaboration d'un comité composé de membres indépendants. Je reparlerai de cette demande d'adhésion et des autres réalisations imminentes dans le prochain numéro du bulletin.

Pour l'instant, j'aimerais remercier Whit Fraser, le président qui vient de quitter la Commission canadienne des affaires polaires, et lui faire mes adieux. Whit a été l'un des premiers à reconnaître que la Commission n'est pas seulement le segment du gouvernement qui se consacre aux questions polaires, mais aussi le seul organisme dont le mandat englobe toutes les zones polaires, c'est-à-dire les deux pôles. Il y a quatre ans, il a organisé la première conférence pour débattre du rôle du Canada dans l'Antarctique. Plus tard, il a pris des mesures pour que la Commission canadienne des affaires polaires fournisse une aide financière au PCRA et au RCAC lorsqu'ils ont été mis sur pied. Il a assisté à des conférences

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Although Whit is not a scientist, he has been a vocal and steadfast supporter of polar science. While his experience is primarily in the Canadian North, he has always been clear about the importance of the south polar region and Canada's connections with it. I'm hesitant about counterfactuals, so I won't suggest that our many accomplishments or our higher visibility in Antarctic organizations would not have been achieved without Whit's contributions, but he was certainly a central figure in making them happen when and as they did.

On behalf of CARP, I congratulate Whit on his two successful terms at the helm of the Commission, thank him for his support, and wish him much success and enjoyment in the future.

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By filing the application for full membership, the Polar Commission has raised expectations, both at home and abroad, that Canada will increase its involvement with SCAR. Among other things, this means that we need more detailed advance planning and budgeting for future activities. This can happen only if the vacancies on the Commission's board of directors are filled promptly by individuals with at least some understanding of, and interest in, Canada's Antarctic role. That will enable the new board to consider the impact of the SCAR application at an early date and to make the decisions that full membership implies.

sur l'Antarctique, notamment à SCAR 96, à Cambridge, et il a fait pression sur le gouvernement fédéral pour qu'il adopte, entre autres, le programme d'échanges Arctique-Antarctique du Projet d'étude du plateau continental polaire.

Même s'il n'est pas un scientifique, Whit a toujours été un ardent défenseur de la science polaire. Son expérience est surtout axée sur le Nord canadien, mais il a toujours insisté sur l'importance de la région polaire du sud et des rapports qui existent entre cette région et le Canada. Je ne veux pas faire de déclarations contre-factuelles. Donc, je ne prétendrai pas que nos nombreuses réalisations ou notre prestige auprès des organismes qui s'intéressent à l'Antarctique résultent uniquement de l'action qu'il a engagée. Je peux cependant affirmer que Whit a joué un rôle de premier plan dans les initiatives qui ont mené au succès.

Au nom du PCRA, je félicite Whit qui a rempli avec brio ses deux mandats successifs de chef de la Commission. Je le remercie de son appui et lui souhaite beaucoup de succès et de satisfaction.

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En demandant le statut de membre à part entière du CSRA, la Commission canadienne des affaires polaires a créé des attentes, au pays et à l'étranger. En effet, on espère que le Canada participera davantage aux activités du CSRA. Cela veut dire, entre autres, que nous devons planifier davantage et augmenter les crédits pour les futures activités. Pour que cet objectif soit atteint, il faut que les postes vacants au conseil de la Commission soient comblés rapidement par des personnes qui comprennent le rôle du Canada en rapport avec l'Antarctique, et qui s'y intéressent. Ainsi le nouveau conseil d'administration pourra examiner sans tarder les effets de la demande présentée au CSRA et prendre les décisions qui incombent à un membre à part entière de cet organisme.

New Era for Polar Commission

JoAnne Deneron, Acting Chair
Canadian Polar Commission

This year marks a turning point for the Canadian Polar Commission. With the retirement of the Commission's founding Chair and two of its original board members, we open a new era—an era in which we will consider a number of new challenges while broadening the scope of our interests with respect to polar knowledge. I share with my colleagues the sense that the Polar Commission has much to contribute to the advancement of arctic and antarctic studies in Canada, and I feel certain that we will be successful in convincing policy makers of the need to support this crucial component of our national strategy for science and technology.

It is my intention as Acting Chair to focus on four main areas which represent the core of the Commission's mandate:

- to review and monitor the state of polar knowledge in Canada;
- to expand the reach of our public affairs and communications function;
- to work co-operatively toward the development of a coherent polar science policy and encourage co-ordination among departments and agencies of government at all levels; and
- to strengthen Canada's contributions to the advancement of polar science at the international level.

Good things are happening in Canadian polar science. We have to make Canadians aware of that fact, and actively promote the innovation and imagination shown by Canadian researchers. At the same time, we must be conscious that fiscal reality—even in times of relative prosperity—may act to limit our future endeavours, however admirable. We will have to make choices, and we will have to weigh carefully our priorities with respect to funding and the extent to which

public-sector support for polar science is both feasible and desirable. To this end, it is my desire to see the Polar Commission work toward a positive and supportive relationship with Canada's corporate community and explore mutually beneficial means by which to partner with the private sector. However, we must also be aware that the interests of polar knowledge are ill-served by strategies that favour one constituency over another; I believe that the Commission can best serve Canadians at the *national* level while at the same time maintaining strong working relationships with governments, industry, universities, and northern communities.

The Commission will continue to serve as Canada's representative to international polar science bodies such as the International Arctic Science Committee (IASC) and the Scientific Committee on Antarctic Research (SCAR). We consider these to be important fora, not only for information exchange but for the development of co-ordinated responses to problems affecting the polar regions. Earlier this year, the Commission submitted a formal application for full membership in SCAR—a clear signal to others in the Antarctic scientific community that Canada is prepared to assume a higher and more active profile in the region. On behalf of the Commission, I would like to extend our thanks to the team of scientists who prepared the application. This represents an important step forward in fulfilling our statutory mandate concerning Antarctica, and we will endeavour to provide continuing and stable support for the new Canadian Committee on Antarctic Research (CCAR) once it is established. Through CCAR, the Commission will provide a framework for wider participation in Antarctic science. However, it will be up to the creativity and initiative of the Canadian scientific community to make effective use of this new "window of opportunity". The resources necessary to support the research activities themselves must come from granting councils, government departments, business, and other sources. For its part, the Commission will ensure that these agencies understand the significance of Antarctic science, by stressing the value of bipolar studies and the need for a sound scientific basis for implementing the Environmental Protocol.

The Commission is also co-operating as a partner in initiatives designed to provide improved access to international arctic data holdings, through bodies such as the Arctic Environmental Data Directory (ADD) Council and the Joint Committee on Antarctic Data Management (JCADM). We will serve as the national focal point for polar information and data, and work with other arctic and non-arctic states in the development of appropriate standards and protocols.

The Polar Commission is Canada's bridge to the international polar science community. As the Arctic Council grows and develops, we will work with it and its affiliated institutions to develop a strong presence for Canada in the polar sciences; at the same time, the Commission will establish and maintain a regular exchange of information with research institutes in other circumpolar countries.

To attain the objectives set out above may well require a reordering of our priorities so as to reflect better the mandate of the Commission in our day-to-day operations. To be effective as an advisory agency, the Commission must itself be engaged in the "business" of polar knowledge. We must actively foster strong links with Canada's science community, with industry, with international bodies, and with northern organizations. Though it has been stated before, it bears repeating that the Polar Commission is not a service agency, nor is it a "doer" or funder of polar research; at the same time, we have the capability to serve as an effective, public voice on issues affecting the quality of polar science in Canada.

In conclusion, I would invite those with an interest in the future of polar science to view the Commission as a strong, resourceful, and capable ally. There is no denying that the effects of fiscal restraint and policies designed to wean research from reliance on public funding have done damage to Canada's scientific community; but I believe, too, that the next decade will see the field of polar science emerge as an example of how improved efficiencies, effective partnerships, and long-term thinking can be rewarded with excellence.

Report on XXI ATCM

The 21st Antarctic Treaty Consultative Meeting (XXI ATCM) was held at Christchurch, New Zealand, May 19–30, 1997. As has been the case in recent years, the focus of discussion was the Protocol on Environmental Protection which, when implemented, will affect many of the national policies and international relations that are the main business of the consultative meetings.

Ratification by all 26 Consultative Parties is needed before the Protocol can come into force. At the close of the 1996 meeting, ratification by three countries was outstanding (Japan, Russia, and the United States), and it seemed likely that the process would be completed before the XXI ATCM. Thus, the Christchurch meeting was initially planned as the first meeting in which the Protocol and its operational instrument, the international Committee on Environmental Protection, would be in force. However, it soon became evident that this would not be the case, and the Christchurch meeting was relegated to the status of a "hold-the-line" assembly, attending to a number of practical items pending the implementation of the Protocol.

The United States ratified the Environmental Protocol in April 1997, and Russia announced at Christchurch that it, too, had completed the ratification process. With Japan now the sole country left to ratify, it is expected that the Protocol will come into force well before the next ATCM in Tromsø, Norway, in May 1998; plans are already underway for a preliminary meeting of the Committee on Environmental Protection in advance of that meeting. The Protocol will be binding on 42 countries and will be the world's strongest international environmental protection instrument.

Canada signed the Environmental Protocol in 1991, but has yet to ratify it. Although no formal announcement was made at Christchurch, it was noted informally, in response to questions, that Canada is considering the matter. Once again, the NGO news leaflet, *ECO*, produced during the meeting, stated the importance and urgency for Canada, as the leading Antarctic tourist operator, to ratify the Protocol.

Some of the side issues dealt with at the ATCM, and connected with the Environmental Protocol, included:

- continuing work by international lawyers on the difficult problem of how to define "damage" to the polar environment and ecosystems, and how to assign liability and enforce compliance in an area where national legal jurisdiction does not apply;
- problems raised by the Protocol with respect to insurance for ships, aircraft, and expeditions;
- environmental impact assessment in Antarctica, which will become mandatory for all activities; and
- the relationship between the Antarctic Protocol and other international treaties and protocols regarding protection of the marine environment.

A topic of growing importance in the ATCM is that of designation and management of protected areas. The Treaty provides for a wide variety of protected-area categories, including Antarctic Specially Protected Areas (ASPAs), Sites of Special Scientific Interest (SSSIs), Specially Managed Areas (SMAs), and Historic Sites and Monuments (HSMs). The ATCM is making progress in clearing up confusion in this complex system.

Under the agenda topic, "Relevance of Developments in the Arctic and the Antarctic", Norway reported developments with respect to the Arctic Council and the Arctic Environmental Protection Strategy. Canada provided all delegations with a copy of the Arctic Council Declaration, as well as information on CAFF and AEPS activity, and announced the exchange program for Arctic and Antarctic scientists instigated by the Polar Continental Shelf Project. Canada and Chile jointly drew attention to the "Poles Apart" conference to be held in Ottawa in September. At the request of Denmark, the Canadian delegate also described the new Danish long-term arctic research station at Zackenberg, which is expected to become a valuable northern hemisphere counterpart to Antarctic environmental monitoring stations.

The ATCM agreed on the need to facilitate continued interaction concerning scientific activities in the Arctic and the Antarctic. Norway was asked to report on the ATCM at the AEPS Ministerial Meeting in Alta, Norway in June 1997. It was also noted that SCAR and IASC were co-sponsoring a symposium on "Polar Aspects of Global Change", to be held in Tromsø in 1998.

Tourism remains the dominant non-governmental activity in Antarctica though the absolute number of recorded tourists in the 1996–97 season was down somewhat from the record of the year before. Marine Expeditions Inc. of Toronto remains the world leader in taking tourists to the Antarctic. The ATCM dealt with development of a standard reporting form that will provide information for assessing environmental damage, setting safety standards, and implementing action in emergency situations. The "Code for Polar Navigation" developed for the Arctic through the AEPS Protection of the Arctic Marine Environment (PAME) program will be assessed for its applicability to Antarctic tourist and supply ships.

Other ATCM Items in Brief

- SCAR and COMNAP are developing an Antarctic Master Directory (AMD) at the International Centre for Antarctic Information and Research (ICAIR) in Christchurch, New Zealand which will provide information on Antarctic data held in each country and how it can be accessed. Further information is available at *http://www.icair.iac.org.nz* (See also "Co-ordination of Antarctic Data", *CARN Newsletter* No. 4).
- SCAR reported new programmes and protocols for providing meso-scale sea-ice data for use in global climate models.
- New ice-core data on the chemical composition of the Antarctic atmosphere over the last 200 years provides a fine-scale southern hemisphere baseline for recent climate change (SCAR/IGBP).
- New high-frequency space radars installed in the United Kingdom, Japan, and South Africa offer new capacity for "triangulation" space research.
- The springtime "hole" in stratospheric ozone is deepening and enlarging over the southern polar region. The World Meteorological Organization (WMO) interpretation is that it will be another five years or so before any change in the present trend is likely.
- Some Adelie penguin colonies have become infected with a poultry disease, presumably from imported chicken products. The seriousness of the infection or the ability of penguins to cope with the disease is not known.
- NASA has expressed interest in the possible testing of space technologies in the sub-glacial Lake Vostok (see *CARN Newsletter* No. 3, p. 6) for future studies of the ice-covered moon Europa; however, the Russian delegation asserted that there would be no penetration of the lake until the project has been fully reviewed by the international scientific community and subjected to full environmental assessment.

- As announced at XX ATCM, Bulgaria formally applied for Consultative Status under the Treaty, but did not meet the conditions for advance notice and consultations; the application will be reconsidered at XXII ATCM.

A more complete report on the meeting will be deposited with the Ambassador for Circumpolar Affairs, DFAIT.

For further information, contact E. F. Roots: Telephone (819) 997-2393 Fax: (819) 997-5813.

SCAR Global Change Program

While on sabbatical in Australia earlier this year I had the opportunity of participating in the GLOCHANT meeting held at the Antarctic Cooperative Research Centre (Antarctic CRC) in Hobart, Tasmania. GLOCHANT is the SCAR Group of Specialists on Global Change and the Antarctic, and is the working group which oversees the SCAR Global Change Program. This program has been implemented in recognition of the major role that Antarctica plays in the global system (e.g., in freshwater storage, sea level change, albedo effects, atmospheric circulation, deep water formation, and ozone depletion). In keeping with what IGBP Executive Director Dr. Chris Rapley calls "Acronym Attack", this program consists of the following components:

ANTIME: Late quaternary record of the Antarctic ice margin evolution
ASPECT: Antarctic sea ice processes and climate
BIOTAS: Biological investigations of terrestrial Antarctic systems
EASIZ: Ecology of the Antarctic Sea Ice Zone
ISMASS: Ice sheet mass balance and sea level
IASE: International trans-Antarctic scientific expedition
PICE: Paleoenvironments from ice cores

There are also links to biological programs on sea ice processes and land/water ecosystems. The co-ordination of research on this broad sweep of subjects is run out of the SCAR Global Change office which is managed by Dr. Ian Goodwin and based within the Antarctic CRC.

The meeting allowed international representatives for each of the components to bring the group up to date on progress, which has been considerable on many fronts. The program appears to be one of SCAR's most active research initiatives at present, with a variety of potential opportunities for Canadian bipolar involvement. Further information (including contact details) can be found at the website *http://www.antcrc.utas.edu.au/scar/scar.html.*

Poles Apart: A Study in Contrasts

The recent conference, "Poles Apart: A Study in Contrasts", held at the University of Ottawa, September 25 to 27, 1997, was a forum unusual for both its theme and the varied backgrounds of those who participated. About 120 natural scientists, social scientists, managers, and politicians provided an intriguing snapshot of the major interests, strengths, and weaknesses of Canadian knowledge in the polar regions.

Although Canada boasts a growing number of scientists experienced in Antarctic matters, it is notable that all of the Antarctic presentations at the conference were given by non-Canadians. Not surprisingly, Canadians were well represented on virtually all aspects of the Arctic; however, many of the presentations tended toward the parochial, concentrating solely on the Canadian Arctic rather than the broader circumpolar North. Barely mentioned was Canada's role as a party to the Antarctic Treaty System; as one participant commented, Antarctic perceptions appear to be all-encompassing whereas those relating to the Arctic tend to be nationalistic—the broad picture versus a narrow view.

Among the presentations, several were particularly noteworthy. Dr. Hugh French of the University of Ottawa and Dr. David Sugden of the University of Edinburgh spoke on the geography of the polar regions, presenting complementary views of the Arctic and Antarctic land masses. Norman Hallendy of Ottawa discussed *inukshuk*, the "standing stones" that have become a symbol of the Canadian Arctic. Dr. Graham Barrett, of Lincoln University in New Zealand, explained how the study of seals has contributed to investigations of some human medical problems, such as Sudden Infant Death Syndrome.

The "Poles Apart" meeting highlighted several important factors: the significant contrasts between the two polar regions; the vast depth of Canadian Arctic expertise and the contrasting absence of Antarctic expertise; a general lack of knowledge and understanding in Canada with respect to the Antarctic; and hope that future Antarctic undertakings will be enriched by Canadian Arctic knowledge. The conference theme, "A Study in Contrasts", was reflected in topics that included: past and future governance of the polar regions; the nature of science; political and historical connotations; and environmental problems.

Dr. Antoni Lewkowicz and his colleagues at the University of Ottawa are to be applauded for organizing such a valuable and yet difficult conference. Papers from the conference are to be published early next year. Plans for a follow-up session in 1999 were announced by the rector of the university in Punta Arenas, Chile.

The post-conference orientation and discussion regarding Canada's recent application for full membership in of the Scientific Committee on Antarctic Research (SCAR) was poorly attended—particularly in light of the Chilean offer to visit the Antarctic next year. While the signficance of Antarctic studies for Canada is not widely appreciated within this country, the SCAR application may point the way to a framework for future Canadian participation in Antarctic science. However, support, initiative, and creativity will be necessary if we are to capitalize on recent progress.

(From Prof. Kevin Hall, University of Northern British Columbia, Prince George, B.C.)

IAATO – NSF Meeting

The annual meeting between the National Science Foundation (NSF) and the International Association of Antarctic Tour Operators (IAATO) was held in Washington, D.C. on July 9, 1997. Canadian companies Adventure Network International and Marine Expeditions Inc. were among the 12 major tour operators participating in the meeting, along with representatives of government agencies in Canada, Germany, the United Kingdom, and the United States, public interest groups, consultants, and the public at large. The agenda included a review of last year's operations, a preview of the next season, an update on relevant developments within the NSF, and a general exchange of information.

During the 1996–97 season, 13 tour vessels made 104 separate voyages, transporting 7,322 passengers to Antarctica. Between them, the vessels visited and landed passengers at 108 separate sites. In total, 946 landings were made, the majority of them in the Peninsula area. Ships operated by Marine Expeditions Inc. of Toronto made 48 voyages carrying about 40 per cent of all shipborne passengers. (Some voyages were subcontracted to other tour operators.) Many tour operators assist scientific programs by transporting scientists and equipment onboard their ships, particularly in the Peninsula area.

Overall, the number of passengers was down about 20 per cent compared with the previous season, principally because the largest vessel in the trade did not go south in 1996–97. However, the ship is scheduled to return next year, when IAATO estimates that about 10,500 tourists will visit the continent; that number is expected to climb to 14,000 by 2000–01.

Some Recent Canadian Contributions to Antarctic Science

(Names of Canadian co-authors are underlined, except when all are Canadians.)

Doran, P. T., C.P. McKay, W.P. Adams, M.C. English, R.A. Wharton, and M.A. Meyer. 1996: "Climate forcing and thermal feedback of residual lake-ice cover in the high Arctic." *Limnol. Oceanog.* 41,5: 839–48.

James, T.S. 1997: "Global geodetic signatures of the Antarctic ice sheet." *Journ. of Geophys. Research* 102.B1:605–633.

Pahl, B.C., J.M. Terhune, and H. Burton. 1997: "Repertoire and geographic variation in underwater vocalisations of Weddell seals *(Leptonychotes weddellii, Pinnipedia: Phocidae)* at the Vestfold Hills, Antarctica." *Australian Journ. of Zoology* 45:171–187.

Vincent, W.F. and A. Quesada. 1997: "Microbal niches in the polar environment and the escape from UV radiation in non-marine habitats." In Battaglia, B, J. Valencia, and D.W.H. Walton (eds.) 1997: *Antarctic Communities – Species, Structure and Survival.* Cambridge University Press. 388–396.

Also of interest:

Head, E. (ed.) 1997: *Ecosystem considerations for krill and other forage fisheries.* Proceedings of a workshop, Halifax, N.S., 2–4 April, 1997. Canadian Stock Assessment Proceedings, Series 97/5, Fisheries and Oceans Canada. 61 pp. (mim.).

Loken, O.H. 1997: *Canadians in Antarctic and Bipolar Science.* Canadian Polar Commission. Polaris Papers No. 12, 42 pp.

OPPORTUNITIES

Offers of Support from Canadian Tour Operators

Readers are reminded of the generous offers of support extended by Adventure Network International (ANI) and Marine Expeditions Inc. (MEI) for Canadian scientists wishing to work in Antarctica. ANI has an end-of-February deadline for applications for support the following austral summer. The Canadian Antarctic Research Program will be consulted in selecting successful candidates. (See *CARN Newsletter* No. 3, p. 5, for additional information.)

RADARSAT Antarctic Mapping Project

The Canadian Space Agency is encouraging Canadian participation in research activities in connection with the RADARSAT Antarctic Mapping Project. A draft "Science Plan" has been prepared, and anyone can provide additional input or contribute specific project proposals.

Interested parties should contact: Mike Manore, Canada Centre for Remote Sensing, Tel: (613) 947-1281, e-mail: mike.manore@ccrs.nrcan.gc.ca

Canadian Scientists in Antarctica 1997–98

Dr. William Cochlan, University of Southern California, studies new and regenerated production in the Ross Sea as Principal Investigator under an NSF grant. (October–December)

Dr. Kathy Conlan, Canadian Museum of Nature, will continue studies of marine benthos in the McMurdo Sound area in co-operation with a team from the University of North Carolina (October–December)

Dr. Mary Lynn Dickson, University of Rhode Island, studies oxygen dynamics as part of a JGOFS Southern Ocean study. (October–December)

Dr. Peter Doran, Desert Research Institute, University of Nevada, will study paleolimnology in the Dry Valleys area and in the Bunger Oasis. (October–January)

Prof. Nick Eyles, University of Toronto, will participate in Leg 178 of the Ocean Drilling Program off the west coast of the Antarctic Peninsula. (February–March)

Prof. Robert Gilbert and graduate student *Asa Chong,* Queen's University, will study fjord sediments along the west coast of the Antarctic Peninsula, in co-operation with a U.S. team under Dr. M. Domack, Hamilton College, New York (February–March).

Prof. Wayne Pollard, McGill University, will study hydrogeological/geomorphological aspects of the McMurdo Dry Valleys. Prof. Pollard is supported by the Canadian Arctic–Antarctic Exchange Program sponsored by the Polar Continental Shelf Project and CARP.

Prof. Jack Terhune, University of New Brunswick, will study seals in the Casey and Vestfold Hills region in co-operation with colleagues from the Australian Antarctic Division. (October–January)

NEWS IN BRIEF

CCAMLR Approach Useful in Canadian Waters

As part of the evaluation for a krill fishery application on the Scotian shelf, the Department of Fisheries and Oceans invited some Southern Ocean krill experts to a workshop in Halifax in April 1997. Discussions focused on the ecosystem approach to resource management, a fundamental element in the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The Regional Advisory Process Steering Committee later recommended *inter alia* that the CCAMLR approach "be adopted for the management of forage species (existing and emerging) on the East Coast". (See report by Head, E., 1997, p. 6, in this issue.)

New Canadian Biotechnology

An emerging Canadian biotechnology/bioprocessing company is taking a strong interest in Antarctic research and resources, in particular the CCAMLR ecosystem approach to precautionary fisheries. Biozyme Systems Inc., at the Pacific Institute of Aquatic Biosciences in West Vancouver B.C., has developed a series of marine hydrolysate products that have wide application in fish rearing and specialized animal feed products, including dried and liquid products derived from krill. Biozyme is well advanced in developing an Antarctic fishery for krill, working within CCAMLR precautionary limits. They are also engaged in a wide range of R&D activities related to applications for marine proteins, pigments, enzymes, and other constituents. For further details contact: Mr. David Saxby, President, Biozyme Systems Inc. or Dr. John Spence, Research and Development. Tel: (604) 925-8074. Additional information is also available in the October 20, 1997 issue of *Forbes* magazine, p. 153.

Polar Code

The International Maritime Organization (IMO) seeks to establish an International Code of Safety for Ships in Polar Waters (Polar Code) that will harmonize existing national codes and develop unified ship construction requirements. Some countries, including Canada and Russia, have well-established national codes, but they differ in several aspects and were all designed for Arctic waters. The new code will apply to polar waters in both the northern and southern hemispheres. The Prairie and Northern Region of Transport Canada (e-mail: santosv@tc.gc.ca) plays an important role in the harmonization process.

RADARSAT Antarctic Mapping Project

The first complete radar image coverage of the Antarctic continent was successfully completed over an 18-day period in October by the RADARSAT mapping project. The imagery—some of which has been described as "stunning"—will now be turned into a mosaic map of the continent. Scientists will also study the imagery to extract information about ice-flow, geological structures, and other details. (See note re "RADARSAT Mapping" under "OPPORTUNITIES", p. 6 of this issue.) A repeat coverage of the ice cap, which will make it possible to identify changes to the ice sheet, is to be obtained in approximately two years' time. Project images are available for viewing on-line at *http://radarsat.space.gc.ca/ENG/AMM/menu.html.* (See also *CARN Newsletter* No. 4 for additional information.)

Canadians in the Ross Sea

When Dr. William Cochlan, University of Southern California (originally from Powell River, B.C.) studied the carbon cycle in the Ross Sea late last australl fall, he was joined by three other Canadians onboard the *US R/V Nathaniel B. Palmer*. The others were: Zanna Chase, Columbia University (from Montreal), Dr. Mary Lynn Dickson, University of Rhode Island (from Nova Scotia), and Tom Hayden, University of Southern California (from Saskatoon). *(From the newsletter of the Montreal Antarctic Society.)*

Canadians to Cross Antarctica

Canadian polar explorers Laurie Dexter and Synniva Sorby plan to become the first male–female team to ski across Antarctica. Starting from Brekner Island, the pair plan to arrive at the South Pole on New Year's Day, 2000, and continue on to McMurdo Sound. Dexter, of Fort Smith, N.W.T., is a veteran of the Polar Bridge Expedition that crossed the Arctic Ocean in 1988. Sorby, of Los Angeles, was born in Norway, grew up in Montreal, and graduated from Bishop's University where she was a prominent member of the ski team. She was a member of the Women's Antarctic Team that skied to the South Pole in 1992–93.

Canadian Puts Antarctica on Stage

Inexpressible Island, by Canadian playwright David Young, ran in Toronto during September–October 1997 with excellent reviews. The play is based on the story of the six-man "Northern Party" of Scott's 1912 South Pole Expedition. Led by Lieut. Victor Campbell, the party was forced to winter over in an ice cave on Inexpressible Island. In 1922 Lieut.Campbell settled in Newfoundland where he lived until his death in 1956.) For further details see *Maclean's*, October 6, 1997, p. S13.

CARN Newsletter

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