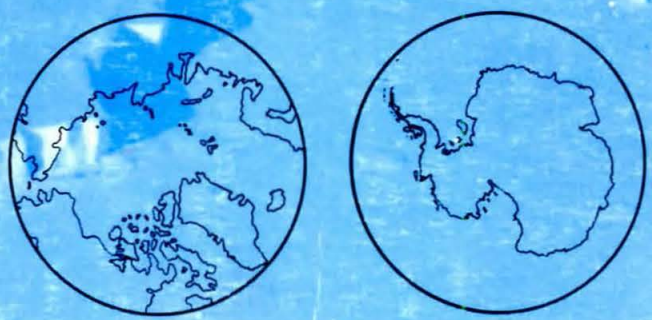
Bipolar Information Initiatives

15th Polar Libraries Colloquy

Edited by
D W H Walton, W Mills, C M Phillips



BI-POLAR INFORMATION INITIATIVES: THE NEEDS OF POLAR RESEARCH

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PROCEEDINGS OF THE 15TH POLAR LIBRARIES COLLOQUY

JULY 3-8, 1994

CAMBRIDGE, UK

Edited by D W H Walton, W Mills and C M Phillips

Published for Polar Libraries Colloquy Steering Committee by Bluntisham Books

1995

This Report is published by: Bluntisham Books, Oak House, East Street, Bluntisham, Huntingdon, UK. PE17 3LS

Copies of this Report may be obtained from: William Mills, SPRI, Lensfield Rd, Cambridge, UK. CB2 1ER

ISBN: 1 871999 06 5

Printed by Victoire Press Ltd, Bar Hill, Cambridge

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Introduction

The information revolution continues to gather pace all over the world - and that includes the polar regions. There are increasing demands on information providers to deal ever more effectively not only with the traditional library and archive materials but also to harness the data superhighways such as Internet. For polar librarians there are additional problems of remote document delivery, small groups of widely dispersed customers, acquisition difficulties, and literature in a wide variety of languages. Under these circumstances the Polar Libraries Colloquy is a necessary, even essential forum for information interchange and discussion.

This year's meeting in Cambridge was innovative in a number of ways. Firstly, it tried to focus on bipolar information requirements, looking for commonality in problems and solutions. Secondly, the poster session comprised a more important part of the meeting than in previous colloquies, instigating some stimulating discussions. Thirdly, the availability of new technology allowed the demonstration of some of the latest software tools. Fourthly, the attendance increased to 88 people from a record 17 countries, and lastly, the Colloquy finally agreed a more formal structure and constitution for its future management.

The differences between the polar regions were reflected more than their similarities in the geographical distribution of papers, and in the information objectives identified for the two areas. It is true that scientists in both the Arctic and the Antarctic need very similar types of information but the methods of acquisition and the extent of bibliographic treatment differ considerably. The Arctic with its native peoples, its economic infrastructure and its national cultures has a much more extensive and diverse literature and its information demands are met in different ways to those of the Antarctic. In this Colloquy we learnt about travelling libraries to service minority groups, delivery of health science data to rural practices, the developments of genealogical data tools and the importance of oral history projects to native people - all features of the Arctic.

Yet there were some important areas in common. Are there fields which are not adequately covered by collection policies? In this context we heard about the unrealised potential in juvenile polar literature, both as an indicator of changing cultural values and as a source of artistic illustrations. How many libraries actively acquire such material?

Are collection policies resulting in serious overlap in acquisitions between major libraries? This has been impossible to check until recently but from analyses of PolarPac we now know that there is surprisingly little overlap between four of the largest polar libraries in the world. This identification of the very extensive unique holdings in each of these libraries suggests two things: first, a worrying lack of backup if copies of many titles are lost and second, the importance for users of looking outside their principal library for adequate subject coverage.

Are library users capable of using the resources available to them? We heard about a wide range of tools and initiatives - PolarPac, NISC disk, SPRILIB mark 2, ancestors database, full text databases, listservers and gophers etc - but are the users able to find their way through the maze? Some evidence suggests that not all are equally able and a continuing and growing educational need was identified.

The problems associated with acquisition were identified in several ways. Acquiring Russian literature has never been easy but the recent economic and political changes have made it almost impossible without local purchasing. Even then the shortage of cash in Russia has meant that many titles are published in such small numbers that copies are unlikely to be acquired by Western libraries. This is a huge new lacuna for Arctic information. Equally difficult is the acquisition of grey literature for both the Arctic and Antarctic. More co-ordinated and widely disseminated searching is needed to improve in this field. A particular subject area, tourism, was used to demonstrate how important such grey material can be in commercial fields and how difficult it still is to bring together specialist bibliographies in interdisciplinary fields.

A special session on information technology allowed interactive demonstrations of the new STAR database at the Library of Congress, the Polar Libraries Gopher and the ICAIR Gateway to Antarctica accessible through Internet and the World Wide Web software. These new tools are rapidly becoming indispensable to many polar librarians but they are only as good as the cataloguing in the databases themselves. To provide the other side of the reality coin we also heard about current archival projects in Germany, Canada , the USA and the UK covering everything from the entire archive of Admiral Byrd down to the value of ships logs in documenting climate change.

Alongside the formal papers and posters there were plenty of opportunities for other activities. An outing to the National Maritime Museum allowed the participants not only to sample one of the most interesting museums in Britain but also, thanks to the library staff, enabled us to see some of the special polar

documents housed there. There was an introductory lecture on historic Cambridge, a meeting of the US Polar Information Working Group, a showing of historic polar films from SPRI and BAS, and an auction to raise funds in support of attendance at future colloquies of delegates from countries with foreign exchange problems.

Of considerable significance was the adoption at the Business Meeting of a formal constitution and structure for the Colloquy. This had been under discussion since 1988 and it was not without further debate that the constitution drafted by the working party established at Rovaniemi was finally accepted in a substantially amended form. The Colloquy now comprises a formal entity with a known membership, a crucial requirement in some countries if its meetings are to be grant aided and if its recommendations are to be given weight. Despite this we are quite sure that the informality of its meetings and the strong personal ties that underlie many of the most successful co-operations will not be changed.

This volume contains the text of all the papers and posters presented as well as the meeting programme, a full account of the Business Meeting, the new Constitution and the names and addresses of all participants. The editors found the provision of text on disk a major advantage and suggest that it should be a requirement at future meetings.

Are polar libraries really that different to other libraries? Is the Colloquy really essential to the development of polar information? Looking back over the 15th Colloquy we conclude yes to both the questions. Of course the information from and for the polar regions is not different in kind from anywhere else but the requirements and objectives of the user community are, and for that reason polar libraries are essential. Where else but at the Colloquy could initiatives such as PolarPac, resource sharing for cataloguing, library acquisition policies etc be formulated, discussed and implemented? The Polar Libraries Colloquy, established in 1971 as the Northern Libraries Colloquy, has thrived, developed and evolved over the past 23 years to accommodate the changing requirements of the polar regions. We all look forward to a further step down this path in 1996 at the 16th Colloquy in Anchorage, Alaska.

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Acknowledgements

The success of any meeting is dependent on sufficient funds, adequate organisation, an exciting programme and enthusiastic participation. We were fortunate in having all of these things.

The local organisers would like to thank Dr John Heap (Director, SPRI) and Dr David Drewry (Director, BAS) for their stimulating lectures, the use of the facilities at SPRI and BAS and the financial support offered. Harry King provided just the right introductory touch with his lecture on historic Cambridge.

Three Russian delegates were funded by the International Science Foundation and one by University of Alaska Fairbanks. We thank ISF and UAF for their generosity, and Jerry Brown and Sharon West for their assistance in obtaining these grants. No Colloquy would be complete without Russian representation and the problems of acquiring Russian material, referred to above, would certainly be significantly more intractable without the personal contacts established through the Colloquy.

We wish to thank especially Paul Murphy, Val Torpey, Diane Saxon, Chris Gilbert, Peter Bucktrout, and Carol Jones at BAS and Pippa Hogg, Shirley Sawtell, Ailsa MacQueen, Sharon Banks, Pat Little, Ron Wilbraham, Teresa Clark, Irene Burns and Robert Headland at SPRI for their invaluable assistance in many ways to ensure the smooth running of the meeting. We are grateful to the staff of Girton College, Cambridge, and particularly to Nora Smythe, for providing such a comfortable venue for much of the meeting and to Mary Shepherd and other staff at the National Maritime Museum for the trouble taken over our visit. We thank Bob Neville for the excellent reception at SPRI sponsored by Clio Press.

Finally, we are indebted to Sharon Walton for her valiant and untiring efforts in turning the varied papers and posters into the final camera ready copy of this volume.

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A theory of polar information

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Abstract: Polar science is undergoing a consequential change. Research is identifying global environmental problems. Governments are calling upon science to provide information about the future course and consequences of atmospheric change on world ecosystems. A dynamic tension exists between the need for coordinated research and the continuation of individual efforts to push the frontiers of polar science. This tension can be relieved partially through improved information flows: standardizing research procedures, while disseminating new techniques and methods rapidly; publishing data sets, not just their interpretation; evaluating information, not just finding it; information specialists, who are neither passive librarian nor active researcher; libraries need to become active participants in the coordination and assessment of information sources; using electronic networks effectively; and, developing electronic journals that employ virtual peer review and are not copywritten. These changes are more crucial for polar areas than for other parts of the world. Global environmental changes may be greater. Resident and research communities are remote and face greater difficulties in communication. Research plays a far greater role in public policy and economic activities.

Key words: polar information, polar research, electronic networks, data evaluation

Introduction

Words have always passed slowly in polar regions. This thoughtful pace was not a problem before World War II. During the war, and the Cold War that followed, Arctic areas grew more important to national security and economies. Research became an important tool for national policies in Arctic regions. The resulting information played a far greater role in public policy and economic activities than in other areas of the polar nations. Information became fraught with economic, political, legal and moral implications. Remote and dispersed, slow to receive new technologies, Arctic residents did not know what was written about them. They felt the connection between research and political power, yet did not know how to become part of it.

Research has also played a major role in the status of Antarctica. The research community, while still dispersed, has been more cooperative. Antarctica lacks an indigenous population. Its military and economic importance was slight enough to allow an international agreement that it remain unmilitarized and unexploited. Researchers have still had to deal with the problems of identifying existing information and obtaining it.

Polar researchers and residents have shared with other areas this problem of simply finding out what information exists. But, isolation and the importance of research to management exacerbated the problem. The last 15 years have seen tremendous advances in polar information access. It is possible to sit in Hamilton, New Zealand and scan databases in Rovaniemi and Fairbanks. One can send e-mail to a department chair who is in an Antarctic field camp studying Dry Valleys. Research papers can float electronically around the world before they are ever considered for print. The polar researcher now confronts a new problem: information inundation.

With improved access, polar libraries and information services have successfully addressed the first problem of polar information: identifying and making available knowledge about the Arctic and Antarctic. While it is too early to declare victory, significant progress has been made. Progress has not been just a matter of new technology, but of seeing how it could be used.

The demands on polar information are changing. These demands do not result just from changes in research, but from changing international perceptions of polar areas and increasing speed in communications. The new importance of and demands on the *findings* of polar research suggest that polar information has ceased to be a passive derivative. New communications systems also change who can participate in the research, and who can use its results.

Polar information needs a theory, a guide by which to bring order out of chaos. Information has a role to play in its own right. An idea of what is essential must guide that role. The theory of this paper is that information services must actively participate in two aspects of information (1) determining the quality of information, not just seeking quantity and (2) making the transition from physical to electronic circulation. Information services need to become active participants in the

coordination and assessment of information sources. Instead of storehouses of knowledge, they must look at "just-in-time" delivery.

The next problem

Increasing reliance is being put on research to answer important questions. This reliance in turn lays stress on the value and reliability of information. We can address this through: evaluating the significance of information; creating comparability and complementarity among research studies and their results; identifying and filling knowledge gaps; and incorporating the knowledge of indigenous northern residents.

The need for evaluation arises from several trends: the part that polar research is playing in international questions of global environmental change, the information overload, the development of international polar agreements and business ventures, and politically active indigenous populations. Now, knowing what exists, the question becomes, "What is really important?"

Global environmental change

Governments are calling upon science to provide information about the future course and consequences of human activity on world ecosystems. Research has identified two global environmental problems with major consequences for polar areas: global warming and stratospheric ozone depletion. Global climate warming will be the greatest in the Arctic, and the Arctic ecosystem may have the greatest difficulty in adapting. The ozone depletion is greatest over Antarctica.

A third area is not as well recognized. Though sustainable economic development is a global concern, attaining it in the Arctic and sub-Arctic presents unique challenges. Policymakers are looking for scientific foundations to sustainable use management regimes. Those foundations will be particularly difficult to find in the Arctic.

Global environmental problems cannot be left to random research or to the sociology and psychology of individual academic institutions. They demand integration both in terms of the research objectives and the geographic distribution of researchers. Coordinated research efforts, even in the unsociable social sciences, are becoming the norm.

International agreements and business ventures

The year 1991 saw international agreements on both the Arctic and Antarctic. In these agreements, the environment was a central concern. Environmental agreements previously existed for the polar areas, but they concentrated on single aspects, usually species, of the ecosystems. The new agreements cover much larger topical areas and require formal international research efforts. Both the original Antarctic Treaty and the recent Protocol for Environmental Protection emphasize science as the primary human activity on the continent.

Changes in the former Soviet Union have led to new opportunities in business. These include developing the oil and gas fields of Russia for export to the West and the Northern Sea route. Research is playing a role. Governments are requiring environmental impact assessments of business ventures. Both the environmental agreements and the trans-boundary environmental assessments require that the data be comparable and equally reliable.

The environmental assessments frequently build on existing studies. The task is finding those assessments, understanding their combined implications, and identifying areas for further work. These three steps describe the assessment research on the Alaska side of the proposed Northern Sea route because a major body of work already exists in association with off-shore oil and gas development.

While governments and corporations had previously been the major actors in these international activities, new ones have emerged. Non-governmental organizations (NGOs) have become particularly active. They are producing their own research reports and policy conclusions. They are also becoming participants, direct or otherwise, in international negotiations. Indigenous groups are prominent among these NGOs.

Nowhere is the importance of relevant policies more obvious than in the increasing involvement of northern indigenous populations in resource management. They want to know how research might affect them, what science underlies decisions and what results to expect. Seeing that governments justify decisions with scientific claims, native northerners are seeking recognition of their knowledge. In the accord signed at the Second Ministerial Meeting on the Arctic Environment in Nuuk, Greenland, indigenous knowledge became a recognized part of the international Arctic monitoring effort.

Developments in research

The development of a global electronic communication network, the Internet, has been the backdrop to these changes. In developing a coordinated research program, in gaining access to information, or in participating in discussions about environmental questions, suddenly the flow is almost instantaneous. The consequences of this free flow are only now becoming clear (Lewis 1994). The system has broken down previous hierarchies. Information on the network has become a *vox populi*. Governments are finding that news of events in their hinterlands becomes known worldwide before they can learn of it themselves. The question now becomes how

to use the freedom and speed of the network, yet not become buried in garbage.

It is worth mentioning three developments, in what constitutes research and its dissemination,which are the result of the trends discussed above:

- monitoring is becoming an end in itself;
- standardizing research procedures is becoming necessary, but innovation outside of standardization must still take place; and
- the circulation of data sets, not just their interpretation, may become more widespread.

Monitoring

Monitoring has become important for two reasons. Many polar systems, including social systems, lack practical predictability. Decision-makers are not always looking for predictions, but they do want to avert problems before they are out of control. Thus, judging the exact impact of oil development on a remote community may be difficult, but knowing what are likely to be the problems and when they will develop may still be important. Monitoring addresses the latter task.

Monitoring also provides an intermediate step between doing nothing and doing something in international environmental regimes. Polar countries can say that they are doing something about a problem without directly addressing it. This claim may be made for the Arctic Environmental Protection Strategy (the Rovaniemi Agreement) and the Arctic Monitoring and Assessment Program (AMAP) that came from it.

Monitoring has three information characteristics. Data sets must be consistent both through time and across space. The information must be timely and current. Finally, monitoring studies do not fit into mainstream academic or even government publications nor, very often, into research funding regimes. They may require new approaches to evaluation and dissemination.

The data may also provide new opportunities for research. If they become part of public information, researchers, northern residents, and others can tap into them. The users can draw their own conclusions, or understand how conclusions were reached.

Data standardization

Global studies require coordinated research or the combination of data sets from related studies. The comparability and underlying quality of the data are a central question. In cooperative research studies, this question may mean developing quality control systems that feed back to the researchers. This iterative system would allow for improvements in data as the research continues. It also will add another type of information, the assessments of the data sets.

Another issue concerns the dynamic tension between coordinated and innovative research. Coordinated research is needed for answering global questions. Yet, innovation comes not from these kinds of projects, but from the work of individuals. This tension can be relieved partially through improved information flow. If individuals can be informed about the general thrust of research efforts, they can contribute to improvements in the approaches used. Simultaneously, those in charge of research projects need to know about innovations that affect their work.

Data sets

As governments become involved in monitoring and assessment, the data generated in such studies will become public. Sharing data sets may be more frequent, even with private researchers. Electronic communications have lessened the difficulties. With a greater emphasis on collaborative research, or research based upon combined data sets, recognition among peers may encourage greater sharing. The public availability of data sets will allow for second party evaluations and aid research that combines the results of different studies. Information services will need to look at how they can help the flow of these data. Long term, they may be as important as the flow of finished studies.

The future of information

These changes in information use, users, and distribution lead to two observations about the future:

- a need not just to find information, but to evaluate it; and
- a need to improve the effectiveness of electronic networks.

Evaluating information

Answering policy questions requires identification of essential information, determination of information reliability, and identification of information gaps. Policy questions cannot ignore the quality of information. Information, when used to justify public decisions, can become a political issue.

A good example of information assessment in solving environmental management problems may be found in the quota management system (QMS) for fish. Governments throughout the world are instituting QMS's, particularly in the wake of fish stock collapses. In the system developed by New Zealand, fishing companies own the right to a percentage of the total allowable commercial catch (TACC) (Parliamentary Commissioner for the Environment 1992, 14-35). By law, the TACC must be set at a sustainable catch level. The quota holder is supposed to become a willing participant in the system because he owns equity in a fishery with a stable income.

The system is, however, based upon research. The sustainable catch level must be set through evaluations of the fish stocks and knowledge of the species' population biology. The Ministry of Agriculture and Fisheries (MAF) in New Zealand is responsible for setting the quota based upon the recommendations of its

scientific staff. According to a MAF scientist, there is only sufficient scientific information to guarantee sustainable management for six of 160 or more commercial species (Anon 1992). In fact, the fisheries science literature seems to lack any consideration of how to decide when enough knowledge exists to manage a fish stock.

Information assessment is probably the most essential new role in information services. As the sheer volume of information increases, finding the essential becomes a necessity. Presumably, coordinated research projects will provide internal evaluations. A need will still exist for evaluating independent research and prior studies.

Between the researcher, who generates new material, and the traditional librarian, may stand the person who either assembles assessments or undertakes them. Assessments can be conducted in several ways: peer review, consistency tests, modelling to understand the implications of the information (Committee on the Applications of Ecological Theory to Environmental Problems 1986, 108-109), or measurements of the data's uncertainty (Morgan & Henrion 1990). Research institutions in general do not fulfil this role. Academic reward is for completing new research rather than reviewing old. Information services, by default, may be required to fill the assessment role.

Effective use of electronic networks

Up to this point, electronic networks have enhanced traditional information flows, but their full potential has only begun to be realized. The Internet discussion groups are already alternative sources of information. When someone declares that these discussions are peer review and gives them a more formal character, they could replace printed journals.

A greater use of electronic journals that employ open peer review and are not copyright protected would be a fundamental way of improving scientific discourse and increasing the participation of northern residents. Peer review is an essential element in evaluating research and allocating resources. The system is dependent upon the quality of the reviewers. Good reviewers are slow because they are overworked. Other reviewers may be quicker, but their evaluations may miss the point. No where is this truer than in the social sciences where core theories are lacking. A system of open review, in which an article continues to be reviewed after it has become 'public,' could be one solution. Information specialists could not only give people articles, but the accompanying discussion. The job of assessment would be much easier. An open review process could also include native northerners, who would then be more deeply involved in research and its analysis.

Copyright was intended to protect the economic interests of authors and publishers, and thus encourage publication. Yet most academic authors receive no compensation. Electronic circulation could avoid the need for publishers. Copyright prevents the wider distribution of material in northern areas(at least legally). Electronic mailings would also overcome the problems that take place in physically mailing printed material.

Finally, a rapid means of making work public is important with respect to global monitoring. The remoteness of polar regions makes it less likely that developments will be known outside. One cannot find out what is happening in Kirkenes, Kotzebue or the Kola without going there. Northern communities are not likely to be the objects of national news reports. Without immediate information and feedback, the best intended decisions can cause problems.

Conclusions

Under the developing shape of global research, information is becoming, if it is not already, an end in itself. Rather than the passive result of scientific discovery, information can be the objective. This new teleological situation reflects its use in decision-making and the consequences those decisions have. Where knowledge is lacking, the impact of that gap on possible decisions must be recognised since the quality of decision-making depends on the quality of data. Scientific and indigenous knowledge, rather than politics, can only play a role if they can show better outcomes.

Polar information, thus, has an increasing role to play. Whether the role is *ad hoc* will depend on whether polar information specialists develop clear ideas about what needs to be done and who is going to do it. Access became better because of a clear vision. Now it is time to address the information inundation itself.

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Are we information poor? Limitations to accessing polar literature

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Abstract: The several library catalogues and reference databases published on the *PolarPac* and *Arctic & Antarctic Regions* CD-ROMs have been analyzed with grant support from The Council on Library Resources (CLR). Results show that approximately a third of the polar literature currently lacks effective bibliographic control. At the same time, there is a high incidence of duplicate accessioning. The "citation gap" resulting from lack of coverage is primarily a function of document type, rather than of scientific discipline or particular geographic area. Technical reports, book chapters, conference papers, dissertations, maps, and articles in "non-polar" (discipline oriented) journals, are less likely to be selected for indexing than articles in peer reviewed polar regions journals. In order to expand upon this finding, further research, based on the Institute of Arctic and Alpine Research (INSTAAR) Publications List for the past 25 years, was undertaken. The results of this study indicate a shift in publication type away from technical reports and toward "non-polar," peer reviewed journals. The process of reducing duplicate indexing by distributing responsibilities between database producers is presently being addressed. The process of achieving true bibliographic control over the polar regions literature must also be addressed. Discipline oriented journals, and non-journal document types must be scanned regularly for polar regions information. Improved coverage of the literature, which is on the verge of escaping bibliographic control, will benefit the entire international user community.

Key words: Literature -- polar regions, information management, publishing

Introduction

Are the polar regions abstracting and indexing services selecting and indexing enough polar regions publications to claim bibliographic control over this literature? This issue has been discussed and written about in association with the Polar Libraries Colloquy for over twenty years.

Four years ago at the 13th Colloquy this author (Andrews 1990) presented a conceptual diagram illustrating the notion that the abstracting and indexing services are providing duplicate coverage of a portion of the polar regions literature which is approximately equal to the amount of the literature that is not being covered at all. Since that time I have been able, through a grant from the Council on Library Resources (CLR), to quantify the incidence of duplication and overlap of the databases provided on *Arctic & Antarctic Regions*. I have also analyzed the Institute of Arctic and Alpine (INSTAAR) publications list to expand on the findings from the CLR project.

At present, through the use of Internet, and the willingness of database producers to cooperate and distribute responsibilities, duplicate coverage is being reduced. However, the issue of expanding coverage to include materials not presently indexed by any of the polar regions databases is still needs to be addressed.

The Council on Library Resources Project

The systematic research undertaken for the project "Distributing responsibilities for accessioning and indexing polar regions information," (Andrews 1993) resulted in the specific identification of problem areas associated with both overlapping coverage, and lack of coverage, of the polar regions literature. Prior to this research, these problems were only generally known, and the several studies done were difficult to compare with each other (see Andrews 1993 pp. 13-15). Recent technological advances have resulted in storage of electronic databases on CD-ROM. The polar regions literature is represented on two specialized CD-ROMs: *Arctic & Antarctic Regions* (NISC 1989-) and *PolarPac* (WLN 1990-). The global search capabilities on the CD-ROMs allow a level of comparability between databases which was very difficult to achieve in earlier studies.

Coverage by the databases included on these CD-ROMs is remarkably comprehensive, and access is user friendly. However, there is a high incidence of overlap in the materials selected by the various producers whose databases are on *Arctic & Antarctic Regions*. At the same time, coverage is lacking for a high percentage of published information which could reasonably be expected, because of its polar regions orientation, to be indexed on one or the other of the two CD-ROMs.

Public and private resources are being diluted by duplicate efforts, while the user must seek additional access sources which are not easily identifiable and/or available. Improved service to the users of the polar regions databases should be an important goal of polar information providers.

To achieve the project goals - 1) to reduce the overlapping bibliographic coverage of polar regions literature by the major indexing services, and 2) to expand coverage to include document types not currently selected by the indexing services - a thorough analysis of coverage by the databases brought together on the March 1991 and May 1992 editions of *Arctic & Antarctic Regions* and of Issue 2 (1991) of *PolarPac* was undertaken using statistical data derived from the discs, and statistical data supplied by WLN.

Duplication of coverage

Overlapping coverage between databases published on the December 1992 edition of *Arctic & Antarctic Regions* has already been established to some extent by the use of compositing software by the publisher. To identify this duplication more specifically, I established a routine using INMAGIC and Excel software. Eighteen polar regions journals were selected and tested for coverage by all five databases - COLD, SPRI, ASTIS, C-CORE, and WDC-A - globally searchable on *Arctic & Antarctic Regions*. Overall, of articles published in 1988 by these eighteen journals, 331 articles were selected and covered 638 times (1.92 times each) by the five databases. COLD and SPRI had both selected 145 of the same articles. Due to this high incidence of duplication, COLD and SPRI were chosen for further comparison. The producers of both COLD and SPRI are now, as they have been in the past, aware of their duplication of effort. With the availability of COLD on Internet, allowing real time access, both producers now have the mechanism to cooperate and distribute responsibilities for coverage. This cooperation will be discussed further during this colloquy.

Lack of coverage

The polar regions CD-ROMs were next analyzed to determine their effectiveness for retrieval of a wide range of subjects that could reasonably be expected to be found since they all represented scientific research conducted in the polar regions. Resolution of this issue is probably even more important than the issue of duplication. A checklist of 630 titles was compiled from reference lists of fifteen review papers on polar regions topics. Of these 630 titles, 266 were not found on *Arctic & Antarctic Regions*, May 1992 edition. When only these 266 titles were searched on *PolarPac*, 49 were found. Further analysis of the 266 titles not found on *Arctic & Antarctic Regions* shows that approximately 20% each of technical reports, theses/maps/abstracts, book chapters/conference papers, and "non-polar" journal articles are not indexed. Of the 49 records (of the missing 266) subsequently found on *PolarPac*, 32 were technical reports, and the other 17 were scattered almost equally among the other categories.

The 364 found items (630 minus 266) were indexed a total of 746 times. This number is comparable to the 331 articles (overlap, above) having been indexed 638 times. It gives weight to the notion that if resources were reallocated that the effort consumed in duplication could be used to expand coverage to a very satisfactory level!

The INSTAAR study

More than a third of the polar literature currently lacks effective bibliographic control by the several library catalogues and reference databases published on *PolarPac* and *Arctic & Antarctic Regions*. As indicated, this "citation gap" is primarily a function of document type, rather than of scientific discipline or particular geographic area. Technical reports, book chapters, conference papers, dissertations, maps, and articles in "non-polar" journals are less likely to be selected for indexing than articles in peer reviewed polar regions journals.

In order to expand upon this finding, further research was undertaken by this author using the INSTAAR Publications List for the past 25 years (1968-1992). The Institute of Arctic and Alpine Research brings together scientists working in a variety of disciplines relevant to the present and former cold regions of the world. Geology, climatology, and ecology are studied with an emphasis on Arctic and alpine regions, and the Quaternary period.

Analysis of the INSTAAR publications list 1968-1992

This list of 1301 publications is kept as a searchable database using INMAGIC software. The SOURCE field for these 1301 publications was listed and analyzed to show the breakdown of document types chosen for publication by a typical group of polar researchers. Of the 1301 publications, 634 (48%) appeared in journals. Of these 310 (24% of 1301) were in "polar" journals, and 324 (25% of 1301) were in "non-polar" journals. It is interesting to note that less than half of all publications were in journals at all! The remainder of the publications were in the following document types: 286 (22%) in technical reports; 273 (21%) in book chapters or conference proceedings, and 104 (8%) miscellaneous (maps, abstracts, etc.).

Several differences prevent direct comparison between the INSTAAR and CLR findings. The INSTAAR list does not include theses, only one map has ever been reported as a publication, abstracts were listed only occasionally, and since the list was started in 1968 publications older than 1965 do not appear! Nevertheless, both sets of numbers include the same, larger, categories of

publication: "non-polar" journals, technical reports, and book chapters/conference proceedings.

Clearly it was not feasible to check all 1301 publications from the INSTAAR publications list against *Arctic & Antarctic Regions* to make a valid comparison. However, I did check several dozen titles from the list which were in the "at risk" document types (i.e., all types except for "polar" journals). Book chapters seemed to be well covered. The same was not true for articles in "non-polar" journals, for example, *Geology* and the *Geological Society of America Bulletin*, even though their titles contained words like Baffin Island, Greenland, Antarctica, and glaciation!

Analysis of the INSTAAR publications list: 1988 and 1992

To investigate possible choice trends in document types selected by authors for their publications, I analyzed source lists for 1988 and 1992. The 1988 list shows approximately the same % of publication in polar journals, but an increase in publication in "non-polar" journals, mainly at the expense of the technical reports when compared with the 1968-1992 list. This resulted in 60% of the total publications appearing in the journal literature, as compared to 49% overall between 1968 and 1992.

The 1992 list also shows the percentage of polar journals publications to be fairly constant, but "non-polar" journal publications have increased significantly and no technical reports were published. By 1992, 70% of all publications appear in journals, as compared to 49% overall and 60% in 1988.

The pattern derived from analysis of the INSTAAR Publications List shows the following:

i. publication in polar journals remains fairly constant;
ii. publication in books and conference proceedings remains fairly constant;
iii. publication in discipline oriented journals increases significantly, and
iv. publication in technical reports declines dramatically.

The breakdown of document types chosen for publication by one group of polar researchers cannot be considered definitive. However, the INSTAAR study shows a pronounced shift toward publication in discipline oriented journals at the expense of publication in technical reports. These results make it imperative for the polar regions database producers to increase their scanning of "non-polar" journals in their quest for bibliographic control over the polar regions literature.

Summary and recommendations

The producers of polar and cold regions databases are presently doing an excellent job. In fact, these information providers are leaders in the field of information provision to specialized clientele. However, selection and indexing policies assume a different level of importance in a globally searchable format. The polar regions CD-ROMs are being used by an international user community whose needs must be met. Improved bibliographic control of polar regions information is vital because this information forms the basis for policy and management decisions, further polar regions research, and planning data for residents of the northern circumpolar region.

The results of the CLR project demonstrate that the peer-reviewed journals publishing mainly polar regions material are very well covered by the major reference databases; in fact there is considerable overlap in the coverage. On the other hand, discipline oriented journals, and non-journal document types, are not covered well at all on the CDs, leaving the user to search for valuable research materials through other channels.

The results of the INSTAAR study confirm the increasing importance of the discipline oriented journals as vehicles for publication by polar regions researchers. These results show competition for the long held notion that the "grey literature" was the most elusive of polar regions information!

It is therefore recommended that the producers of polar regions databases further increase their surveillance of publication types outside of the traditional polar regions journals. The members of the Polar Libraries Colloquy should all be prepared to help in this endeavour in whatever ways the database producers deem appropriate. It is our information and our user community which must be brought together as effectively as possible.

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The information needs of polar library users

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Abstract: We need to question if library organisation aids or hinders users. There appears to be little research or data on how users choose libraries, the relative importance to users of various services, or measures of success in patron satisfaction.

Key words: library organisation, user expectations, use studies

Introduction

Who uses polar information? How do they find that information? Has your library studied how your patrons access materials? What has experience taught you about user behaviour that you have not seen documented anywhere?

It is due to Hubert Wenger's interest in Arctic information that I came to understand his concern about how users find information. Hubert and his wife Beatrice's curiosity to learn about Eskimos has taken them to many libraries around the world and has resulted in the recent release of a CD-ROM full-text database on the first-contact literature on Eskimos with non-Eskimos entitled the *Wenger Anthropological Eskimo Database*.

While using our University of Alaska Fairbanks library collections, Hubert observed how libraries seem to be set up for librarians and not necessarily for researchers. I initially surmised that library systems are required to be systematic across many disciplines and through generations of time because their internal integrity is critical, even if the system baffled some users (and created jobs for reference libraries?). However I wondered if what he said was true that users find things in spite of the way libraries organise information.

Investigating user behaviour

As the editor of the online Bibliography of Alaska and Polar Regions which provides article level access to periodicals received at the University Library, I wondered how users are able to find materials. We index over 6000 articles annually with a 24 hour turnaround, and we need to ensure researchers use us!

Over the past year I informally queried users about how they find materials. Our users research experience range from none to those who know particular sections better than staff. In terms of behaviour our library users fall into three categories: 1) those with curiosity and motivation who are eager to learn how to find things, but lack specific experience in our collection; 2) those who are the top in their specialities and who seldom enter the library or dispatch graduate students to do the research and 3) those who hate or dislike libraries but need answers for tests and papers.

As Alaskan library professionals we are now better trained to assist all these categories of patrons. Through recent state-wide STAR training we can now deftly broaden or narrow requests by asking "Can you be a bit more specific?" Use paraphrasing for precision "As I understand your question, you want to know..." And provide for continuing service opportunities by ending with "Does this answer your question?"

More seriously though, I reviewed library journals, proceedings, and found little addressing user behaviour except for Martha Andrews survey at the Institute of Arctic and Alpine Research Library discussed in the last Colloquy proceedings (PLC 1992). But there are unanswered questions about for example how we should deal with periodicals also indexed in other databases. Should we really expend time duplicating what already exists?

Many of patrons use us because we are convenient, and the searching is identical to what they are using to find monographs. They would perhaps not use us if we were in another database which would require another log-on or another searching procedure or at another physical location.

As budgets for libraries become tighter it is essential to ensure that those primary elements of user motivation are not chopped in the quest for efficiency or cost-cutting. Interlibrary loan, periodical loan services from regional centres, on-line services from information vendors - all these are affecting how users use us, or choose not to use us by going directly to the sources of electronic publishing. Are libraries becoming pit-stops on the electronic information highway, with librarians directing traffic to the ramps? Will librarians soon preside over dead collections while patrons go directly to the publishers for their materials via the Internet, credit cards and faxes?

During the last Alaska Science Conference in Whitehorse and the Inuit Studies conference in Iqaluit, NWT, I participated in sessions dealing with libraries and northern information. In Whitehorse some of the participants regularly used *PolarPac* and electronic databases but most did not. In Iqaluit of the 25 people in the session, most were familiar with Internet and regularly used databases. One-third knew of *PolarPac* and one quarter knew of the Arctic and Antarctic Regions Database (the NISC Disc). The Science and Inuit Studies conference showed how divergent are the "information rich" and the "information poor"

Who uses databases depends on what is available and how user friendly it is. With increasing numbers of databases now available and more searching engines, will unfriendly software keep users from finding the information we think valuable? Are we marketing our wares effectively so researchers know where to find polar information? What has been your experience in working with students, scientists, and researchers seeking polar information?

The future

I believe that library user behaviour could be a discussion topic at the next Colloquy. While we may not have time to conduct rigorous studies, we can at least learn from each other. Questions we might ask are:

- Does your library have hard or anecdotal information about user behaviour around which you have designed your services and materials?
- How successful are you in serving your patrons
- Do you know who is not using your collection and why?

Arctic "know-how" at the University of Lapland

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Abstract: The University of Lapland, founded fifteen years ago, is a young and dynamic institution. Its task is to become one of the leading sources for information on the Circumpolar North. The overall activities of the Arctic Centre's multidisciplinary mission as part of the University of Lapland is to assess, understand and communicate the effects of global changes on the Arctic environment and Arctic society. As part of the Arctic Centre's activities, the Data and Information Services Unit (AC/DIS) strives to be a gateway to existing information. The main emphasis at AC/DIS is on serving as a gateway to Arctic "know-how" by maintaining its own databases for online access. The faculties of the University of Lapland concentrate on social sciences and related sciences. The main goal of the university is to promote multidisciplinary research within the field of social sciences. The University Library is starting to collect databases of research done at the University for online access. The software will be the same as used at the Arctic Centre.

Key words: bibliographies, databases, information services, Arctic research.

What's going on at the Arctic Centre?

The Arctic Centre is a young institution founded in 1989. However, the Arctic Centre is highly respected as the national institute in Finland dealing with Arctic affairs including assessing, understanding and communicating the effects of global changes on the Arctic environment and society. Since its foundation the Centre has vigorously pursued an international role.

As part of the Arctic Centre's role and task, its Data and Information Services Unit (AC/DIS) provides information services for anyone requiring information about the Arctic regions. It strives to be a gateway to international Arctic and cold climate research and data rather than a collection of a large variety of publications and books. AC/DIS serves not only the scientific community, but also decision makers in politics, business, industry and the public.

Existing "tools" for providing services

To fulfil the goals and objectives of its services AC/DIS produces and maintains seven databases for online access. Currently they include:

Arctic Research Institutes: A database on 700 institutes in 31 countries conducting research on cold regions. It also includes descriptions of the research fields of the institutions.

Arctic Experts: Information on Finnish and Russian Arctic experts and their work. The Russian experts are from the Kola Peninsula area.

Cold Climate Related Studies: The database consists of information on cold climate related studies since the year 1990 in Finland and in Russia, the latter concentrating on the Kola Peninsula area. Originals and translations are available for the Russian material. The database also has information on worldwide dissertations on polar issues from University Microfilms.

Congresses: Information on congresses addressing polar issues since the year 1994 has been collected.

Reports of the International Geosphere-Biosphere Program (IGBP): The IGBP database includes studies dealing with global changes. Updating this is an AC/DIS responsibility as the Regional Information Centre for the Arctic.

Astala Cultural Collections: Printed materials and photos of music and other cultural events in the Nordic countries.

Directory of Polar and Cold Regions Library Resources: The database consists of library sources.

The software used in information retrievals is UnixMinttu and the search language can be either Finnish or English. The contents of the databases are in English except for part of the Cold Climate Studies from Finland and Astala Cultural Collections. The databases are continuously updated.

Facing the present - preparing for the future

The Barents Sea region is limited to the northern part of Norway, Sweden, Finland and the Kola area, Archangels and North-Karelia in Russia. AC/DIS databases include information on institutions with ongoing projects, experts involved with Barents Sea research and reports on Barents Sea studies. There are also many other institutions in the Barents Sea region involved with the production of other databases. The Barents Information System (BIS) has been founded in a spirit of cooperation between these institutions. It will include information on the most important enterprises, ongoing projects e.g. in research and in industry, and data from the most important geographical area. The text-oriented metadatabase will be in Gopher and World Wide Web-systems. AC/DIS databases, extended with more specific details of the ongoing projects, will be one element of BIS.

Russian scientists and their studies are not known adequately in the West. In order to improve this situation, AC/DIS is collecting Russian multidisciplinary Arctic studies for the Arctic Centre's collections. The titles, contents and possible abstracts will be translated using the translation software STYLYS from Russian into English. The translated texts will be provided with keywords and moved into the "Cold Climate Related Studies" database for researchers' use worldwide. When needed by users the publications or parts from them can be translated using the translation software. The new Russian material will be an addition to the research abstracts produced at the Kola Science Centre in Russia.

What's going on at the faculties of University of Lapland?

The faculties of the University of Lapland provide teaching and research mainly in the following fields: social sciences, law, social policy, international relations, sociology, economics, minorities, administration, women studies, environment, education, art and design, psychology, media sciences. Research in the fields represented at the University, is to a certain extent centred on the problem of northern Finland and the Circumpolar North.

Arctic studies are generally connected very closely to the natural sciences or applied to them. The University of Lapland is an exception. Its faculties are focused mainly on social issues. It pursues research about the human society on the northern and related remote parts of the country. One task of the University is to enhance the economy and the living conditions of the people in Lapland.

Research activities at the University have recently increased and are still developing rapidly with the first fifteen years now behind. The University pays attention especially to the multidisciplinary and interdisciplinary research. This kind of research usually takes place in the field of northern studies. Interdisciplinary research is highly appropriate in the fields of social sciences, and the small size of the University plays an important part in bringing forward cooperation between faculties.

Polar databases usually contains more information on natural sciences than on social sciences. The University Library of Lapland has now began to compose a database about the research activities at the University. It will comprise the following parts:

- new publications by faculty members
- ongoing research projects
- experts on social and related sciences

The compilation has been started with publications and articles of the faculty members from 1993. The software and the search language used will be the same as these used in the databases of the Arctic Centre. Both systems will be on the same host computer, and the log-in is the same. Searches can be made in one or several parts of the database at the same time by free text search or by keywords in English or Finnish. We hope that this new database will become useful to people seeking information about social sciences in the North.

The role of the IRF Library in the expanding scientific community in Kiruna - a centre for space research in Sweden

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Abstract: The research institutions in Kiruna specializing in space physics and the related areas, employ and involve about 500 people. Scientists, engineers and students working in these fields have access to the IRF library. The main research institutions in Kiruna are: Swedish Institute of Space Physics (IRF) conducting basic research and observatory measurements in space physics; ESRANGE the civil balloon and rocket range and satellite tracking facility; Arena Arctica which houses aircraft doing ozone research in the northern polar region; EISCATproviding an upper atmosphere radar facility; Satellitbild which processes satellite images; Space Engineering Education Centre which as part of the university of Umeå, accommodates 100 students and is an extension of the IRF building. Apart from these, the Cold Centre also has access to the IRF library. The library with two staff has about 6000 volumes, 200 journals and 200 data report series. There are two databases in use, ELIBRI and LIBRIS. A specialised in-house system of classification is used and divided into a 64 sub-section letter system.

Key words: Kiruna, iron ore, space physics, ozone, cold climate.

Introduction

Why is there a need for a space physics library in Kiruna; a remote mining town in Swedish Lapland, the farthest north geographical province in Sweden, above the Arctic Circle at a latitude about 68°N? To explain this it is necessary to know something about the history of Kiruna. The Laplanders, also called the Sami, were the original inhabitants of Kiruna. Reindeer herding has been the basis for their existence for many hundreds of years. Today, about one tenth the inhabitants of Kiruna are of Lapp origin and some of them still make their living by reindeer herding.

The town of Kiruna was founded as a result of the discovery of rich iron ore deposits in the area and the first building in Kiruna dates from 1890 (Brunnström 1980). The majority of the people who settled in Kiruna came from other parts of Sweden. During the 17th, 18th and 19th centuries, the iron ore was transported from the mines to the coast, 350 km south of Kiruna, by reindeer pulling Lapp sledges or by boat. In 1902 the northernmost railway in the world was opened to Narvik in Norway. The iron ore could then be transported by rail to the harbour and from there shipped all over the world.

The LKAB mining company became the dominant industry in Kiruna and today employs about 3500 people. For several decades trade and industry in northernmost Sweden have revolved around LKAB. Today the iron ore is mined underground and the work is highly mechanized. The Kiruna mine is the largest underground mine in the world with 500 kilometres of underground roadway. The mining industry will remain the base for trade, industry and employment in Kiruna for the foreseeable future.

The Aurora - the romance of the northern lights

Aurora Borealis - the Northern Lights - have fascinated man throughout the years with their magnificent light show. Even in the bible one can read about the aurora. For our ancestors the northern lights were a bridge between the Earth and the seat of the gods. Right up until our own times people believed that, through the northern lights, contact could be made between the living and the dead. The sparkling colours were a reminder of heaven and each time they fragmented man feared that the Day of Judgment was near. The nomadic population who lived and still live in the auroral zone had great respect for the aurora believing that you could call for them by whistling, but to do so was very dangerous. Science has made great strides over the past two hundred years, but as long as the northern lights play across the sky above our heads, they will continue to pull at the same lyrical strings within us - the romance of the northern light will never fade.

Auroral research today

What is the Aurora? It is all a part of a complicated interaction that takes place high in the atmosphere. A wind of electrons and ions from the sun strike deforms the Earth's magnetic field and causes acceleration of electrons to high energies at heights of a few thousand

km above the polar regions. These high energy electrons travel down the magnetic field lines into the atmosphere. There, at between about 100 km and 400 km height, they hit atmospheric atoms and molecules which then emit light. The colour depends on the energy of the electrons which determines the exact height from which the light is emitted. These Northern Lights and the Southern Lights can only be seen from the ground under certain circumstances - it must be dark and the weather must be clear. Nonetheless the aurora are always there as a ring around the northern and southern poles. The size of the rings depends on solar activity, the approaching solar wind that presses on and deforms the Earth's magnetic fields. Measurements of this interaction are now made by satellites, rockets and ground-based equipment.

Kiruna - the Space Centre in the north

The reason why Kiruna has become an important centre of space research is its location above the Arctic Circle, an ideal position for studying the northern lights. The field of space research in Kiruna is continuously growing. The research institutions in Kiruna specialized in space research employ and involve altogether about 500 people.

The main institutions are the following, all with access to the IRF library:

Swedish Institute of Space Physics, (IRF)
The main task is to conduct research and perform observatory measurements in the field of space physics, to study the physical phenomena that cause the aurora. The first satellite experiment which was built in Kiruna was launched in 1968. Several instruments sent up by satellites have been built by the staff at IRF and the institute is involved in many international satellite programs. There are many groups at IRF working in various fields: *in situ* studies of the magnetospheric hot plasma, optical and radar studies of the upper atmosphere and ionosphere, microwave and optical remote sensing of the middle atmosphere in relation to ozone research. Education in space physics is also provided. The University of Umeå accepts 30 - 40 students every year for a three year course at the Space Engineering Education Centre at IRF. This started in 1993 and the building is an extension of the IRF building.

ESRANGE
The civil balloon and rocket range is also a satellite tracking facility where rockets are launched and data measurements are received from space. Several campaigns for ozone research have been operated from ESRANGE, involving both balloons and aircraft. A huge exhibition hall - Arena Arctica - was built at Kiruna airport in 1992, to be used as a housing facility for aircraft undertaking ozone research in the northern polar region.

EISCAT
The European incoherent scatter radar system has its headquarters in the IRF building. EISCAT is owned jointly by Finland, France, Germany, Norway, Sweden and the United Kingdom. It is the worlds most powerful and flexible instrument for studying the connection between the sun and the earth's atmosphere - the processes which give rise to the aurora. It has two transmitters in Tromsö in northern Norway and reception stations in Kiruna, Sweden and in Sodankylä, Finland. Another radar is now being set up in Svalbard (Spitzbergen).

SSC Satellitbild
A satellite image processing centre converting satellite data into pictures and maps, which give information about the earth - forest, water, geological resources, etc.

ESA Salmijärvi
Receiving station for European Space Agency Earth Resource satellites (ERS-1).

Kiruna GIS-laboratory
A special laboratory for research in geographical information systems.

SIGIT
Research in geographic information systems, translating satellite pictures.

Environmental data centre
Collecting, storing and working with environmental data.

Cold Centre
A centre for the study of cold climate and survival has been set up in 1993 at Jukkasjärvi 20 km south of Kiruna. This is a joint venture between the Swedish National Institute of Occupational Health and the Swedish Army Survival Unit. Work under cold stress encompasses special health, safety and ergonomic problems. Among the main topics are research into accidents, injuries and diseases in the cold, medication, and design and evaluation of protective clothing etc. Some tests are being made in the biggest igloo in the world (Guinness Book of Records), which is constructed each winter on the lake in Jukkasjärvi. Apart from the cold research that is being done the igloo houses a church, hotel and conference facilities.

The IRF library

The library is the main space research library in Northern Sweden. It has, ever since Kiruna Geophysical Observatory (KGO) was established in 1957, been used

by scientists and engineers.When EISCAT headquarters was built as an extension of the building, their books and journal were also registered in the same catalogue.

After some years KGO changed its name to the Swedish Institute of Space Physics (IRF), which now consists of four divisions with the main office and library in Kiruna. The IRF library also serves the other divisions which are scattered from Umeå in the north to Uppsala in the south. Other users are scientists and engineers from the institutions mentioned above.There are also a number of guest scientists regularly using the library. In 1993 the number of users increased with the addition of 100 students as the University of Umeå educates space engineers at the Space Engineering Education Centre, an extension of the IRF building.

The library staff consists of two people, one working full time and the other one working 50% in the library. These staff are also responsible for the library project and its administration. A specialised classification system is used. The variety of information ranging from space physics to general physics, electronics and data handling cannot be accurately represented by a conventional classification system, so a special 64 sub-section letter system is used.

The basic library has now grown to more than 6000 volumes and is increasing at about 250 volumes a year. Most of the books are now registered in an electronic database ELIBRI. This system is also used in many other libraries in Sweden. Loans and photocopies from other libraries are approximately 100 a year and are now arranged through the scientific library database LIBRIS, which is a Swedish union catalogue. We hope to develop the use of the Internet to connect to libraries in other countries. The journals taken regularly comprise 200 covering the whole field of space research. They are also being registered in the ELIBRI database. The current journals are especially important in a rapidly changing subject like space physics as the books become out of date very quickly.

IRF has published 1100 reports up to June 1994. Among them is the Kiruna Geophysical Data Report which is distributed quarterly and summarized in booklet form. The number of data reports received regularly and stored is about 200 from 33 different countries. IRF also stores data from satellites and EISCAT-data as well as magnetic, riometer and infrasound data.

The library service at IRF will continue to expand in the near future. There are plans for a space and environmental research station, connected with IRF, to be set up in Kiruna in a few years time.

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Research libraries in Greenland and the emerging scientific communities - plans for building up databases and electronic networks

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Abstract: The education policy of the Greenlandic Home Rule is now beginning to bear fruit with the emergence of scientific communities inside Greenland. As a consequence of this the requests for scientific literature are growing. At present no libraries in Greenland have access to electronic networks. To be able to serve our public in the best way the National Library of Greenland needs immediate connections to international networks to allow access to the databases containing essential scientific information. In 1994 plans were discussed for establishing electronic networks at all three levels: international, national and local. Connections to the international networks are too expensive for a single institution and although several institutions wish to have one shared line, this is not possible at present. A national network has to be established first. With its collection of almost 200 000 volumes Groenlandica, the National Library of Greenland, will have a central position in a national network. Today only half of this collection is accessioned, so a 5 year project of loading the entire Groenlandica collection onto an electronic database is being planned. Groenlandica hopes to gain assistance from other institutions in undertaking the Groenlandica database project.

Key words: Greenland, library, electronic network

Introduction

In the first 15 years of Home Rule in Greenland the Greenland authorities and the scientists in Greenland have begun to take a growing and active part in the research carried out in Greenland. Until recently almost all research carried out in Greenland was both planned and mostly published outside Greenland. It was foreign research in Greenland planned and carried out by foreigners. But now Greenlandic researchers are an integrated part of many research teams operating in Greenland. In this way Greenland is getting better access to the scientific results from this research.

The education policy of Greenlandic Home Rule is now beginning to bear fruit with scientific communities now emerging inside Greenland. Of course, these scientific communities will develop primarily within the cultural and social sciences - archaeology, linguistics, anthropology, social science, etc. Most natural sciences are much too expensive to be fully developed by a nation with only 50 000 inhabitants. One of the major key words for all researchers living in Greenland must be 'international co-operation'.

Networks

The emerging scientific communities in Greenland feel a strong need to be able to communicate electronically with the international scientific communities. We are now trying to establish electronic networks, and the National Library of Greenland has taken a central position in these efforts.

Within the last few years both the Nordic Council and Denmark have pointed to Arctic research as an area with a high priority. In Greenland the politicians are now discussing a strategy for research in Greenland. Last year a Greenlandic research coordinator was appointed. The next step will probably be the introduction of electronic networks in Greenland. The building up of electronic networks will need to be on all three levels: international, national and local.

For a long time a connection to international networks has been a strong wish from both research and educational institutions in Greenland. In the National Library one of the results of the increased Greenlandic research activity and the Home Rule's education policy has been a perceptible increase in the requests for scientific literature. Thirty years ago the Groenlandica collection was referred to as a book museum, but today the demand is for the latest literature on a wide variety of topics. Of course Groenlandica can not be well-founded in all branches of science and scholarship. And this underlines our desperate need for connections to the international networks with the databases where we can get the information we must have to be able to serve our public in the best possible way.

There are, however, two major problems in establishing the electronic networks: legislation and financing. In Greenland there is only one telephone company, Tele Greenland. Tele Greenland only accepts one company or institution per line, and they do not

allow subscribers to let others use any unused space on a line - not even for free. All electronic communication outside Greenland goes via satellite and it is much too expensive for a single institution in Greenland to have its own dedicated line. Remember, we are very small institutions in Greenland. To illustrate this: the University of Greenland has a staff of only 10 researchers. What is needed now, is a political decision allowing research and education institutions to share lines and - hopefully - setting a special low price for such users.

Before we can share one line out of Greenland a national network has to be established. The first step towards a national library, research and education network has been taken. We are planning a library network between the different institutions in Nuuk: the university, the high schools, the national museum, and the library. At present each of these institutions do not even know which books the other institutions have in their libraries. This lack of co-ordination means unnecessary high expenses on inter-library loans because if the National Library receives an inquiry for literature we do not have we automatically order the book from a library in Denmark. By putting all the local libraries on one database, with on-line access, we can serve the public better - and save money.

It must be added, that the bigger businesses in Greenland (banks and others) have, for a long time, had their own networks and electronic connections to Denmark. Also the municipality association in Greenland has its own national network for administrative purposes. It might be possibile for the educational and research institutions to use this already existing nation-wide network.

Groenlandica, the National Library of Greenland

Calling Groenlandica a 'National Library' perhaps makes it sound more than it is. Groenlandica is only a branch of Nunatta Atuagaateqarfia, the central public library in Greenland. Today we have the head of Groenlandica, one librarian, one research librarian, and one assistant attached to Groenlandica. I am the research librarian at Groenlandica and the scientific areas of Groenlandica are a part of my field of responsibility.

The history of Groenlandica goes back to 1830, when the first library was established in Greenland. At Groenlandica we have a few of the books from this first Greenlandic library. Not until about 1940 was the Groenlandica collection established as a special, separate collection as we know it today. In 1956 an institutionalized public library system was established. The libraries were among the first areas of administration that the new Greenlandic Home Rule took over in 1980. Legislation for a reorganization of the library system passed in the Greenlandic parliament defined the purpose of Groenlandica. Groenlandica has two tasks:

1. to collect all Greenlandic-language literature - as this is the national collection.
2. to collect literature in any language dealing with Greenland and the Arctic for the scientific collection.

Now the Groenlandica collection consists of almost 200 000 volumes in Greenlandic or about Greenland and the Inuit, but only half of the collection is properly registered. Ten years ago Groenlandica published a catalogue including all the material registered at that time, but this catalogue is now significantly out of date. Because of economic reductions in the 1980's the Groenlandica branch was unable to make any progress for almost ten years, creating a large backlog of work. In the last few years new economic funding have been put into the Groenlandica branch to bring the accessioning of the Groenlandica collection up to date. A project to update the Groenlandica catalogue will, if successful in raising the mone, enable us to complete the work before the year 2000.

A lot of what is in the Groenlandica collection can be found at other libraries, for instance at The Royal Library in Copenhagen. But in Groenlandica we have a large and unique - but still unaccessioned - collection of grey literature about Greenland. Most of this grey literature is not registered anywhere else in the world. I hope to be able to create two databases. The first database would be a reference database including:

1 The Groenlandica collection.
2 Bibliographica Groenlandica - published in 1890.
3 Possibly the library of the Danish Polar Centre in Copenhagen.

The other database would be a full-text database including:

1 The large index to the 206 volumes of Meddelelser om Grønland (more than 1000 pages).
2 An extensive unpublished card index of articles on Arctic subjects collected by eskimologist Svend Frederiksen.
3 The card index collected by Balle.

As many as possibly of the articles in these indexes should be available on the database in full text.

At present it is not known whether the new Groenlandica catalog will be distributed on CD-ROM or it will be made accessible as an on-line database on Internet. A third possibility might be to let the Groenlandica catalog be a part of *PolarPac*. Groenlandica has been referred to as one of the contributors to all the three editions of *PolarPac*, but this is not true. Groenlandica may have been involved in the planning of the first *PolarPac* but we have not yet contributed a single bibliographic record.

We are in contact with some Danish and Nordic institutions to seek help for the Groenlandica updating project. But I hope that what Groenlandica can offer to the polar libraries is of so much interest that those of you who have experiences with the same kind of projects are willing to help us get started with this important project.

A permafrost cartobibliography

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Abstract: A bibliography of medium to large scale maps of permafrost has been compiled. The eighteen maps included, which range in scale from 1:24 000 to 1:10 000 000, cover all or parts of Alaska, Canada, North America, China, Russia or the former USSR, Mongolia and the Circum Arctic region. The more recently published maps are based on field geological and geophysical data and include information on ground ice conditions. These attributes significantly enhance their value for practical purposes - such as construction and development planning, and global change studies.

Key words: permafrost, ground ice, maps, bibliography, cartobibliography, cartography

The importance of permafrost studies

Permafrost is pervasive in polar land regions (Fig. 1). It occurs also at high elevations in many mountainous regions of the world, including the Qinghai-Xizang (Tibet) Plateau of western China. Relict permafrost, dating from the cold periods and low sea-levels associated with Pleistocene glaciations, is found beneath the continental shelves of the Arctic Ocean and, on land, south of the present limit of contemporary permafrost, particularly in West Siberia.

Permafrost, as formally defined, is a strictly thermal condition of the earth, namely 'ground (soil or rock) in which the temperature remains continuously below $0^{o}C$ for a period of two winters and the intervening summer' (Permafrost Subcommittee 1988).

The distribution of this phenomenon has been of theoretical and practical interest to geographers, geophysicists and engineers for many decades, mainly because of the significant influence it exercises over many aspects of life and work in areas underlain by permafrost. An understanding of the properties of frozen ground is necessary for all but the simplest forms of construction and development in permafrost regions. A key attribute of permafrost is the occurrence of almost all soil moisture in the form of ice -- ground ice.

In fact, for most forms of economic or developmental activity in permafrost regions, the temperature of the ground as such is less significant than the presence of this ground ice within the permafrost. This follows from the ground stability problems associated with any disturbance and subsequent thawing of ice-rich permafrost. Thus, accurate information on the character, distribution and form of both the frozen ground and the ground ice, as well as the geographical and geological setting of their existence, are all important for rational planning of development in permafrost regions.

In various ways, permafrost has had significant effects on the economic development of polar and mountainous regions, particularly for the energy and mining industries, but also for the construction of modern settlements and infrastructure elements such as roads, railways, airfields and utilities.

Historical review of permafrost maps

Heginbottom (1984) presented a review and classification of permafrost maps. According to Nikiforoff (1928) and Baranov (1959), the earliest known map depicting permafrost was prepared by G. Vil'd of Siberia; it was published in 1882 and shows the southern boundary of the "everfrozen region". Since then well over 150 different maps of permafrost and related phenomena have been compiled and published. Heginbottom (1984) grouped these maps into four categories:

Miniature maps

Maps of the world, the northern polar regions, or the northern hemisphere continents showing the distribution of permafrost as known at the time of their compilation. These maps range in scale from about 1:30 000 000 to about 1:50 000 000. Examples are the maps by Black (1954) and Péwé (1983) and the one illustrated in Fig. 1.

National maps

Maps showing the distribution of permafrost for politically defined areas. Scale and level of detail vary widely according to the size of the area covered. These maps can be grouped according to size as single page maps, typically at scales of between 1:10 000 000 and 1:50 000 000, and atlas or wall maps, on larger sheetsand generally at scales of between 1:1 000 000 and 1:15 000 000. Examples of the first subclass are Rapp & Annersten's map (1969) of discontinuous permafrost in Sweden, Weidick's map (1968) of the extent of permafrost in Greenland, and Ershov's compila-

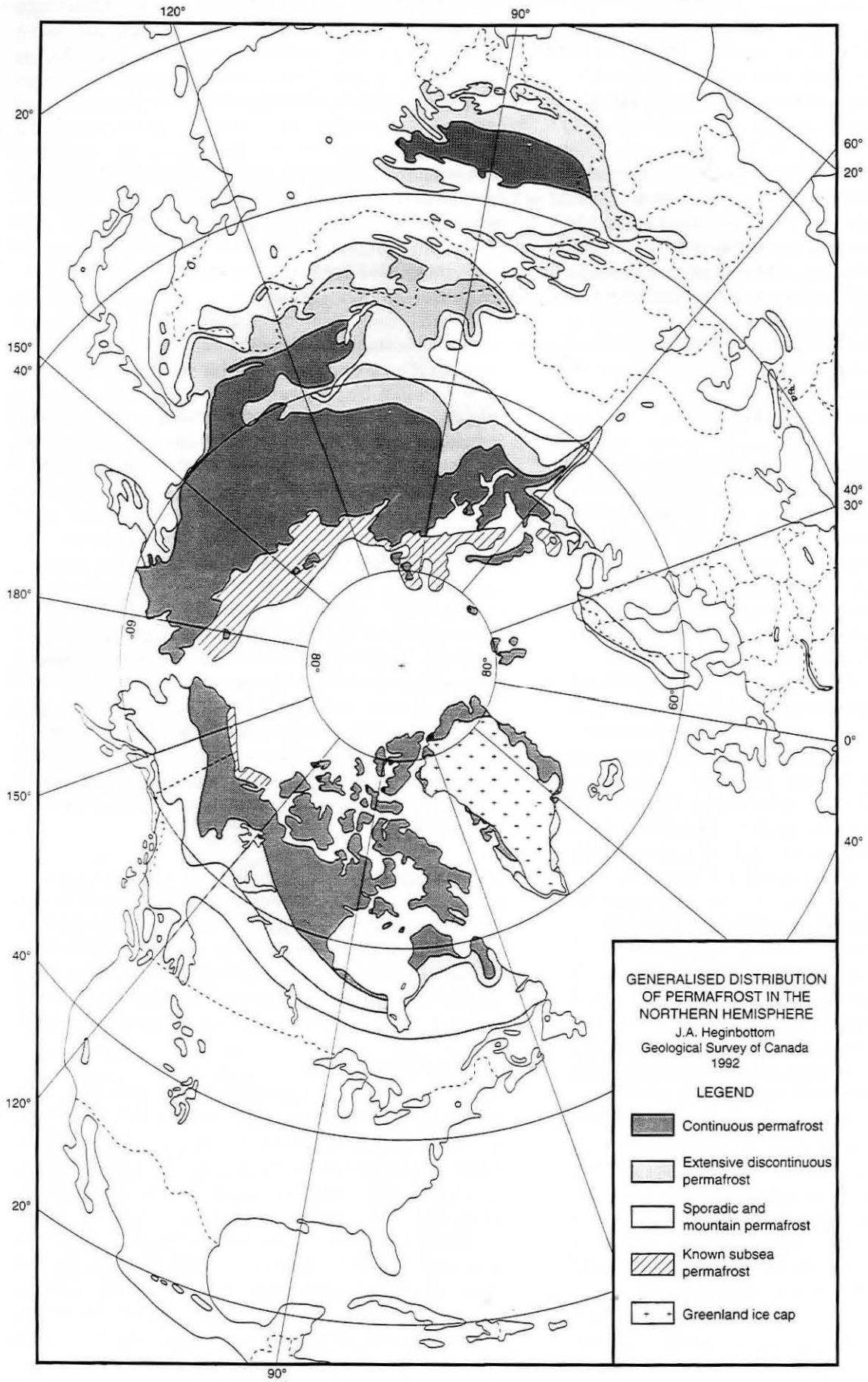

Fig. 1. Generalised distribution of permafrost in the northern hemisphere

tions (1988, 1989) for the former Soviet Union. Examples of maps in the latter subclass include maps of Canada (Brown 1967, 1973, 1978, Heginbottom *et al.* in prep.), the map of China by Shi & Mi (1988), Ferrians' (1965) map of Alaska, and maps of the USSR and North America by Popov *et al.* (1985, 1990).

Regional and local maps

Maps of permafrost or ground ice conditions or related features, which are available for many areas and at a variety of scales. Examples of these maps include Melnikov's map (1966) of Yakutia, Péwé's map (1982) of the Fairbanks area of Alaska, maps of West Siberia (Baulin *et al.* 1982a, 1982b), of the Qinghai-Xizang Highway by Tong *et al.* (1982), and Heginbottom & Radburn's map (1991) of northwestern Canada.

Maps of the former extent of permafrost

Maps of various areas showing the distribution of features indicative of the former occurrence of permafrost conditions, such as Kaiser's map of western and central Europe published in Washburn (1980).

Map content

Permafrost maps may also grouped by their contents or legend. Most, and particularly those at smaller scales, show the extent and distribution of `climatic permafrost', as defined by climatic conditions and usually divided into the continuous and discontinuous zones (e.g., Brown 1973). Some maps in this group show areas of alpine or mountain permafrost (e.g., Brown 1967, Gorbunov 1978) and subsea permafrost (Mackay 1972, Péwé 1983). A second set of maps show specific attributes such as thickness and temperature of permafrost (Judge 1973, Ershov 1988, 1989) or the distribution of geomorphic features indicative of the occurrence of ground ice, of frozen ground, or of the former extent of frozen ground (Popov *et al.* 1966), including pingos (Hughes 1969), ice-wedge polygons or ice wedges (Shumskiy and Vtyurin 1966), and ice-wedge casts (Williams 1969). A third group of maps relates permafrost conditions to environmental conditions including temperature (Crawford & Johnston 1971), extent of glaciation (Hughes 1973), and geology, hydrology or vegetation (e.g. Ferrians 1965, Fotiev 1978, Bliss 1979). Complex maps contain environmental, permafrost and ground ice information. Such maps have more often been prepared in the former Soviet Union (e.g. Baranov 1956, 1965, 1982, Kudryavtsev *et al.* 1978, Melnikov 1966, Fotiev *et al.* 1978, Vtyurin 1978, Ershov 1988, 1989).

The Cartobibliography

The present cartobibliography (Appendix 1) includes details of eighteen medium and large scale maps of permafrost conditions. By restricting the compilation to maps at medium and large scales, the plethora of page size maps in books, journals and reports is excluded. Thus the maps included range in scale from 1:24 000 to 1:15 000 000, and the sheet sizes range from 43 x 41 cm to 220 x 154 cm (width x height). Some of the larger maps have been published in two or four sheets.

The impetus for this compilation has been the publication, over the last decade or so, of several new, full colour maps of permafrost and ground ice conditions in China, Canada and the former USSR. Most of these are compilations based on geological field work, rather than maps of the presumed distribution of perennially frozen soil conditions (Heginbottom 1984), as was the case with many earlier permafrost maps.

The earliest map in the compilation is a map of Canada (Jenness 1949); the most recent are two maps still in preparation - a new map of Canada (Heginbottom & Dubreuil 1993, Heginbottom *et al.* in prep.) and a circum-Arctic map being prepared by a working group of the International Permafrost Association (I.P.A) (Heginbottom *et al.* 1993, Brown *et al.* in prep.)

Use of colour

Sixteen of the eighteen maps are or will be published in full colour editions. The exceptions are the map of Canada by Jenness (1949) and the map of the Illisarvik and Tuktoyaktuk areas by Heginbottom (1988). Jenness uses coloured lines and symbols to show the information on the distribution of permafrost and related data. Heginbottom's map is an outline map, intended to be hand coloured by the user.

Language

The legends of all the maps published in North America are in English or, in the case of several of the Canadian maps, in English and French (either as bilingual maps or as parallel English and French editions). The China map (Shi & Mi 1988) has a bilingual legend, in Chinese and English. The Tibet Highway map (Tong *et al.* 1982) is available in a Chinese only edition, or in an edition with the title and legend overprinted in English. The five maps produced in Russia, including the maps of North America and Mongolia, are available only in Russian language editions.

Descriptions of the maps

Descriptions of many of the maps, of the philosophy of their compilation, or both, as published by the map compilers are also available in English, mainly in the papers volumes of the various International Conferences on Permafrost. Examination of these reports, the legends and the maps themselves allows a comparative evaluation of the different approaches used in their preparation.

Discussion

As noted in the historical review, permafrost maps may be based on limited field or ground data supplemented with more extensively available climatic data, and show primarily the distribution of permafrost as a soil climate phenomenon. Most of the older maps (up to 1978) fall into this category. The major exceptions to this generalisation are the permafrost maps of Alaska (Ferrians 1965) and the Fairbanks area (Péwé & Bell 1974), which were firmly based on geological conditions. The map of Yakutia (Melnikov 1966) is also an exception, although the relative extent of geological as against climatic data used in its compilation is not clear from a study of the map. This map also includes information on the distribution of bodies of ground ice. These are shown by means of symbols, although representativeness of the symbols and the significance of their placement are not explained.

The maps of USSR (Popov *et al.* 1985), China (Shi & Mi 1988) and North America (Popov *et al.* 1990) are like the maps of Alaska (Ferrians 1965) and Yakutia (Melnikov 1966), in using a combination of relatively sparse field data on permafrost conditions along with general geological field data and climatic data to develop a general picture of permafrost conditions throughout the mapped territory. As with the map of Yakutia (Melnikov 1966), some information of the distribution of bodies of ground ice is shown by symbols on the maps by Popov *et al.* (1985, 1990). The same concern over their real meaning applies. No information on ground ice is included in the map of China (Shi & Mi 1988).

In contrast to these maps are the maps of northern West Siberia (Baulin *et al.* 1982a, b), the Qinghai-Xizang Highway (Tong *et al.* 1982) and Northwestern Canada (Heginbottom & Radburn 1992), which are derived entirely from geological and engineering field mapping data. For example, in preparing the "Map of the zonation of the West Siberian plain based on the thickness and structure of permafrost" (Baulin *et al.* 1982b), a catalogue of all the boreholes used in its compilation was also prepared and published (GOSSTROI 1985). The northwest Canada map (Heginbottom & Radburn 1992) provides another example; this map was prepared by compiling data on permafrost extent and ground ice conditions for each surficial geology map unit, for each map area within the region of interest. The source maps ranged in scale from 1:100 000 to 1:250 000, and all included considerable geocryological information on a map unit by map unit basis.

In addition to data on the extent of permafrost, two of these maps (Baulin *et al.* 1982a, Heginbottom & Radburn 1992) also include information on ground ice conditions, on a map unit by map unit basis. The information relates to the general quantity of ice in the ground, in qualitative terms, and to the occurrence of large bodies of ground ice (ice wedges, pingos, and massive ice). In their reliance on published geological, geophysical and engineering data, these maps offer a new standard of validity for the mapping of permafrost as a geological phenomenon. It should be noted, however, that these maps are all at relatively large scales (1:1 500 000, 1:2 500 000, 1:1 000 000 and 1:600 000 respectively). The difficulties associated with compiling geologically based maps of permafrost and ground ice for continent sized regions still remained to be resolved.

The two most recent maps in the cartobibliography (Heginbottom *et al.* in prep., Brown *et al.* in prep.) attempt to address this issue. They are being compiled from a combination of field data and general knowledge of environmental factors controlling the distribution of permafrost and the occurrence of ground ice. The map of Canada (Heginbottom *et al.* in prep.) uses a physiographic regionalization of the country (Bostock 1970) to provide the framework for compiling the permafrost and ground ice information (Heginbottom & Dubreuil 1993). This framework, and tabulated data on permafrost and ground ice conditions (based on field data) and on key environmental factors, permit the "prediction" of permafrost and ground ice conditions for those areas of Canada for which field data are sparse or entirely lacking. This new Canadian map also includes data on permafrost temperature and thickness for some 70 point locations across the mapped area.

The IPA map (Brown *et al.* in prep.) also relies on physiographic or landscape regions to provide the framework for organizing the thematic data to be portrayed (Heginbottom *et al.* 1993). For Alaska, map units are based on the 1965 map "Physiographic Divisions of Alaska" (Wahrhaftig 1965) and contain information being used to revise the 1:2 500 000 map of Alaska (Ferrians 1965). The Canadian contribution utilizes the 1967 map "Physiographic Regions of Canada" (Bostock 1970) as a base map and contains much of the information presented on the new permafrost and ground ice map prepared for the 5th edition of the National Atlas of Canada, (Heginbottom & Dubreuil 1993). Russian map units are derived from the geosystems or landscape approach described by Melnikov (1988), in which natural geosystems are delineated according to common relief, vegetation, soil and soil-forming materials and climate. Units for China and Mongolia are based on recompilations of the maps by Shi & Mi (1988) and from Sodnom & Yanshin (1990), respectively. Existing information for the Nordic countries, Greenland, and other mountainous regions of Europe and Asia were modified and compiled from numerous published and unpublished sources with the assistance of specialists in each region.

Conclusions

This brief review of medium and large scale, coloured maps of permafrost shows that real progress has been made since the first maps of perennially frozen ground were produced earlier this century. The newer maps include more information, with a broader range, scope, detail and quality of information, generally better founded in field data, and presented in a more sophisticated manner. They have gone from a simple map of the outer limit of frozen ground, to complex, multifactor maps, which look at permafrost in terms of its extent, distribution, temperature, thickness, lithology and geological setting, and provide a similar suite of information on ground ice conditions. Linking the permafrost information to landscape units, for the smaller scale maps, or to geological units, for the medium and larger scale maps has significantly improved their usefulness. Furthermore, inclusion of ground ice information also significantly enhances the value of these maps.

The job is not over, however. No one map in the collection provides all information on permafrost and ground ice conditions and their environmental setting, if this were even possible in itself. There is still a need for more and better information on permafrost conditions at local, regional and continental or global scales, for planning development and land management, including society's responses to global climatic change. How can these concerns be addressed ?

There are other challenges -- there is a need for more explicit information about just what is being mapped, and how the data are being processed into mappable information -- for international maps, this presents interesting problems of terminology, definitions and even mapping philosophy.

Given the difficulty of displaying complex, multifactor phenomena on conventional maps, this traditional approach may be reaching the limits of its applicability. One cannot continue to add more categories of information, more data points, and so on, and still produce meaningful, conventional maps. The answer lies in the application of new informatics approaches, particularly GIS technology. If coupled with expert systems and even artificial intelligence, further progress will be possible. This is the next challenge for the international permafrost community.

Acknowledgements

The contributions of translators of the Multilingual Services Division, Department of the Secretary of State, and of Douglas Tedford, Geological Survey of Canada Library, in translating Russian map legends is gratefully acknowledged. This is Geological Survey of Canada contribution number 26594.

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Appendix 1. Chronological List of Permafrost Maps

1. **Permafrost in Canada: its distribution and approximate southern limit** J.L. Jenness. Scale 1:15 000 000. 1 map: black and white, with coloured symbols; 1 sheet, 43 x 41 cm. (Montreal: Arctic Institute of North America), 1949.
2. **Permafrost map of Alaska** O.J. Ferrians, Jr. Scale 1:2 500 000. 1 map: coloured; 1 sheet, 124 x 95 cm. (Washington, D.C., U.S.A.: United States Geological Survey), 1965. Miscellaneous Investigations Map I-445.
3. **Schematic Geocryological map of the Yakutsk ASSR** P.I. Melnikov. Scale 1:5 000 000. 1 map: coloured; 1 sheet, 58 x 56 cm. (U.S.S.R.: Permafrost Institute, Siberian Section, Academy of Sciences of the U.S.S.R.), 1966.
4. **Permafrost in Canada** R.J.E. Brown. Scale 1:7 603 200. 1 map: coloured; 1 sheet, 100 x 80 cm. (Ottawa, Canada: Division of Building Research, National Research Council of Canada, and Geological Survey of Canada), 1967. Geological Survey of Canada, Map 1246A; National Research Council Publication No. NRC 9769.

5a. **Permafrost [Canada]** R.J.E. Brown. Scale 1:15 000 000. 1 map: coloured; 1 sheet, 52 x 37 cm. *In* Canada, Surveys, Mapping and Remote Sensing Sector, National Atlas Information Service. National Atlas of Canada, 4th ed. (Ottawa: Surveys, Mapping and Remote Sensing Sector, National Atlas Information Service), 1973. Plate 11-12.

5b. **Pergélisol [Canada]** R.J.E. Brown. Scale 1:15 000 000. 1 map: coloured; 1 sheet, 52 x 37 cm. *In* Canada, Secteur des levés, de la cartographie et de la télédétection, Service d'information de l'Atlas national. Atlas national du Canada, 4ieme ed. (Ottawa: Secteur des levés, de la cartographie et de la télédétection, Service d'information de l'Atlas national), 1973. Planche 11-12.

6. **Map showing distribution of permafrost in the Fairbanks D-2 SW quadrangle, Alaska** T.L. Péwé and J.W. Bell. Scale 1:24 000. 1 map: coloured; 1 sheet, 69 x 80 cm. (Washington, D.C., USA: United States Geological Survey), 1974. Miscellaneous Investigations Series, Folio I-829-B.
7. **Permafrost = Pérgelisol [Canada]** R.J.E. Brown. Scale 1:10 000 000. 1 map: coloured; 1 sheet, 99 x 52 cm. (Ottawa: Department of Fisheries and the Environment = Département des pêches et de l'environement; Hydrological Atlas of Canada = Atlas hydrologique du Canada), 1978. Plate = planche 32.
8. **Geocryological regions of the West Siberian Plain [Russia]** V.V. Baulin (Editor in Chief). Scale 1:1 500 000. 1 map: coloured; 4 sheets, 70 x 70 cm each. (Moscow: USSR State Construction Council; USSR Ministry of Geology; USSR Ministry of Higher and Specialized Secondary Education), 1982.
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Polar tourism: do library resources meet researchers' information needs?

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Abstract: Recent development at the Scott Polar Research Institute of an interdisciplinary study in polar tourism has raised the issue of how adequate are current polar library resources in meeting the bibliographic and archival needs of a new research field, and how much help researchers in such a field may expect from the polar library network. In a case like this, where parts of the relevant literature are non-polar and parts non-academic, standard bibliographic databases reflecting the holdings of particular academic libraries, and standard regional reference works, are found to be inadequate. The most likely solution appears to be the designation of one centre as a specialist library on polar tourism, and employment of a specialist librarian for cataloguing and archiving material from all sources, who will make the material available to other research centres. A parallel is drawn with the existing ICSU World Data Centre organisation for glaciology and other scientific topics.

Key words: polar, tourism, library resources.

Introduction: the problem

Three years ago the Polar Ecology and Management Group of the Scott Polar Research Institute embarked on a six-year study of tourism in Antarctica and the sub-Antarctic islands. Eighteen months ago the study was extended to include aspects of Arctic tourism. These are multi-disciplinary studies involving both field-work and bibliographic research, and touching on a wide range of disciplines from land management, geopolitics and environmental law to applied ecology, social anthropology and both animal and human behaviour.

Like any other group of researchers entering – indeed in this case defining – a new field of research, we need to know what raw materials of data and published information are available. We seek a database of information, minimally a bibliography of data and literature covering both observations and research, if possible enhanced by a literary archive, including copies of reports, publications etc.

This is neither more nor less than other researchers need, but our multi-disciplinary approach makes our needs unusually difficult to satisfy. Cross-disciplinary to the point of waywardness, polar tourism research includes not only aspects of the sciences and humanities, but also issues of management, which the purer forms of both science and the humanities tend to discount as technology.

Unlike glaciologists, biologists, lawyers or others working in well-established disciplines, we cannot rely on a single existing specialist bibliography. For general studies – for example travellers' reports, cruise itineraries and departmental statistics of tourist numbers – we need a bibliography on general aspects of polar tourism. For specialized studies – for example wear and tear on vegetation, methods of monitoring the heartbeat of birds subjected to human impact, or tourist responses to indigenous Arctic cultures – we need well-informed selections from a range of specialist bibliographies. Those entering the field for the first time, especially students embarking on research, will welcome both.

Within the Universal Decimal Classification system (Mills 1994) polar tourism is allocated the subject identifier 796.51.7. All libraries using this system are therefore able to select a polar tourism bibliography from their own holdings. This solves one of our problems but raised another. We need the solid academic literature that such a selection might yield, but find useful information also in newspaper and magazine articles, reports published and unpublished, tours brochures and other soft literature, which are not the normal stock-in-trade of academic librarians. Nor is space likely to be found for this kind of literature in an academic archive, unless the archive becomes a known repository for a particular subject area.

Our study is polar, and at SPRI we are thankful to have a superb polar library at our disposal. But a polar library does not carry the non-polar journals and reference books – for example in tourism management, maritime law, economics or conservation – which may be key aspects of our research. Tourism management is a world-wide discipline in its own right, with an extensive international literature of its own. Only a fraction of that literature is polar, and what there is may never cross the desk of a polar librarian. Yet somehow we need to scan it.

To what extent can we expect existing library systems to cope with our needs? Librarians will no doubt have

met the syndrome before -- a group of researchers identifying what they are pleased to think of as a new field of enquiry, requesting a bibliography that covers the field exhaustively. This presents the problem in general terms but does not solve it. To advance in our work, we still need the information that provides the raw materials for research, and tells us what has already been achieved.

This paper outlines practical aspects of the problem, indicates a possible remedy, and invites comment from the polar library community.

An interdisciplinary research field

Polar tourism is a relatively new phenomenon. Commercial recreational visits have been made to the Arctic from North American and northern Europe for only about a century, mainly for sight-seeing and hunting. Antarctic tourism began even later. Isolated by distance, rough seas and pack ice, neither the continent nor it fringing islands attracted commercial tourism until the last 1950s, with overflights and visits from tourist ships. However, tourism is currently developing and intensifying at both ends of the earth, bringing benefits and disadvantages that, together with the industry itself, form the main substance of our studies.

Both ends of the earth are repositories of natural beauty, wildlife, wilderness and other qualities that many regard as resources, to be used for the advantage of mankind. Neither is pristine: both are already scarred by waves of economic development, including whaling, sealing, scientific research and military endeavour. Tourism is the newest polar industry, regarding by some as a godsend to be welcomed unequivocally, by others as a two-edged sword to be handled with care and misgivings.

Arctic tourism has developed in the presence of an indigenous population, whose communities and cultures cannot fail to be affected by its growth. Some stand to benefit, others may be destroyed, according to the forms of tourism that are allowed. Antarctica has no natives, but a population of transient scientists and technicians workings under the Antarctic Treaty, an international regime dedicated to maintaining the Antarctica as a continent for science. The regime tends to be neutral or discouraging to non-scientific activities, in which tourism is included.

The Arctic attracts about 100 000 tourists annually -- small numbers compared, for example, with any of the more popular national parks outside the polar regions. Antarctica attracts even fewer -- possibly 8000 in 1993-94. However, public awareness of possibilities for tourism in both regions is increasing. Each year sees more advertising of polar cruises, more ships engaged in the business, more venues opened to tourists. Many Arctic governments and communities see tourism as a means of broadening and diversifying their all-too-narrow bases for economic development. Without official encouragement, Antarctic tours operators have doubled and redoubled their clientele since the mid-1980s, and seem set for a further redoubling by the end of the century.

Little is known of the history of this industry, or of its impacts on the Arctic and Antarctic. We had, and still have, very few data from which to trace its evolution or model its future development. Hence our interest in studying the industry, and monitoring its effects on polar environments.

Polar tourism has proved a rewarding research field. In the past year this Institute alone has manned two Antarctic stations with a total of twelve researchers and support staff, and researchers have taken part in several Arctic and Antarctic cruises. We currently support six MPhil and PhD students -- five internal and a sixth at the Sorbonne, Paris -- working on ecological and management aspects of polar tourism. We would have no difficulty in keeping busy half a dozen more. Our studies range from animal behaviour and ecology, including the response of penguins and other indigenous species of birds and mammals to visitors, wear and tear on moss beds, to land management regimes, visitor management, social anthropology, Antarctic Treaty law, tourist preferences, maritime regulations covering shipping in polar areas, and management plans for sites where tourists are landing.

Tourism is said to be the world's largest and also its fastest-growing industry, and tourism management studies are proliferating: many universities already cater for them at undergraduate and postgraduate levels. Polar tourism is proving of particular interest in the Arctic: I am currently helping to establish academic studies in this field at the Finnish University of Lapland. Research too has begun at several centres. For Antarctic aspects of our study we collaborate with researchers in Australia, New Zealand, Chile, Argentina and South Africa. In Arctic and bipolar aspects we have links with colleagues in several other UK universities, Canadian, US and Scandinavian universities, and the Arctic and Antarctic Research Institute, St. Petersburg, Russia.

To study such an industry and its environmental consequences from the early stages of development is both academically valid and practically useful. This view is clearly shared, not only by researchers all over the world but by conservationists concerned with the fate of polar environments, by administrators with responsibilities for managing tourism, and by representatives of this burgeoning industry who seek to predict its future.

Developing a sound working bibliography and archive, and making them widely available to researchers, are essential steps in the development of an interesting and significant research field.

Existing bibliographies

In the absence of a single ready-made bibliographical database, we must draw on existing bibliographies to create one. Where do we start?

As a first approach to the problem I scanned existing polar bibliographies. The Arctic Bibliography of the Arctic Institute of North America, compiled annually and biannually from 1951 to 1975, listed under the index heading "Tourist Industry" a total of 182 entries. There was no listing for tourism in the first four volumes, up to 1954. Volumes 5-9, from 1955 to 1960, had only six or seven tourism entries each, averaging five per year. Volumes from 10 onward listed between 15 and 39 entries each, averaging almost 11 per year.

The Antarctic Bibliography of the Library of Congress, which began publication in 1965 and now runs to 20 vols up to 1993, contains a total of 92 entries under the index heading "Tourism". A retrospective volume covering 1951-61 includes only four further entries. Thus the bibliography to date includes 96 entries for a span for 42 years, a mean of just over two entries per year. Volumes 16 to 20, covering the period 1988-93, total 38 entries, averaging over six per year.

These bibliographies provide a starting point. Both are clearly deficient in their early years: the Arctic bibliography, for example, lacks government statistics of tourism which begin to be included in later years, and the Antarctic bibliography has missed a number of recent entries known to us from travel journals and similar sources. Some of this is mainstream academic literature: some is material from the fringes of academic literature, but nevertheless useful.

Both bibliographies are well annotated. The increasing number of entries in later years to some degree reflects a growing output of literature, matching the growth of the industry. However, it appears also to represent a growing interest or familiarity of the cataloguers with sources of information. It is particularly unfortunate that the Arctic bibliography closed just when its annual inputs on tourism were becoming both substantial and interesting.

A second approach was to scan two recent commercially-published bibliographies of polar regions, King (1989) and Meadows, Mills & King (1994). These volumes form a part of a regional series, the purpose of which is to provide (usually for states rather than regions) selected references giving '.. an interpretation of each country that will express its culture, its place in the world, and the qualities and background that make it unique.' King's Arctic bibliography provides 935 entries, of which six, dated between 1982 and 1986, are indexed under 'Tourism'. The Antarctic bibliography of Meadows *et al* yields 1195 entries, of which 22, dated between 1969 and 1993, are indexed under 'Tourism'. and eight further items are cross-referenced to other sections. All entries in both bibliographies are annotated.

Again these publications provided a starting point for researchers -- as is their intention -- but little more. While the items listed for the Arctic give a flavour of recreational travel in the north, those listed for the Antarctic cover a slightly broader spectrum, providing an introduction not only to travel but to the whole topic of polar tourism in the south.

A third approach was to seek bibliographies selected for polar tourism from the holdings of libraries that are dedicated either to tourism or to polar research. One of each was available, the first a publication of the Centre des Hautes Etudes Touristiques, Universite de Droit, d'Economie et des Sciences, Aix en Provence (Baretje 1993), the second a printout from SPRILIB, the computer-based catalogue of SPRI library. The two provide interesting comparisons with each other, and with the bibliographies previously listed.

Under the title 'Le tourism dans les regions polaires', the French bibliography provides 248 entries dated between 1969 and 1992. Of these, 20 are listed for the decade 1969-78, 106 for the decade 1979-88, and 89 for the four-year period 1989-92. Entries in this bibliography are not annotated.

The SPRILIB listing included 305 entries, all fully annotated, dating from 1968 to 1994. For direct comparison with the French bibliography, they included nine for the decade to 1978, 53 for the decade to 1988, and 169 for the four years to 1992. Yearly totals of 30 to over 50 entries from the late 1980s onward suggest that this bibliography, more than any of the others under consideration, currently records a representative proportion of the literature as it appears.

These two bibliographies, based as they are on widely differing institutional requirements, hold only 85 items in common. Despite its wider coverage, SPRILIB misses items mainly from the international tourism literature, which the library of tourism picks up. Conversely the French library falls short on important items that are predominantly polar. The two between them begin to approach our needs for contemporary literature. Neither is of much help for earlier records.

SPRILIB in fact underestimates the information available at SPRI, for the computer-based listing began only in 1985, when it replaced the Institute's original card-based files. About 120 earlier items thus await incorporation into the electronic database. Were this done immediately, the SPRILIB list would include over 420 items, spanning more than a century. This would to some degree cover our need for earlier information, particularly on Arctic tourism.

However, the bibliography, even if enhanced in this way, would still be far from the database we need. Almost every substantial review paper and research report that we scan contains references to papers in English, Russian, French or German that are not included in SPRI listings ancient or modern. The many government reports and other sources of statistical information listed remind us that almost every set is

incomplete, and that similar reports from other countries or sources are missing. SPRI has provided a list of the holdings of an unusually well-founded polar library. If these holdings do not add up to our database, how can we improve the situation?

The remedy

It comes as a pleasant surprise to find that, of all the bibliographies currently available to our research team, the most complete happens to be that of our own institute in Cambridge. That the bibliography falls far short of our requirements for a research database is less surprising. No general-purpose library serving a research institute, even one specialised in a particular field, can be expected to cater fully for all the needs of all its readers. However, the identification of a valid new field of study, within the broad scope of the institute's specialization, may provide opportunity for the library to develop and specialise in a meaningful way.

For such a development there are two requirements -- the presence of an active research group, and the willingness and capacity of the library staff to respond to its needs. Without the research group there is no incentive for development; without well-motivated library staff the work will not be done. Where a research group has formed and knows what it wants, how can the library respond?

To convert an *ad hoc* bibliography into a research database requires the dedication of an information specialist, a librarian perhaps, whose main responsibility, part-time or full-time, is to liaise with the research group and seek relevant information wherever it may be found. By searching other bibliographies and reference lists, by scanning literature, by ferreting out sources of data, by writing, faxing, telephoning and xeroxing, by borrowing, and even paying for information -- only in this way can the necessary material be brought together.

SPRI has been fortunate for many years in hosting World Data Centre C (Glaciology) of the International Council of Scientific Unions (ICSU), which provides a model for such a development (ICSU 1987). The Centre's manager, Ms. Ailsa MacQueen, independently funded by the Royal Society on behalf of ICSU, works in liaison with the library to maintain just such a database covering all aspects of ice and snow study. The catalogue is available to other institutions on-line, and the manager provides literature searches and public information of glaciological topics, including a postal and telephone enquiry service and use of the World Data Centre facilities at cost. One important consequence for the Institute is a vast enrichment of the library in these fields, manifest in *Polar and Glaciological Abstracts*, a quarterly publication of bibliographic references.

Researchers lack the time and the skills for this task: a librarian trained in gathering and organising information, working as one of the research team, is far more likely to succeed. It would be unrealistic in most fully-burdened libraries to expect such a service from existing staff. The remedy is the appointment of an additional member of staff, funded independently, if appropriate as a charge on a research budget, to perform for polar tourism tasks equivalent to those outlined above for glaciology. Efforts are currently being made to secure funding for such a post, to be tenable at an appropriate institution where research on polar tourism is actively being pursued.

Conclusions

Polar tourism studies, like any other developing field of interdisciplinary research, requires a bibliographic database and archive of readily available reference material. For the development of such specialised facilities even the best institutional libraries are unlikely to prove adequate. The only remedy is the appointment of a dedicated information officer whose business, part-time or full-time, is to liaise between researchers and library, building up a database and reference collection. The appointment should be recognised both as an addition to the library staff and an essential adjunct of the research team, and funded accordingly.

Acknowledgements

I thank the staff of the SPRI library for their help in promoting our research, and William Mills and Ailsa Macqueen for helpful discussion in the preparation of this paper.

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Nunavut: implications for the Inuit

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Abstract: This paper presents a brief overview of the history and major features of a unique aboriginal claim settlement, that of Nunavut - "our land" in Inuktitut - the new jurisdiction to be established in the eastern part of the Northwest Territories, Canada, by 1999. The paper focuses on the implications for the Inuit of the Agreement, in areas of local government, land, wildlife and conservation, economic benefits and aspects of culture and lifestyle. The Nunavut Act (1993) and the Nunavut Land Claims Agreement provide for a settlement that not only encodes and extends traditional Inuit rights to the land but also creates a form of local self-government that will be both de-centralized and based on consensus and a recognition of a northern lifestyle for the 17 500 Inuit of the area. The paper supplements the publication *Nunavut: an annotated bibliography* (Simpson *et al.*1994), which covers the historical development of the political concept of Nunavut to December 1993.

Key words: Nunavut, landclaims, Inuit, Northwest Territories, politics, lifestyle

Introduction

A milestone in Canada's history occurred in May 1993 with the signing of the Nunavut Land Claim Agreement between the Inuit of the eastern Northwest Territories and the Government of Canada. It marked the end of some 30 years of effort by the Inuit through the Tungavik Federation of Nunavut (TFN) to claim "Our Land" (Nunavut) and to assume responsibility for their land and their way of life. Aboriginal rights can no longer be forgotten. They are encoded for the Inuit in a unique agreement that is not only a land claim settlement but also a political, economic and social agreement that provides the right to local political control, the assurance of local benefit from economic development and the prime voice in social, cultural and educational matters.

The map of Canada is being redrawn. The Northwest Territories is to be divided, creating a new territory, with the eastern half being renamed Nunavut ("Our Land", in Inuktitut). The future territory covers almost 2 million square kilometres (some 770 000 square miles) - roughly the size of the European Community less the British Isles. Most of it will remain Crown land, subject to federal control, with the Inuit having joint control over land-use planning, wildlife, environmental protection, and rights to the offshore area. Nunavut will become a reality on 1 April 1999. On that date, the new government will go into operation. Inuktitut will be the working language of the government.

To provide the polar information community with background information on the development of Nunavut and the implementation of the agreement, we have compiled an annotated bibliography (Simpson et al. 1994). It was felt that such a bibliography would be useful to the polar community because of the many implications of the agreement for the Inuit and Canada as a nation. On a broader perspective Nunavut will be an important inspiration for other aborigine groups in other parts of the world. It differs in many respects from earlier settlements in Alaska (Alaska Native Claims Settlement Act 1971) and Greenland, which achieved Home Rule in 1980. This paper will briefly consider the implications of the *Nunavut Land Claim Agreement* for the Inuit residents of the new territory.

Implications for the Inuit

Nunavut represents a new relationship of governments with an aboriginal group. For the first time, a provincial or territorial government will speak largely on behalf of one group of native people, as opposed to the centralized government control that has been the pattern for Indian and other aboriginal lands for 150 years.

The North is often referred to as "Canada's colonies". While Inuit have never been restricted by treaty agreements, unlike Indian bands, they have nevertheless been governed in "colonial" style from a remote southern capital, Ottawa. The Nunavut Agreement moves much of the responsibility for the future, out of Ottawa, into the hands of the Inuit. In effect, it will mean self-government for the Inuit people because of the Inuit majority living in Nunavut Territory - some 17 500 of a total population of about 22 000.

The western part of the Northwest Territories-the Mackenzie Valley and western Arctic, provisionally known as "Denendeh" – will continue under a smaller territorial government based in Yellowknife. A number of Dene and Metis land claims are recently settled or are in negotiation, and will influence the future course of government in the region.

Local Government

The Agreement provides a settlement protected by the sections of the Constitution Act 1982 relating to aboriginal rights. It cannot be revoked or amended without the consent of all parties involved. Residents are generally subject to the laws of Canada but the Agreement provides for territorial government by an elected Legislative Assembly with the power to pass its own laws.

The Federal Government will make a capital transfer of $1.148 billion (Canadian) over 14 years to the Nunavut Trust. The Trust may borrow against this capital as it sees fit. It will also receive and spend royalty payments from natural resource developments. The costs of the long negotiation process for the Agreement will be returned to Canada from interest earned on the capital.

With financing in place, a seat of government will be selected. Functions of government may be dispersed at several centres in keeping with the grassroots approach- or "Lichen-roots" in the common phrase of the North- to decision-making favoured by the Inuit. This approach involves reaching consensus with input from as much of the community as possible. To maintain it in future, the Nunavut Government must try to ensure that the proportion of Inuit employed in government matches that in the population as a whole.

All registered Inuit will receive rights and benefits, and may vote when necessary, but the civil rights of all Northerners, of any ethnic origin, are recognized, and residency is open to non-Inuit citizens. Only registered Inuit may hold Inuit lands, but both they and others may make use of, for example, sub-surface mineral rights. Inuit do not require hunting permits, but non-Inuit who meet residency requirements may apply for them. Non-Inuit northern residents will continue to operate businesses and provide services as before.

Inuit will screen projects throughout Nunavut to determine whether there is a need for a review of their impact on the ecosystem or on socio-economic conditions, through the Nunavut Impact Review Board. This Board and others such as Wildlife, Water and Planning, must include a high percentage of northern members and in many cases must be chaired by a Nunavut resident. Many questions will be settled through a public hearing mechanism and decisions will in most cases be recorded in an "Inuit Impact and Benefit Agreement" (IIBA) for the particular situation.

Land Title and use

Inuit will acquire the title to about 18% of the land area of Nunavut, in exchange for giving up any future claim to aboriginal title to lands and waters anywhere in Canada. The quantum of Inuit-owned land that has been identified for each community,along with the rights to marine areas and the use of the ice, provide a secure base for the traditional subsistence activities-hunting, trapping and fishing-and for carving, which produces cash income. Rights to cut carving stone are set out in the Agreement.

Inuit also have rights of first refusal of developments such as tourist facilities (fishing lodges, guiding services). Inuit lands will be essentially free of taxes, though as the Agreement notes, the details may only be clarified when a real estate transaction occurs and those involved attempt to file tax returns.

The lands themselves were selected during the Inuit Land Identification Project (ILP), which was carried out over several years in each region and community, with the involvement of all residents in recording land use in the Nunavut Atlas (Riewe 1992). Each community then selected a land quantum, based on the data recorded in the Atlas. The right to hunt, without a permit, on landfast ice and on ice beyond the conventional legal offshore limits, is unique in any land settlement. It recognizes traditional Inuit use of these areas, and reinforces Canada's claim to sovereignty over Arctic waters. The boundaries of Nunavut, most specifically on the Baffin coast, are drawn so as to include the ice.

Wildlife and Conservation

Inuit will retain the right to hunt, trap and fish throughout Nunavut, including the landfast ice and offshore waters. They will also have responsibility for wildlife management throughout Nunavut through the Nunavut Wildlife Management Board. The Board will regulate traditional harvesting up to specified limits to meet basic subsistence needs. It will adjust these limits as necessary as the Inuit population increases and will do so in keeping with the principles of wildlife conservation.

In order to provide current data for setting harvest limits, a Wildlife Harvest Study will be undertaken in each of the three regions (Baffin, Keewatin and Kitikmeot) within three years, and a special study of the bowhead whale within five years. The list of species for which Inuit have full harvesting rights is to stand for twenty years and can only be amended every five years thereafter, with residents' consent. Inuit have primary rights to the wildlife harvest, but the Agreement allows anyone who needs to hunt to avoid starvation, to do so.

Economics

Inuit will benefit from a share in the royalties from resource developments (oil, gas, minerals etc.). The Nunavut Trust will receive from each development one-half of the first $2 000 000 in royalties and then 5% of the remainder each year. These monies will then be

spent in the North, by the Trust, while the Federal Government will still receive its share.

At the local level residents will benefit from the Inuit Impact and Benefit Agreement (IIBA) to be negotiated for each development. Each IIBA will provide for the right to apply for government contracts, start-up assistance to local businesses, job training, work schedules that allow for traditional activities (such as hunting), use of local languages in the workplace, access to facilities such as airstrips, and protection of outpost camps and archaeological and historic sites. Compensation will be agreed on damages to wildlife and resources that may result from mining or events such as oil spills.

Culture and lifestyle

Nunavut means a government that will reflect the Inuit culture, values and approach to decision making. The Nunavut Social Development Council will report annually on social and cultural matters and will advise the Legislature on anything requiring action. The Inuit Heritage Trust will have the power to control use of archaeological specimens and sites, and to ensure that Inuit are involved in all archaeological work. Wherever possible, cultural artifacts will stay in the North, either *in situ* or in northern museums and collections. The Trust may also propose changes in place-names, from introduced names to traditional or locally-preferred forms.

Inuktitut will be the language of government and one of the languages of education. School curricula will be locally designed to reflect local culture.

The mechanisms of government may take account of local circumstances of distance, weather and communication. Some Boards may hold emergency meetings with one member "present" by telephone if necessary to make up a quorum, if the member is unable to reach the meeting in time. Priority will be given to matters of local urgency; one named in the Agreement is the cleanup of waste from military installations in the Kitikmeot (Central Arctic) region. The various territorial and national parks and conservation areas in the region are to be managed in a way that reflects Inuit history and presence on the land.

Conclusion

The struggle for Nunavut has been long and arduous. In our bibliography we have documented the roots of the idea, the negotiations, the obstacles and triumphs. Nunavut (Our Land) is the affirmation of a strong and unique cultural identity, a statement that the Inuit are "Masters in our own land".

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New Directions at Canada's Department of Indian Affairs and Northern Development

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Abstract: Canada's federal Department of Indian Affairs and Northern Development is undergoing enormous changes. Many of its programs and responsibilities are being assumed by Canada's Aboriginal* peoples and by the territorial governments of the Northwest Territories and the Yukon. What the role of the Department will be in the future, if it is even to have a future, is unknown. Despite these uncertainties, Indian Affairs and Northern Development is playing a major role in a number of exciting and important government initiatives. Two of these are the Arctic Environmental Strategy and the establishment of the new northern territory of Nunavut.

Key words: Canada Department of Indian Affairs and Northern Development, Arctic environment, Nunavut

* Documents and publications of the Department of Indian Affairs and Northern Development usually capitalize words such as "Aboriginal" and "Native" as a sign of respect for the Department's clients.

Introduction

Since the 1980s, Canada's Department of Indian Affairs and Northern Development has undergone great changes in its responsibilities and activities. The Department is less and less responsible for the direct delivery of services to Native peoples. Instead, it is transferring funding to Aboriginal communities so they may deliver their own services. Indian Affairs and Northern Development continues to have administrative responsibility for 95 per cent of the land in Canada's two northern territories. But this function is changing as well, as the governments of the Northwest Territories and the Yukon take more control over their own natural resources.

The future size, structure and mandate of the Department is unknown. Indeed, its continued existence is in question. Despite this, Indian Affairs and Northern Development continues to play an important part in a number of government initiatives that are having a profound effect on Canada's First Nations and northern regions. Two of these are the Arctic Environmental Strategy and the establishment of a new northern territory called Nunavut.

New Directions at Indian Affairs and Northern Development

In March of 1994, employees of the Department of Indian Affairs and Northern Development were reminded again of the uncertainty of their future. The Minister, the Honourable Ron Irwin, rose in the Canadian House of Commons during Question Period to announce that the Department would be closing, and the Manitoba regional office would be the first in the country to transfer all departmental responsibilities to Aboriginal communities. (Canada 1994a) No further details were forthcoming: no time frames, no concrete plans for reduction of staff, no details even on how the Manitoba region would accomplish its goal.

Large scale change, program cuts and staff reductions have been the order of business for some years at Indian Affairs and Northern Development. Three examples illustrate the extent of the transformation:

1. in 1976, the Department had over 8600 employees, not including 4600 working in the Parks Canada Program that was part of Indian Affairs and Northern Development at the time, (Canada 1974). Today, after another round of staff cuts at the end of 1993, the Department has a total of 3400 employees across Canada, (Canada 1994b 1-5).
2. in 1986, the Department had an Economic Development Program, with over 300 employees answering to an Assistant Deputy Minister. (Canada 1987, 1-5, 2-51). Today, only a handful of departmental employees deal with First Nations economic development, while the government programs impacting these issues are delivered by other departments, such as Industry Canada (Supply and Services Canada 1993 , p. 208)
3. in the mid 1980s, the federal government approved the use of Alternative Funding Arrangements for Indian communities receiving programs as a result of treaty rights. These Arrangements allow Indian band councils to take as much responsibility as possible for

redesigning Indian Affairs programs delivered in their communities, and for reallocating funding to other community needs. Any Indian community can arrange an Alternative Funding Arrangement, provided they meet certain criteria, such as demonstrated sound management practices, (Canada 1994b, 2-79). By 1989, 3 per cent of eligible Indian Affairs and Northern Development programs were being delivered under Alternative Funding Arrangements. By 1993, this figure was at 18 per cent, (Canada 1994b, 2-81).

Despite the uncertainty, the decreasing human resources, the closure of offices and programs, Indian Affairs and Northern Development is probably carrying out some of the most important work ever accomplished in its history. Two projects, the Arctic Environmental Strategy (AES), and preparation for the creation of Nunavut, illustrate this point well.

Canada's Arctic Environmental Strategy

Canada's Arctic encompasses approximately 40 per cent of the country's total land mass (Indian and Northern Affairs Canada 1991, p. 20). It relies on water sources which, for the most part, originate outside its borders, frequently in areas of industrialization or agricultural development. (Indian and Northern Affairs Canada 1991, p. 10) Pollutants from southern and international sources find their way into its air, soil and water. Much of its population continues to harvest its own food and to take its water directly from local sources. (Indian and Northern Affairs Canada 1991, p. 4, 13)

The AES is a perfect example of the changing role of Indian Affairs and Northern Development. The Department's function in the Strategy is one of facilitator, banker and secretary. The AES is a six year, $100 million project within Canada's national environmental Green Plan. The project began in 1991 and will end in 1997. It is now into its fourth year (Indian and Northern Affairs Canada 1994). The Strategy sets out "to preserve and enhance the integrity, health, biodiversity, and productivity of our Arctic ecosystems for the benefit of present and future generations." (Indian and Northern Affairs Canada 1991, p. 2), and is divided into four action programs:

A. Action on Contaminants: their identification and levels in the North, their sources and methods of transmission, and their affects. (Indian and Northern Affairs Canada 1991, p. 4)
B. Action on Waste: identification and clean-up of Arctic waste sites. (Indian and Northern Affairs Canada 1991, p. 8)
C. Action on Water: establishing northern water quality and quantity monitoring. (Indian and Northern Affairs Canada 1991, p. 10)
D. Action on Environment/Economy Integration: encouraging community environmental action plans and resource management plans, and establishing a Northern Information Network for both scientific and traditional knowledge. (Indian and Northern Affairs Canada 1991, p.14)

The Strategy has had a number of achievements to date.

Action on contaminants

In the first three years, $13 million was spent on primary contaminants research conducted by government departments (federal and territorial), universities and Aboriginal organizations. Communication of research results to Aboriginal communities has been a priority, (R. Hurst, personal communication 1994). The identification of a number of international sources and methods of transmission for Arctic contaminants has necessitated Canada's search for international cooperation and action. Canada has completed, or is working on, a number of international pollution agreements and projects, especially with its circumpolar neighbours (Indian and Northern Affairs Canada 1994, p. 11)

Action on waste

More than 900 waste sites have been identified, almost 130 of which are considered, or suspected to be, hazardous. These sites include abandoned mines, closed commercial fishing camps, and community dumps. To date, over 400 sites have been cleaned up (R. Hurst, personal communication 1994, Indian and Northern Affairs Canada 1994, p. 5)

Action on water

For the first time ever, water quality studies are being carried out in the Arctic. An existing water quality monitoring network has also been rationalized to provide more comprehensive data. Baseline information now becoming available is providing valuable indications of where more work needs to be done to ensure a safe source of water for Northerners (R. Hurst, personal communication 1994)

Action on environment/economy integration

Funds are being provided for environmental action projects at the community level. These range from classroom worm composting projects to the establishment of recycling programs and the hiring of elders as environmental information officers (R. Hurst, personal communication 1994, Indian and Northern Affairs Canada 1994, p. 8-9). Many communities are developing and implementing resource management plans. This is encouraging the development and expansion of a market economy in the North, while supporting and protecting a subsistence economy (R. Hurst, personal communication 1994, Indian and Northern Affairs Canada 1994, p. 8-9). By the end of the Strategy's third year, in the Northwest Territories alone, more than 40 of the 62 communities had participated in 200 local environmental projects, and had completed, or were working on, resource

management plans (R. Hurst, personal communication 1994, Indian and Northern Affairs Canada 1994, p. 8-9).

Benefits of the Strategy

At the heart of the AES is a dedication to finding new ways of working with and for Northerners. The most important feature of the Strategy is the partnership it fosters between governments and Aboriginal organizations as a means of ensuring that Native concerns, priorities and knowledge are incorporated into the Strategy. All five northern Aboriginal organizations (the Inuit Circumpolar Conference, the Inuit Tapirisat of Canada, the Council of Yukon Indians, the Dene Nation and the Metis Nation) sit on the various committees that develop Strategy policy and direction, and decide on specific project support. Technology will continue to provide solutions to environmental issues, but the Strategy is also looking for new ways of resolving problems. In an effort to reduce exorbitant travel costs, the Action on Water program is making use of a network of lay samplers, community residents trained to take samples using standardized procedures (Indian and Northern Affairs Canada 1994, p. 4). While aiming to make economic development and environmental protection compatible through the Action on Environment/Economy Integration, the AES is itself a source of economic benefit, fostering the development of northern businesses and expertise, and providing a source for community employment (R. Hurst, personal communication 1994).

The role of the Department of Indian Affairs and Northern Development

The AES is a perfect example of the changing role of the Department of Indian Affairs and Northern Development. The Department is not actively involved in maintaining laboratories or a staff of northern scientists, as it might have been in the 1970s. It serves, however, as the administrative centre for the Strategy and implements all decisions and policies formulated by the Strategy's committees. The Department also represents the Canadian government in the work on international cooperation for the control of Arctic contaminants. Indian Affairs and Northern Development chairs the international Arctic Monitoring and Assessment Program (AMAP), and co-chairs with Sweden the Task Force on Persistent Organic Pollutants under the United Nations Economic Commission for Europe (Indian and Northern Affairs Canada 1994, p. 11).

One of the Strategy's goals has been to develop a Northern Information Network (NIN), to facilitate the sharing of information related to Arctic environmental issues, as well as to integrate scientific information and traditional knowledge. Indian Affairs and Northern Development has been working to create and coordinate this Network. To date, it has developed, and is distributing a computerized inventory of c.450 geo-referenced databases on northern Canada. A NIN electronic bulletin board promotes information exchange (Indian and Northern Affairs 1991, p. 15, 1994, p. 9).

A New Territory Called Nunavut

Another major government initiative affecting the North in which the Department of Indian Affairs and Northern Development is playing a very active role in is the creation of the new territory and government of Nunavut. In April 1990, the Government of Canada, represented by Indian Affairs and Northern Development, the Government of the Northwest Territories and the Inuit Tungavik Federation of Nunavut (TFN) signed an Agreement-in-Principle for the TFN land claim agreement in Canada's eastern arctic. The Agreement affirmed the willingness of the three parties to work together towards the creation of a separate territory, with its own government, to be known as Nunavut, "Our Land" in Inuktitut (Indian and Northern Affairs June 1992, p. 1-2). This document was the culmination of political discussion and negotiation that began in the 1950s.

In 1982, the Government of the Northwest Territories sponsored a plebiscite in which 53 per cent of eligible voters participated. 56.5 per cent of the votes cast were in favour of dividing the Northwest Territories (Indian and Northern Affairs June 1992, p. 1). In June of 1993, Canada's Parliament passed two historic pieces of legislation, the *Nunavut Land Claims Agreement Act* and *An Act to Establish a Territory to be Known as Nunavut.*

The creation of a new Government

The basis for the preparation and planning leading up to the establishment of Nunavut was laid out in the Nunavut Political Accord, initialled in April 1992, again by the Minister of Indian Affairs and Northern Development, the Government of the Northwest Territories and the Tungavik Federation of Nunavut (now called Nunavut Tunngavik Inc. or NTI). By April 1, 1999, the Nunavut Government is to have the power to establish and maintain a Legislative Assembly and Executive Council, and is to assume financial, human resource and justice functions (Canada 1992, part 7.1). A transitional period will follow, during which the Nunavut Government will prepare for the transfer of all remaining programs to its jurisdiction by 2010. Included in the preparation for the final transfer will be the training of residents of Nunavut to undertake the delivery of these programs themselves (W. Attwood, personal communication 1994).

The Nunavut Political Accord provided for the establishment of a Nunavut Implementation Commission within six months of the passage of the *Nunavut Act.* The Implementation Commission, named in December 1993, has ten members; nine commissioners chosen from lists of candidates prepared by the three signatories of the Accord, and a Chief Commissioner acceptable to

all three parties (Canada 1992, part 6). The Chief Commissioner is Mr. John Amagoalik, an Inuit politician and constitutional specialist who has been on the political scene for many years (Canada 1993, p. 1).

The Nunavut Implementation Commission's responsibilities will be to advise the three signatories on a number of issues (Canada 1992, part 6.6) including:

- a timetable for the transfer of all programs to the Government of Nunavut, and arrangements by which these programs will be provided by other governments and agencies until such time as the new government can assume them,
- the process for holding the first election of the Nunavut Government, and for creating electoral districts in the territory,
- a training program that will prepare residents of Nunavut to assume the maximum number of positions possible in the new government,
- a method for selecting a site for the capital of Nunavut,
- plans for dividing assets and liabilities between the Government of the Northwest Territories and the Government of Nunavut,
- the capital infrastructure needs of the new government and a schedule of construction,
- an organizational design for the first Government of Nunavut.

One of the first duties of the Implementation Commission is to provide the advice necessary to allow the Minister of Indian Affairs and Northern Development to present to the Federal Cabinet by March 31, 1995 an estimate of costs for the establishment of Nunavut. An interim Commissioner for Nunavut will also be named in 1995, to represent the future territory in negotiations with the federal and Northwest Territories governments (W. Attwood, personal communication 1994). At the same time as the work of creating Nunavut is going on, the Government of the Northwest Territories is preparing itself to develop a new constitution and organizational design, to serve the remaining western portion of the Northwest Territories (Northwest Territories 1993, p.1).

Besides acting as negotiator and representative for the Government of Canada in the planning for Nunavut, the Department is once again acting as banker and secretar. It is organizing the participation of other federal departments, coordinating capital planning, and developing the federal funding arrangements for both the Nunavut and Northwest Territories governments.

The Future

The future of the Department of Indian Affairs and Northern Development is uncertain. It may become a small department developing federal government policy on Aboriginal and northern issues. It may be "downsized" into a small funding agency, transferring federal funds to Aboriginal communities and northern governments. It may disappear.

Whatever the future holds for the Department, it is playing a key role today through such initiatives as the Arctic Environmental Strategy and the planning for Nunavut. Indian Affairs and Northern Development, in partnership with its clients, is truly fulfilling its mission statement: "Working Together to Make Canada a better place for First Nations and Northern Peoples."

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Public Libraries serving diverse populations in the North

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Abstract: The Saami are an indigenous people in northern Scandinavia with an estimated population of 70 000 - 100 000. Their main sources of livelihood are reindeer herding and tourism. The cooperation between Saami people from different states has always been crucial in Saami politics. The Saami people has a flag, a national day and languages of its own. The Saami people have special needs as library users. The illiteracy in Saami among the adult population is a problem but because of the Saami Language Law the situation is improving, at least in Finland and Norway. The amount of literature published in Saami is small with only a few new titles a year. The Saami are not used to reading in their mother language. There is also a shortage of librarians able to speak Saami. The Saami population lives in distant scattered settlement areas and are served by the network of special Saami libraries in respective countries in Scandinavia. The recorded books in Saami-project is an attempt to meet the special needs of the minority. The mobile libraries in Scandinavia operating across the national borders are also importan in serving the scattered inhabitants. The project, called Literature to Saami villages, is carried out in Sweden and is another example of efforts to secure the Saami population as library users.

Key words: library services, the Saami people, minorities, Scandinavia

Introduction

The Saami region lies in the northern territory of four countries: Sweden, Norway, and Finland and the Kola Peninsula in Russia. The estimated number of Saami people is 70-100 000 (Sammallahti 1985, p. 154). They are the indigenous people whose living area has been reduced to the present out-of-the-way corner in the far north. The Saami people themselves talk about the colonialism under whichthey have suffered for centuries. The main source of livelihood is reindeer herding, but tourism and the sale of Saami handicraft products are important sources of income. In Russia the forced transfers of populations have had tragic consequences for the Saami people (Sammallahti 1985, Fig. 1, p. 165; Valkeapää 1983, Fig. 2).

Even today the annual migration from inland winter ranges to the summer pastures on the seashore plays an important part in the life of herdsmen, in Norway. Until the end of the last century the Saami people were able to graze their reindeer freely without having to take notice of state borders. When, for political reasons borders were closed, the connection between inland and seashore was cut (Aikio 1990, pp. 60-61).

During the last few years the awareness of being Saami and the possibilities to develop one's own culture have improved. The cooperation between Saami people from different states has always been crucial in Saami politics. The Saami people have their own language, flag and national day. They also have their own professional theatre. At the moment the Saami people in Finland are working on the country's legislation to ensure the right of cultural autonomy in order to influence the development of their own.

The Saami minority as users of the Library Services

The position of the Saami language

The Saami language has been dying slowly but now it is starting to recover due to recent legislation and more active teaching of the language in Saami schools. Many of those who are middle-aged today had to learn the state language at school and forgot their mother tongue more or less completely. The Saami language became a language spoken only at home. This is the reason why so many Saami people cannot read their mother tongue. The Saami Language Law in Finland (1992) gave the Saami people the right to use their mother tongue when talking to officials in their home district. The same law applies in Norway but not in Sweden. Librarians and libraries are governed by these laws but there is a shortage of librarians able to speak Saami. A further problem is that the Saami language has several different dialects which are not understood by other Saami speakers.

Saami Language literature

Still very little is published in the Saami language, as it is not profitable. Fortunately however there are still publishing companies in Norway, Sweden and Finland who carry on trying. The strongest support for Saami culture comes from Norway. Today most of the books published in Saami are for children but textbooks are

also an important area of publishing. However, very often even people who know Saami well still prefer to read books in the state language. To "force" people to use their language more, some reference works have been published only in Saami. One of the tasks is to encourage and stimulate the Saami people to read in their mother tongue. A rich and colourful oral tradition has always been a strong feature of the Saami culture, through which the culture has been passed from one generation to another. It could be that the libraries could benefit from this culture in some way as well.

However, the written culture is getting stronger. The number of items published in 1993 was:

- Saami language periodicals	1	magazine
	2	newspapers
- fiction	4	items
- children and youth literature	13	items
- non-fiction	22	items
- music material	7	items
- videos	1	items
- recorded books	1	item
- total	48	items

Audiovisual material and music are very important today.

The Saami Library Services in Scandinavia

The Saami minority lives scattered in different countries - Norway, Sweden, Russia and Finland. Inside each country the Saami people also live widely scattered in small villages at some distance from each other. Reindeer herding as a way of life also means living far from the big settlements. That is why it is so difficult to offer the Saami people a library service. Many Saamis have moved to the cities and it is said that the biggest Saami village today is Oslo.

Special Saami Libraries

All these countries have a network of public - municipal - libraries. In Norway and Finland there are also special Saami libraries, with in Sweden a Saami library advisory officer. These libraries give support to the public libraries in the Saami region. In Finland, the special Saami library in Rovaniemi is outside the Saami Region making direct contact with the Saami people difficult. In Rovaniemi the bibliographical work and the information service are very important but we are also trying to keep in touch with libraries in the Saami region.

Active library cooperation and other projects

The special Saami libraries of Northern Scandinavia have tried to become more efficient through a policy of active cooperation with each other. An important example of this is the Saami National Bibliography.

The present position of the Saami people and their language is always taken into account. The libraries try to contact the Saami people in several different ways, using means which are unusual for libraries and go beyond the boundaries of traditional library activities. One method has been the recording of Saami language books on cassettes jointly produced by the Nordic Saami libraries. The Swedish Saami library consultant, IngaBritt Blindh, has an interesting project called "Books to the Saami villages" where the books are taken to the reindeer herdsmen. A more traditional way of working has been the mobile libraries, which are used in all three Nordic countries.

The growing enthusiasm for Saami as a living language can be seen in the most northern part of Finnish Lapland. Here there is a project to use puppets to introduce Saami children and young people to Saami language stories and tradition.

Recorded books in Saami

The normal task of the library is to lend books, not to produce them. We decided to think about it a bit further. The idea of recorded books seemed promising because many of the Saami people understand the spoken language although they cannot read it. Unfortunately none of the commercial publishers wanted to produce them. So we undertook the task ourselves using money from Nordic sources (£27 000). The task of the libraries was to chose the recordable texts in Saami, find suitable co-workers and readers, act as producers, organize advertising and take care of delivery (Alanen *et al.* 1993).

It was easy for libraries to find the co-workers because one of the Saami associations became enthusiastically involved. It was seen as an important event and the Saami people who worked for the project were well motivated. One of the writers himself was ready to read his text. During the project nine different recorded books were produced in five different Saami dialects, among which were language groups with only a couple of hundred speakers. We chose the books on the basis that they would connect in the best possible way with the Saami way of life, both present and past. The books were sent to the four different state regions, initially to the schools, nursery schools, old people's homes, hospitals and libraries.

The feedback has been positive. The project has also stimulated other publishers to provide recorded books in the Saami language. Thanks to the project the Saami people have understood the meaning of libraries in the development of their culture and they are ready to cooperate in the future as well.

Nordic joint mobile libraries

Each municipality in the Saami district in Finland has a mobile library of its own but there are also the joint Nordic mobile libraries. One of them is the Närp-bus which serves the western region and belongs to all three countries. It started as an experiment in 1979. The other one belongs jointly to Finland and Norway. This

works in the eastern area and began in 1989 in Utsjoki. The mobile library is a very pleasant service from the customers point of view. It brings its services to his doorstep. The material the bus provides is mostly in three or four languages: Finnish, Saami, Norwegian and Swedish. The mobile library staff have to know several languages. One bus is based in Finland, the other in Norway.

The buses have been able to reach new groups of customers, such as the older people. The borrowing of Saami books has increased. The mobile library is also seen as a social meeting place, especially now when many of the small village shops have closed down. The buses also stop at the small village schools, where they are welcome visitors (Pieski 1992, p. 38-39). These border region buses also bring together different cultures when they move from one country to another. They succeed extremely well in serving the population of the border region, because everybody can find books in their own language. At the same time they encourage people unfamiliar with libraries to use them.

Books to the Saami villages

This project was undertaken in Sweden in 1990-1991 and represents an example of so-called "seeking" library activity, which is common in the Swedish public library system. In this project the books were brought to reindeer herding regions, to the Lapland villages (Saami siita). Nowadays these Saami villages are almost fixed workplaces of the reindeer herdsmen in the wilderness regions and people remain there all year round. The Saami library consultant IngaBritt Blindh obtained the funding for the project from outside sources.

The aim of the project was to improve the library services of the Saami people by establishing permanent libraries in the reindeer herding localities, which the local municipal libraries would then take care of. The Swedish Saami Society provided the idea for the project and also took part in it.

The library consultant informed different organizations, societies and individuals about the project and tried to find co-workers. First she took boxes of books to 44 Saami villages. In one box there were about 40 books of Saami literature, some of them in the Saami language. The visits covered a very large region, in fact one-quarter of Sweden. The consultant had contacts who took care of, and followed the use of, the collection in each Saami village. Apart from visiting the places herself the consultant also had telephone connections to the villages. Thanks to this project some of the municipal libraries have started to take care of these working place libraries. The library consultant also interviewed the Saami village reindeer herdsmen to find out about their reading habits as part of the project (Renborg 1993, p. 10-12).

A final word

The public libraries can give remarkable support to minority cultures. For the scattered populations they carry an important responsibility, because they form a ready functioning net across the regions. They can act in cooperation, but they can effectively make contacts with the outside world as well. Courage and innovative thinking are needed, as well as the tried and tested ways of the library world, to promote equality and variety within cultures.

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Delivery of health science information to rural Alaska: practices and problems

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Abstract: The Health Sciences Information Service (HSIS) of the University of Alaska Anchorage's Consortium Library serves as the hospital library for all of rural Alaska. It utilizes every possible means to deliver medical and health information, including mail, telephone, telefacsimile, and computer. HSIS is currently conducting a multi-year project focused on developing and using computer technology for information delivery to remote areas. Now in its final year, the project has highlighted technical and practical difficulties commonly encountered when introducing technology to rural areas. These include lack of equipment, technology timidity, and poor telecommunications. HSIS has implemented four essential project components to address these problems: (1) send a trainer who enjoys the work, knows the subject area, is able to communicate on a variety of levels through a range of health-care providers; (2) send a computer technician to address on-site technical problems; (3) open and maintain lines of communication by making extensive contacts prior to arrival, having project members stay several days, and following-up with information of interest to individuals at the site; and (4) return to the site several times a year for follow-up training.

Key words: health, information delivery, rural, Alaska, remote sites, computer technology

Introduction

In Alaska, as in many sparsely populated regions, health care is dispensed from regional centres. Physicians at the centres are available to advise trained health aides in remote villages, and patients needing more complex care are transported into the regional centre. The Health Sciences Information Service (HSIS) of the University of Alaska Anchorage (UAA) serves as the "hospital" library for these regional centres, as well as for the majority of Alaska health-care providers. For the past several years, HSIS has been involved in a project to improve delivery of information to the "bush" through the use of telecommunications and micro-computers. This paper describes progress so far.

Hospitals in Alaska

There are 27 hospitals in Alaska. The five largest, those with over 100 beds, are located in Anchorage or Fairbanks. The other hospitals range in size from 9 beds to 92 beds. Five of the smaller hospitals are run by the Native Regional Corporations under contract to the federal government. The remainder are private and/or non-profit. Five of Alaska's hospitals are in villages that cannot be reached by road and are thus true "bush" hospitals. Seven are served by the ferry system, the Alaska Marine Highway, and so may be considered to be on the road system. However, all except those in Anchorage and Fairbanks can be classified as rural.

Alaska's rural hospitals, especially those away from the road system, have difficulty retaining their trained medical staff. Isolation from colleagues and from such resources as medical libraries is often cited as a reason for the decision to leave the bush after a few years. This turnover is also a major problem from our perspective as information providers, because we lose users almost as quickly as we introduce them to our services.

Medical libraries

In all of Alaska there are only six professionally staffed medical (or hospital) libraries. Of these, four are located in Anchorage and, with the exception of HSIS, only one has a full-time medical librarian. HSIS serves as the medical library for all of the health-care providers in the state, except those in the five institutions with their own libraries. HSIS also supports these five hospital libraries.

HSIS

HSIS has a long history. It began 27 years ago, when the federally funded Alaska Area Native Health Service established the first medical library in Alaska. Supported by a series of grants from the National Library of Medicine (NLM), the library's clientele soon expanded to include all health-care providers in Alaska. Funding gradually shifted from the federal to the state government and then, in 1992, HSIS was transferred to

its current administrative location within the UAA Consortium Library. The library's physical location has changed as well. In 1976 the collection moved to the UAA campus, and the monographs were merged into the Consortium Library collection. To this day, the periodicals are on separate floors. Which titles are on which floor is based on historical, not necessarily logical reasons, much to the confusion of our users.

The Consortium Library took over the funding of the collection in the late 1970s. The health sciences collection is currently ranked third in the Pacific Northwest states, directly behind the medical school libraries in Oregon and Washington. HSIS is an active member of the National Network of Libraries of Medicine and works closely with the Regional Medical Library at the University of Washington.

The National Library of Medicine was very supportive of HSIS in its early years and is now particularly interested in its focus on "rural outreach." NLM has recently funded two "outreach" grants in Alaska. The first was to the Alaska Native Medical Centre to equip five rural hospitals for searching the NLM databases via their user-friendly gateway called GRATEFUL MED. The second grant was made to HSIS for a demonstration project, now in its last year. Its objectives were 1) to equip five rural hospitals with computers, modems, and software; 2) to support training in the use of the equipment and NLM systems; and 3) to evaluate the subsequent usage. Because of falling computer prices and the fact that some hospitals have not needed the entire equipment package, enough money remains in the grant to equip every hospital outside of Fairbanks and Anchorage, and not just the five originally proposed.

Results

Results of the projects so far have been mixed. The first grant funded equipment and a single visit by a trainer to each of the five western-most rural hospitals, all run through the Indian Health Service. The project consisted of one on-site visit per institution to hook up the equipment, show them how to use it, show them how to use GRATEFUL MED, and leave. We know there was little use made of the system, because HSIS did not receive the article requests from the GRATEFUL MED searches. The project essentially made no impact.

Fortunately, the second grant -- our grant -- has run for several years. This has given us the luxury of returning to the sites. After 18 months of focusing on our own project's hospitals, our Principal Investigator, Jeraldine van den Top, the head of HSIS, visited Nome and Kotzebue. Hospitals in these two regional centres had participated in the one-visit project funded by the first grant. Jeraldine found that no one used GRATEFUL MED because the commercial telecommunications were so poor that they simply could not get connected. However, when she tried dialling-in over the University of Alaska Computer system she was able to connect via the Internet. The same situation was found to exist in Dillingham, another of the first project's sites, on a visit this past fall.

Clearly, the answer is to get the hospitals onto the University of Alaska's computer network. While technologically no problem, it is currently impossible because of political, economic, and managerial difficulties. We are continuing to work on a solution, but in the meantime have implemented Plan B, which shows great promise. Within the past few weeks, we have sent a computer technician along with a trainer to three of the sites experiencing telecommunications problems. We have installed correcting modems, which seem to be working. And we have generated a lot of good will because our computer technician spent a couple of days helping them out with their other technical problems - a welcome assistance in the bush!

In addition to sending the computer doctor along with the trainer, we have recently revised our training visits. Instead of the head of HSIS, we are sending a subject specialist with a talent for communicating with all levels of health-care providers. Before he arrives he arranges to visit all health-care providers in the town, and he spends several days at each site. This means he is available at unusual hours. He has done a demonstration in the early morning, and he makes appointments with physicians whenever they are available, often after 7 pm. He sees the hospital administrators, the dentists, the nurses -- literally anyone involved in health care. And he follows up with telephone calls, articles of interest, and any other way he can to keep the lines of communication open.

Conclusions

We believe we have found four rules for improving the introduction of information technology to rural or bush health-care providers:

i. Utilize a trainer who knows the subject, enjoys the contacts, and can communicate with anyone they meet in a health-care setting.

ii. If there are technical problems, take a computer technician along. The trainer can spend all his or her time training, not fumbling with the computer. If the technician cannot make the system work, you at least know it has been looked at by an expert. Meanwhile the locals are thankful for your efforts on their behalf.

iii. Make extensive contacts before you arrive, stay several days, and follow-up with information you know will be of interest.

iv. Return to the site a couple of times a year. Because these institutions have a regular turnover of their professional staff, it is important to get there soon after they arrive.

Juvenile Polar Literature: An Assessment of Holdings in Libraries

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Abstract: The Goldthwait Polar Library received the personal polar library of Ann and Emanuel Rudolph. Ann and Rudy were avid book collectors and their "polar room" consisted of over 2000 books. They were particularly interested in children's literature and part of the collection contains over 300 fiction and non-fiction titles for children. The Goldthwait Polar Library's collection previously contained little juvenile literature. Without knowing what juvenile titles other libraries hold, it is difficult to assess the strengths and weaknesses of the collection. Using *PolarPac3*, searches were conducted to determine what is available in juvenile polar literature. The holdings of other libraries are compared to the holdings of the newly acquired juvenile collection of the Goldthwait Polar Library.

Key words: juvenile polar literature, acquisirions policy

Introduction

Ann and Emanuel Rudolph shared a passion for books and were avid collectors of all sorts of books. In fact, they collected so many books, that in 1987 they purchased the house next door to them to hold their increasing collections. Throughout their lifetimes, they amassed over 53 300 books. They vigorously collected history of science books, botanical books, books on buttons and button collecting, children's science books and polar literature. On the second floor of their original home, there was a "polar room" which contained their polar book collection.

Dr. Emanuel Rudolph was the third director of the Byrd Polar Research Center, then the Institute of Polar Studies, at The Ohio State University. Rudy and Ann maintained close ties with the Center and they were active in the Friends of the Byrd Polar Research Center organization. When Rudy died suddenly in 1992, a year after Ann, the Goldthwait Polar Library (GPL) received their entire polar library. Over eighty cartons of books were donated to the GPL, totalling approximately 2000 titles. The rest of their books were donated to The Ohio State University Libraries and the Herbarium Library of the Plant Biology Department at the university.

The Byrd Center wanted to maintain their personal polar collection as a separate entity and thus designated the books with *AER*. In each book, on the verso of the title page, the Rudolphs pencilled in a unique accession number, the date the book was purchased, where it was purchased, and the price they paid for it. They also kept a shelflist card for each book, as Ann was a librarian. Needless to say, the books were well loved and were meticulously cared for.

Part of their polar library contained over 300 fiction and non-fiction titles for children. The Goldthwait Polar Library's collection previously held very little juvenile literature. It is not surprising that two of the titles in the GPL's collection, of only a handful of juvenile books, are about Rear Admiral Byrd. The library owns the book, *Paramount's Newsreel Men With Admiral Byrd in Little America* (1934), which was donated to the library by the Rudolphs years earlier, and *Igloo*, by Jane Brevoort Walden (1931), a fictionalized account of the adventures of the Admiral's famous fox terrier.

While suspecting that the *AER* juvenile collection is a fairly thorough collection, it is nonetheless difficult to determine the strengths and weaknesses of the collection without knowing what juvenile titles other libraries own. With that it mind, searches were conducted using *PolarPac3* to determine what is available in the realm of juvenile polar literature. The holdings of other libraries are compared to the holdings of this newly acquired juvenile collection of the Goldthwait Polar Library. While not diminishing the role of fiction in a children's collection, this study focuses predominantly on the non-fiction titles.

Title Searches in *PolarPac3*

As a starting point, each *AER* juvenile title was searched in the *PolarPac3* CD-ROM. MARC records and holdings were printed for each book. The *AER* collection contains 303 titles; 199 non-fiction and 104 fiction books. These numbers exclude different editions of the same titles. Of the 199 non-fiction titles, 135 titles (68%) were found in the database, 64 titles (32%) were not found in *PolarPac3*. Of the 104 fiction titles, 74 titles (71%) were found in the database; 30 titles (29%) were not found. Nine libraries had titles in common with the *AER* collection in varying degrees: University of Alaska Fairbanks Library; Alaska State Library; Anchorage Municipal Library; University of Alaska

Anchorage Library; Scott Polar Research Institute Library; Indian and Northern Affairs Library; Dartmouth College Library; Alaska Resources Library and the U.S. Fish and Wildlife Library. (Table I)

Table I. Comparison of *AER* titles and other libraries' holdings.

Library	Non-fiction	Fiction	Total # of titles
GPL AER Collection	135	74	209
U AK Fairbanks Library	111	61	172
Alaska State Library	73	51	124
Anchorage Municipal Library	65	47	112
U AK Anchorage Library	54	20	74
SPRI Library	21	2	23
Indian & Northern Affairs Library	11	3	14
Dartmouth College Library	10	2	12
AK Resources Library	2	0	2
US Fish & Wildlife Library	1	0	1

While by no means definitive since the *AER* sample is small, the results in Table I may be indicative of each individual library's relative strengths or weaknesses in their juvenile holdings and collections. It is presumed that the U.S. Fish and Wildlife Library, the Alaska Resources Library and the Dartmouth College Library, much like the GPL, do not actively accession juvenile literature. The results indicate that the Scott Polar Research Institute Library does to a limited degree. The four other Alaskan libraries include juvenile literature prominently in their collection development strategies.

To determine what kind of books are in the *AER* non-fiction collection, the titles were then categorized by broad subject headings. (Table II) Although some of the titles could appropriately fit into one or more categories, each title was put into only one category.

Subject Searches in *PolarPac3*

Checking to see if other libraries hold the same titles we own, gives only a partial picture of what is actually available. Therefore, subject searches were also conducted to see how many hits there were in the database for juvenile polar literature. Keyword search terms were: 1. Alaska--Juvenile literature; 2. Arctic regions--Juvenile literature; 3. Polar regions--Juvenile literature; 4. Antarctic regions--Juvenile literature. Keyword searching was chosen as a means to also include subordinate and main subject headings, such as mammals, history, social life and customs, and description and travel. Admittedly, narrowing the terms to just four does not necessarily encompass all of the terms which could apply to polar literature, but it does provide a general overview.

In *PolarPac3* the term *Alaska* had 17 subject headings and produced the most matches of 94 hits. That was expected due to the large number of Alaskan libraries with holdings in the database. The same is true of *Arctic regions* as there were 18 subject headings which produced 60 titles. *Antarctic regions*, in comparison, had only 9 subject headings with a total of 36 records. There were only 5 keyword subject headings found with the term *Polar regions* and the total number of records was only 25.

Table II. Non-fiction *AER* titles by broad subject categories.

Alaska	17	Antarctica	17
Arctic Regions	11	Polar regions	9
Polar Animals	18	Eskimos	16
Canada	6	Greenland	1
Iceland	2	Siberia	1
Lapland	2	Dairying	1
NW Passage	1	N American Indians	2
Animal folklore	1	Dogs	3
Explorers	22	Expeditions	2
Whaling	2	Glaciers	1

GPL AER Juvenile Collection Profile

Using the information derived from Table II and the results from the *PolarPac3* subject searches, it is possible to construct a profile of the *AER* juvenile collection. Originally, it was assumed that the *AER* collection had a respectable amount of core literature about Alaska, but after examining the records in *PolarPac3*, this may not necessarily be true. Given the relatively small size of the GPL in comparison to some of the other larger libraries listed in Table I, the books pertaining to Alaska are welcome additions to the library. The *AER* Antarctic collection represents a substantial amount of what is available. The "heroes" of polar exploration are also well represented. There are three titles each about Byrd and Shackleton; two each on Nansen, Amundsen, Henson and Peary, and on Scott, and one on Eielson. General books relevant to both the arctic and the antarctic are also abundant. The "polar animal" books are clearly one of the strengths of the whole juvenile collection. The collection contains general books abou

the wildlife and habitats of animals in both polar regions, treated separately and together for comparison, and also specific books on individual species, such as polar bears and penguins.

Titles Not Found in *PolarPac3*

In the near future we will begin cataloguing those 94 titles not found in the *PolarPac3* database. Those which have matching records in the database have already been catalogued and are on the shelves. As a preliminary measure some of the titles have been searched in OCLC's Union Catalog via *FirstSearch*. Thus far, all of the books have had at least one record in that database, an encouraging sign, as that means the books are accessible to a large number of patrons. By scanning just the titles and the imprint information of these uncatalogued books it is apparent that they do not fit neatly into any one major subject category. Twenty-four of the titles have been designated for the *AER* rare book cabinets by virtue of their publication dates, or because that have been signed by the author, but there is no common thread that otherwise links these books together. The titles include general fact books about Antarctica, Greenland and Iceland, biographies on polar explorers and books about whaling, just to name a few.

Conclusions

The AER juvenile collection is a finite collection which is limited to books published between the years 1833 and 1990. In the past Juvenile literature did not coincide with the mission of the library. However, it is pertinent to note that we wanted to keep the AER juvenile collection as it was a large part of the Rudolphs' passion for books and reflects their understanding of the importance of children's literature. The GPL intends to periodically update the juvenile collection so that it may remain useful to elementary school teachers and children. In 1988, the Rudolphs prepared an unpublished annotated bibliography on Antarctic children's literature (Rudolph and Rudolph 1988). In the introduction to the bibliography they stated, "Inspiring the next generation to expand its horizons is the aim of many writers of the children's books". The books in the *AER* children's polar collection do just that, as they permit readers to discover places and people they do not know and perhaps furnish them with a desire to learn more about them. This sentiment does relate directly to the mission of the Goldthwait Polar Library and the Byrd Center is indeed fortunate to be the recipient of the Rudolphs' treasures.

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Just kids stuff? The place of children's books in a polar collection

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Abstract: Librarians who specialise in children's literature are all too familiar with the preconceptions of juvenile literature as being inferior in quality and importance to adult literature. Juvenile polar literature does have a place in the academic polar collection as a resource for academics, researchers and information professionals. An extensive polar collection that does not include juvenile literature may be missing an important resource. Polar librarians should ensure that juvenile literature is built into the collection development policy.

Key words: Juvenilia, imperialism, collection development

Reflection of cultural values

Children's literature has often been labelled of lesser importance in both quality and content than adult literature. Writers for children are often characterised as authors who could not make it as "serious" writers for adults. In part, this stems from attitudes towards the place of the child in our western society - children are seen as diminutive creatures who do not warrant, or could not fully appreciate serious high quality literature. But, in part, it is also a response towards the literature itself - a reaction to its simplicity of style and content.

Characterisation of Inuit

A *Peep at the Esquimaux* is one such simple book. Published in England in 1830, it takes the body of scientific and cultural knowledge brought back to England from early polar expedition and packages it for the very young child. It is quite possible that *A Peep at the Esquimaux* was inspired by the account of Captain W.E. Parry's second voyage in search of a North-West passage published in 1824. The author, who remained veiled behind the typical Victorian anonymity of "by a Lady" sets the moral tone of the book with this introduction "There were pictures in it, of Equimaux; those harmless natives of the Frozen Seas, about whom the children had heard so much from their parents, and whom they had been taught to consider with feelings of pity, as the most desolate of human beings." The book concludes with a "Polar Pastoral" which was written by a friend of the authoress "in consequence of having overheard a reproachful dialogue between a young Esquimaux Hunter, and a favourite Girl to whom he was betrothed. He upbraids her for having suffered her attentions to be diverted from him, in consequence of the rich presents made to her by the Europeans, belonging to the Discovery Ships and had so completely bewildered her brain, by their glittering charms, as to make her disdain her old and faithful lover." When confronted with her husband's anger the woman pleads, "thus torment me, pr'ythee leave the tent, My love has ceas'd, nor can I e'er relent; The dear Kabloonas gave me beads in store, with treasures which I never saw before". She goes on to list the gifts she has received from the Europeans but her lover, undaunted pleads with her to reconsider. She replies: "Stop! and love your Awa-runnie here; Forgive my taunts, from pride, I own, they rose. Here! seal forgiveness on my profer'd, Rub me a Koo-nik tender as your heart, and never from each other will we part"

Despite our incredulity that the Inuit lovers would converse in such Shakespearean tones, we are provided here with a fascinating firsthand account of early European contact with the Inuit. It tells of the effect that contact had on the social structure within a community, giving more intimate details of the early contact than could be found in an official expedition journal. This "*Peep at the Esquimaux*" contains information for the anthropologist, ethnologist and theologian. Linguists can look at the early use of such terms such as Esquimaux, Kabloonas and oomiak, and study the progression of "borrowed" words between cultures. And there is something else here as well. It is an example of the early 19th century moralising about the nature of indigenous people. It speaks not only about the moment of contact, and Western perceptions of it, but gives insight into the world of the author.

In his introduction to "*Imperialism and Juvenile Literature*", Jeffrey Richards states: "It is now recognised that juvenile literature acts as an excellent reflector of the dominant ideas of an age. The values and fantasies of adult authors are dressed up in fictional garb for youthful consumption, and the works thereby become instrumental in the dissemination and perpetuation of particular clusters of ideals, assumptions and ambitions." It is because these ideals, assumptions and ambitions are

presented clearly, sometimes almost vulgarly in juvenile literature, that they are so useful to the historian, anthropologist and ethnologist. Whereas in certain forms of adult discourse personal impressions about the world are suppressed in the interests of "objectivity", the agenda in the children's literature are much more blatant. It is much easier in juvenile literature to tease out these hidden messages and expose the cultural imperatives.

Imposition of adult values

Children's literature is often not considered culture in itself, but the imposition of the dominant culture on children. Victorian children's authors such as R.M.Ballantyne saw the minds of their young readers as a *tabula rasa* on to which could be imprinted their vision of the Empire. His early experience travelling across northern Canada, chauffeured, fed and clothed by native guides, found their way into his adventure novels with a decidedly imperialist point of view. The following passage, taken from Ballantyne's novel *Ungava* describes the encounter of his protagonist with a group of Inuit "Meanwhile, Stanley went down and stepped into the midst of one of the oomiaks, with a few beads and trinkets in his hands; and while Oolibuk entertained the men on shore, he presented gifts to the women, who received them with the most childish demonstrations of joy. There was something irresistibly comic in the childlike simplicity of these poor natives." In his novel *Fast In The Ice*, Ballantyne boldly exhorted his conviction that it was the duty of the Empire to save the poor heathen souls of the colonials. "It is sad, too, to think of this; for it is a low condition for human beings to live in. They seem to have no religion at all. Certainly none that is worthy of a name. I am much puzzled when I think of the difficulties in the way of introducing Christianity among these northern Eskimos. No missionary could exist in such a climate and in such circumstances."

Eric Quayle, in his biography of Ballantyne (Quayle 1967) says of Ballantyne's Imperial imagination: "It is true that he portrayed a world in which the good were terribly good, and the bad were terribly bad, and the British were terribly British - and worth ten of any foreigners alive, by Jingo!"

Even late into the 20th century juvenile novels used polar regions as mere backdrops on which to paint their tales of adventure. *Wings over the Arctic* (Grant 1947) is an excellent example of this. It is the story of two rival airlines who battle for the profitable trading contracts of the far North. The Inuit in this book - the vicious "Flesh-Eater tribe" - live in a village of "snow lodges" surrounded by sacred totem poles. The author makes no attempt at authenticity but simply throws together a hodgepodge of cultural details to create a fictional "tribe".

Juvenile literature is not just the encoding of a moral messages. It can reveal how scientific messages and debates can be reformulated for a popular audience. Not only does juvenile literature give a crystal clear account of common scientific theories free of all the specialized jargon of the scientific workplace, it uses popular culture to propangandize for a certain scientific belief. Historian of science James Secord (1985) advocates: "Children's books deserve an important place in the history of science. Carefully interpreted, they provide invaluable indicators of the changing social, religious, and moral values carried by scientific knowledge in different circumstances." The scientific debates surrounding the fate of the Franklin expedition are currently of much interest. A popular theory put forth by Canadian anthropologist Owen Beattie is that high levels of lead in the tinned food supply caused lead poisoning in members of the expedition. This theory is presented in his juvenile book *Buried in Ice* which details the exhumation of the graves of three sailors on Beechey Island in 1984 and an analysis of tin cans found at the site. Beattie's book presents just one theory in the ongoing debate about the fate of the Franklin expedition, but books of this kind are important indicators of changes in scientific knowledge.

Natural history

The study of natural history books for children provides an excellent indicator of the changing attitudes towards the natural world. Historian Harriet Ritvo, in her *"Learning from Animals: Natural History for Children in the Eighteenth and Nineteenth Centuries"* explores these perceptions: "By learning about animals children could also learn about mankind. The animal kingdom, with man in his divinely ordained position at its social order, in which the animals represented subordinate human groups." In a 1945 natural history book author G.M. Vevers professes "The Life Story of the King Penguin is the first of a new nature series which will give children the life stories of interesting species without turning animals into semi-humans". Contemporary books continue that tradition often weaving ecological issues into their text. The Eyewitness Guide *Whale* (Papastavrou 1993) concludes: "the future of whales and seals depends on people from all over the world getting together and co-operating . . . good intentions must be followed by real action and commitment. Only then can we safeguard the future of these magnificent animals". These ecological messages have found their way into picture books as well. Environmental issues relating to the Antarctic are advanced in *Antarctica* which address the human impact on the Antarctic ecosystem. "The penguins and the seals have always shared their world with ancient enemies, the Skuas and Leopard seals. But these new arrivals seem more dangerous. The seals and penguins cannot tell yet whether they will share or destroy their beautiful Antarctica."

Indigenous writers

A new literary voice now emerging is that of indigenous writers who are telling their own stories about their land and their culture. It is particularly to juvenile literature that we can look for this new voice with Inuit authors such as Alice French and Michael Kusugak.

The history of the North has too often been told by outsiders. Alice French presents the Inuit point of view in her autobiography *My Name is Masak* which describes her life growing up in the Arctic, and the painful experience of leaving her family and community to attend a residential school.

The picture books of Inuit author Michael Kusugak are based on his childhood in Rankin Inlet and Repulse Bay. *Baseball Bats for Christmas* is the true story of a Christmas in Repulse Bay in 1955, when a planeload of Christmas trees were delivered to the community. The children, never having seen "standing-ups" before did not see them as things to be adorned with decorations, but, stripping off all the branches, found they made wonderful baseball bats. In *A Promise is a Promise* Kusugak tells the legend of the Qallupilluq, an imaginary creature that lives in Hudson's Bay. It wears a woman's parka made of loon feathers and grabs children when they come too near cracks in the ice. A useful cautionary tale for communities that lived near the sea ice. Kusugak is more than a writer - he is a story-teller sharing the traditional knowledge and history passed down to him by his elders. The distinction between adult literature and juvenilia dissolves in the narrative form of folktales and legends. These tales are more than simple stories to entertain and amuse. They are intended to instruct, inform and pass on vital information to future generations.

Julie Cruikshank, Canadian anthropologist, noted during her recording of traditional Athapaskan stories "Not surprisingly these accounts all give central importance to landscape, physical environment, fauna, flora, and I would argue that we are dealing not simply with fanciful recreations of a physical world in mythical form, but with a system of knowledge encoded in particular symbols." When we decode the symbols in juvenile polar literature, and carefully interpret the moral and political agenda contained within, we begin to see a significant body of knowledge emerging. This neglected byway is of importance to the polar researcher and can help to educate a new generation of young people to issues which will affect the future of the polar regions.

This has been a very brief glance at a wide spectrum of juvenile polar literature. I hope the ideas presented will encourage librarians to take a fresh look at historical and contemporary literature for children, and to consider juvenilia a valuable element in building a polar collection.

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Wooden ships and iron men: some sources for their history

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Abstract: The author surveys a range of sources, both printed and manuscript from her experience as a librarian, archivist, curator and historian, 1954-1994, mainly in the United Kingdom, but including Canada, Australia and New Zealand. She first considers the kinds of literature about wooden ships and published "biographies" of particular vessels. She then touches on ships' logs and plans, personal diaries, official registers, the publications of learned societies and the reminiscences of individual seafarers. The approach is literary rather than logical and the survey is by no means comprehensive.

Key words: Ship history, logbooks, ships, seafarers, polar history, maritime history

Introduction

The following informal account, written as delivered, is intended to provide an introductory survey of published and archived sources relating to the history of polar ships and those who sailed in them.

Wooden ships

Many of your will know that I have taken my title from the book by Frederick William Wallace, entitled "Wooden ships and iron men" and subtitled, "The story of the square-rigged Merchant Marine of British North America, the ships, their builders and owners, and the men who sailed them." The first edition was in 1924 (reprinted 1973), and the second in 1937. In its pages can be found the histories of many a Bluenose ship, built in the Maritime Provinces of Canada during the Nineteenth Century, the Golden Age of Sail. Another such book, written like Wallace's from widespread and often scattered sources is of course Basil Lubbock's The Arctic Whalers, first published in Glasgow in 1937 and reprinted in 1955.

You may be familiar with this and with Lubbock's other works, for example, *The Blackwall Frigates, The China Clippers, The Down Easters, The Colonial Clippers, The log of the "Cutty Sark", The Opium Clippers* and *The Last of the Windjammers*, all published in Glasgow, by Brown, Son and Ferguson, well illustrated and bound in a characteristic shade of blue. Lubbock's papers are, incidentally, in the National Maritime Museum, Greenwich. The same firm published Charles Bateson's, *The convict ships*, which has a largely chronological framework, similar to that of Lubbock's books, Sometimes the vessels of a particular trading or passenger company have been described by authors and their histories given. For example David R. MacGregor's *The China Bird* (1961; second edition 1986), Commandant Jean Lanfant's *Historique de la flotte des Messageries Maritimes, 1851 - 1975* (1979), as well as Jean Sutton's *Lords of the East* (1981) which is about the Honourable East India Company and its ships. It is to be noted that the maritime history of another venerable chartered company, the Hudson's Bay Company, has still to be written. Sometimes books appear about a certain type or rig of vessel, for example Basil Greenhill's, *The Merchant Schooners* (1951; revised 1968.) Others describe the ships of a particular nation, like Howard I. Chapelle's splendid volume, *The History of the American Sailing Navy: the ships and their development*, (1949). More recently a reference work by A.L. Rice has appeared, entitled *British oceanographic vessels, 1800 - 1950.* (London, Ray Society, 1986). This contains about one hundred brief histories and a bibliography. Some of these oceanographic vessels, are of polar interest. Almost in a class of its own is Tor Borch Sannes' book about the famous Norwegian shipbuilder, Colin Archer, entitled *Colin Archer skipene.* (Oslo, Bokhandlerforlaget, 1978.) There can be found not only information about Nansen's *Fram*, but about the *Zarya*, the *Jason* (later *Stella Polare*) and *Southern Cross.*

My former colleague at Greenwich, Christopher Ware is just completing a monograph on 18th and 19th century bomb vessels for the Conway Maritime Press (London) for publication in their series, *The anatomy of the ship*. These particularly sturdy wooden vessels were built to stand the recoil of heavy mortars and usually had names with a smell of brimstone about them, such as *Aetna* and *Beelzebub*. Often further strengthened for use in ice, they carried a number of British naval expeditions from Phipps to Franklin. Ware's publication will doubtless enlarge upon an article by another colleague, A.W.H Pearsall entitled 'Bomb vessels' in *Polar Record*, Vol. 16, 1973, p. 781-88. Mr Pearsall formerly Custodian of Manuscripts and later Historian of the National Maritime Museum also contributed a paper entitled, 'Ships in the Arctic, 1600 - 1850' to a conference held in Paris, under the auspices of the Centre d'Etudes Arctiques, November 1983. The

proceedings were published by the Centre National de la Recherche Scientifique (Paris) in 1987 under the title *Pôle nord 1983* (1983), directed by Jean Malaurie and edited by Sylvie Devers. *'Ships in the Arctic'* appears on p. 169 - 78. Many of the other articles in this work published in French or English are of interest.

Biographies of individual ships

I wonder how many sailing ships have their own individual published biographies. The ones I can think of are less than a dozen - and I shall be interested to know what others there may be. My first is the barquentine *Bear*, best known as Admiral Byrd's *Bear of Oakland*, built in Dundee, Scotland, as a Newfoundland sealer in 1874. She is also well known for her part in the rescue of Greely and as a U.S. Revenue Cutter in the North Pacific. The *Bear*'s life story was written with great affection and respect by Frank Wead and published in New York in 1937. The book's title is *Gales, ice and men: a biography of the steam barkentine Bear.* Another biography of the *Bear* is *Track of the Bear* by William Bixby (New York 1965). The second ship is Nansen's famous *Fram*, that most historic of polar ships, preserved with Amundsen's little *Gjøa* in the Norsk Sjøfarts Museum, Oslo. Commanded later by Sverdrup and Amundsen, the first "biography" of the *Fram* was written by Odd Arnesen and entitled *"Fram", hele Norges skute* (Oslo, Jacob Dybwads Forlag, 1942. 297 pages.) The second and quite recent one is a particularly well illustrated account by Tor Borch Sannes: *Fram* (Oslo, Norsk Maritimt Forlag, 1989. 292 pages.) Both these books are written in Norwegian.

The third is the ship of the Swedish Antarctic Expedition of 1901-04, led by Otto Nordenskjöld. She was the auxiliary barque *Antarctic*, sent earlier to the Antarctic by Svend Foyn from Tønsberg on the Oslofjord, to investigate whaling possibilities in the Antarctic, during an expedition led by H.J. Bull of 1893-95. In between her two visits to the Antarctic, she carried three Swedish and one Danish scientific expeditions to East Greenland or to Svalbard. Beset and crushed in the ice of Erebus and Terror Gulf at the entrance to the Weddell Sea, the *Antarctic*, like Shackleton's *Endurance* left her timbers at the bottom of that perilous sea. Her biography is called *Antarctic* and was written in Swedish and published in Stockholm, by Saxon and Lindström, in 1944. It is by J.G. Andersson, the well known geologist, who had sailed in the ship to both polar regions.

My fourth is Sir Ernest Shackleton's *Endurance*, whose name was given to two narratives of his Imperial Trans-Antarctic Expedition, 1914-17. For in many ways, the history and the agonies of that last voyage of the so-called "Heroic Era" of Antarctic exploration were those of the *Endurance*, which had only been built in 1912. So that her brief life story is more or less that of the first year of Shackleton's Weddell Sea Party, of whom six men had been intended to cross the continent with dog teams. I think of Worsley's *Endurance* (published in 1931) and of a later study by an American writer, Alfred Lansing, published in 1959. Worsley of course wrote from first hand as Master of the auxiliary barquentine, which had been built in Sandefjord, Norway, for navigation in loose pack ice. One of Worsley's most telling paragraphs relates how Shackleton broke the news that the *Endurance* was doomed, surrounded as she was, amid thousands of miles of grinding ice-floes.

> "The ship can't live in this, Skipper," Shackleton said at length, pausing in his restless march up and down the tiny cabin. "You had better make up your mind that it is only a matter of time. It may be a few months, and it may be only a question of weeks, or even days. Wild and I know how you feel about the *Endurance*, but what the ice gets," and I recognised the ring of prophecy in his tone, "the ice keeps".

When Alfred Lansing was preparing his book, a number of those who had sailed in the *Endurance* were still alive and several diaries in private hands were also made available to him.

A fifth well written biography is that of a survey ship, a later H.M.S. *Challenger*, by one of her captains, George Stephen Ritchie, published in 1957. It is the complete story of what he calls a happy ship, working in many parts of the globe, including Labrador and Iceland, from the 1930's until 1953, by which time she had nearly rusted through. Although she was not a windjammer, I include this *Challenger* here because, like the sailing ships on exploring expeditions, she was often remote from any trade route "on the wide oceans of the world." (p. 238) Let me show you, with two quotations, what I mean. It has often been said that worst part of an expedition is the preparation before going to sea. Admiral Ritchie writes (p. 238)

> The peace which comes upon the commander of a deep-sea expedition as the land slowly sinks below the horizon astern and he heads for the limitless ocean is profound. The ship is clear of all but those who are there for a purpose, no telephone is connected, no unwanted midday caller will arrive; all that matters is the one job in hand, that of surveying and studying the ocean.

and again, regarding the sights to be seen during the voyage (p. 239)

> The moon rising above the horizon like a ship on fire; the stars so bright on a calm tropic night that silver threads run beneath them over the dark sea; the green flash from the setting sun; the windrows, and the calm unaccountable swathes upon the surface of the sea when a gentle breeze begins after calm; the great fleets of Velellas, pale white and blue, their sails set, and all sailing purposefully before the Trades; the dolphins racing before the ship's stem one above the other, turning upon their backs to show their white bellies in pure ecstasy of enjoyment; the steady, relentless progress of a giant swell generated by a distant storm, passing across the

surface of the sea; golden rafts of algae... these are the things one has time to regard and time to ponder on when passing unhustled across the face of the ocean.

Having drawn attention to Admiral Ritchie's "biography" of the survey ship *Challenger*, I must do the same for another British vessel navigating in uncharted seas later this century - the successor to Captain Scott's *Discovery*, the steel-built Royal Research Ship *Discovery II*. She carried the scientists of Discovery Investigations on six oceanographic and survey voyages to the Southern Ocean, between 1929 and 1951. Her story and that of the R.R.S. *William Scoresby* has been told in John Coleman - Cooke's *Discovery II in the Antarctic*. (London, Odhams, 1963.) An appendix provides useful short biographies of the scientific and naval staff, most of whom were recipients of the Polar Medal. Another ship history is *Arctic assignment : the story of the St Roch*, by Sergeant Farrar of the Royal Canadian Mounted Police, who spent ten years aboard the 80 ton schooner, including the traverse of the North West Passage during World War II. The book was published in Toronto, by Macmillan in 1967. The *St. Roch* is now preserved under cover as a museum ship in Vancouver.

Since none of them was engaged in exploration, I shall merely mention the three splendid ships preserved at Portsmouth: the Tudor warship *Mary Rose*, Nelson's *Victory* (still a flag ship) and the Victorian warship H.M.S. *Warrior*; likewise, the famous clipper ship, *Cutty Sark*, preserved at Greenwich. All these have generated publications. I shall also pass by the numerous accounts of particular voyages, often written by a mariner, a scientist, a surgeon or a passenger aboard, for instance David Moore Lindsay's, *A voyage to the Arctic in the whaler 'Aurora'* (London, 1911) or by a maritime historian, like Sheila Natusch's *The cruise of the 'Acheron'* (Christchurch, N.Z. 1978.) Either individually or when more than one voyage narrative exists for a single vessel, these are obvious sources for a ship history. Many of the more historic or interesting voyages have been published and edited by the Hakluyt Society or the Navy Records Society, both of which are long-standing learned societies - the Hakluyt is nearly 150 years old and the NRS has recently celebrated its centenary. I should also mention here the former Hudson's Bay Company Record Society, which published so many fine volumes, as well as the Champlain Society, the Linschoten Society, the Van Riebeeck Society, the Roebuck Society and similar bodies. Incidentally the founder of the Roebuck Society, Dr J S Cumpston, was involved in the compilation of the first Australian map of Antarctica and its gazetteer. The Hakluyt Society has recently published in the Extra Series, *The charts and coastal views from Captain Cook's second great voyage of 1772-75 in the Resolution and Adventure*, Chief Editor, Andrew David. *The voyage of Christopher Middleton, 1741-1742* appeared this year (1994) in the Ordinary Series, edited by William Barr and Glyndwr Williams. A sequel is to follow under the overall title *Voyages in Search of a Northwest Passage 1741-1747*.

The sailing ship which I know best is the auxiliary barque *Discovery*, built at the turn of the century, and famous as the ship of Captain R F Scott's first Antarctic expedition, 1901-04. She is now berthed in Dundee with a Visitor Centre alongside, where her story is told. The *Discovery* has had two biographies. The first was by the physicist of the National Antarctic Expedition, L.C. Bernacchi, whose *Saga of the 'Discovery'* was published in 1938. He had the advantage of having been a member of two Antarctic expeditions including Scott's first, of being a contemporary of Sir Douglas Mawson and also of being acquainted with other "Discoveries", as his shipmates and other later scientists and sailors of the *Discovery* were called.

However, when I was commissioned in 1979 to write a new biography of the *Discovery*, I was able to take a longer perspective and I also knew where the likely sources would be, some of them in institutions, like the Scott Polar Research Institute and the National Maritime Museum which were only just established when Bernacchi was writing. Although there were of course no survivors from the National Antarctic Expedition of 1901-04 to talk to, I was most fortunate in finding one from the *Discovery*'s 1911 voyage. Likewise four from the *Discovery* (Oceanographic) Expedition of 1925-27 to the South Atlantic and Southern Ocean and one from Sir Douglas Mawson's B.A.N.Z.A.R.E. voyages of 1929-31.

The children or grandchildren of those sailing on other voyages between 1901 and 1931 as well as Sea Scouts from the *Discovery*'s years on the Victoria Embankment in London were often eager to help by making letters, photographs, sketches and diaries available, sometimes welcoming me to their homes. Chance or good luck plays a part in any historical research : so it was in making contact with these seafarers or their families. The daughter of a scientist on the oceanographic expedition turned up at the National Maritime Museum in Greenwich one day to offer for the collections her late father's oilskin trousers, worn on the ship's outboard platform when a scientific station was in progress. She later let me study his diaries and letters. Likewise two survivors had asked the museum for advice in writing their memoirs.

I little thought when starting to research that I would actually meet someone who had been an Able Seaman aboard the *Discovery* before the First World War. He was Captain A. R. Williamson, whose memory of the 1911 voyage was A1. His reminiscences and the article he wrote for *The Beaver* gave me a first-hand account of the trans-Atlantic passage from the Thames to Hudson Strait and thence to James Bay, and York Factory, through the shallow, shoaling, and uncharted icy waters of Hudson Bay, when the *Discovery* was the annual supply ship of the old chartered company between 1905 and 1911.

Ship's logs

The ship's log may be called the backbone of any voyage and these I found in various repositories: the Royal Geographical Society, South Kensington (for the Scott voyage); the Hudson's Bay Company Archives in Winnipeg for the years 1905 to 1920 except for the Shackleton relief voyage of 1916, which is in the Public Record Office, Kew; the National Maritime Museum for the oceanographic voyage of 1925-27 and the Mawson Collection, University of Adelaide for B.A.N.Z.A.R.E. Some logs are more informative of course than others and those of merchant ships *much, much* rarer than naval ones. In the Admiralty records at the Public Record Office, Kew, is a long series of Captains' and Masters' logs of naval vessels. These stretch from the latter part of the 17th Century to the early 19th. There are also ships' logs from 1799. The National Maritime Museum holds likewise a long series of Lieutenants' logs (over 5000 volumes) from 1673 to 1809, transferred from the Admiralty in 1938. The entries in all these logs and in those which survive from merchant ships give position, courses, weather, times of setting and handing of sail and other proceedings of the twenty four hours. In the later 19th Century, naval midshipmen were required to keep logs as part of their training. These are more individual in style and content, and were illustrated by sketches, views and little charts. They were not retained by the Admiralty when the ship was paid off and can often be found in personal collections. For example, that of (Sir) Clements Markham, kept during the Franklin Search voyage of 1850-51 in H.M.S. *Assistance* (Captain Ommanney) is in the archives of the Royal Geographical Society, South Kensington.

A distinction has to be drawn between all the logs mentioned above and what are termed, the Official Logs of merchant ships (19th and 20th Centuries), which with the Crew Lists form the ships' papers. These Official Logs record births, deaths, acts of insubordination etc. The Crew Lists comprise the names and addresses, joining and discharge dates of a merchant ship's company as well as an individual's previous ship. An aircraft hangar at Hayes, Middlesex housed these bulky records of the Registrar General of Shipping and Seamen until the 1960's, when it was proposed to destroy them. After much debate and discussion, a solution was found for their preservation. The Public Record Office took those from 1834 to the early 1860's, then a 10% sample as well as the crew lists and official logs of historic ships. The National Maritime Museum took another 10% sample, made in a different way. In addition any coastal County record office could claim the records relating to its ports. The remaining documents were shipped to the Memorial University of Newfoundland where there is now an index on computer. Thus for the crew lists and official logs of for example, the *Nimrod, Morning, Discovery* and *Terra Nova*, one probably needs to visit the Public Record Office, where a Records Information Sheet is available. (See also N.G. Cox. The records of the Registrar General of Shipping and Seamen, *Maritime History* Vol. 2, 1972, p. 168 - 88 and Keith Matthews. Crew lists, Agreements and Official Logs of the British Empire 1863 - 1913, now in the possession of the Maritime History Group, Memorial University, St John's, Newfoundland. *Business History*, Vol. XVI , 1974, p. 78-80). It is necessary to know a merchant ship's official number to use these records. It is to be found in the Mercantile Navy List. This number remained the same for the "life" of a vessel, and in wooden ships was carved prominently on the main beam.

Ship's plans

Ships plans sometimes survive in personal collections, but those of most British naval vessels can be found in the Admiralty Draughts Collection, deposited in the National Maritime Museum. The collection includes a number of merchantmen, used as transports, and some foreign prizes, taken in battle. The plans (draughts) of the following polar sailing ships are there: *Furnace* (1740), *Endeavour* (Captain Cook), *Racehorse* and *Carcass* (Phipps), *Isabella* (1818), *Erebus* and *Terror* (Ross and Franklin), *Investigator* (1847), *Enterprise* (1848), *Resolute* (1850), *Challenger* (full set, 1870's), *Alert* (1875) and *Discovery* (formerly the Dundee whaler Bloodhound, 1875.) The plans of the *Thomas Roys*, whaler, built in Glasgow in the 1860's by Alexander Stephen have survived in that yard's collection (reference A.S. No. 93.) Plans of Scott's *Discovery* and *Terra Nova*, as well as Shackleton's *Quest* are also at Greenwich. In addition, the drawings for the sledges and other equipment of the Nares Arctic expedition, 1875-76 are there.

Other sources

In 1971 was published a guide to the papers of leading firms in the British shipping industry. It was compiled by the Business Archives Council, in conjunction with the National Maritime Museum and edited under the title, *Shipping : a survey of historical records* by Peter Mathias and A.W.H. Pearsall. The book is still of value, despite being to some extent out of date. The firm of Christian Salvesen & Co. (with their associated whaling companies) has an entry in the book. From these records was written Wray Vamplew's *Salvesen of Leith* (Edinburgh, Scottish Academic Press, 1975.) The firm itself published a history of its fleet by Graeme Somner, entitled *From 70 North to 70 South* (Edinburgh, 1984). This comprises an annotated and illustrated list of ships. A number of logs and related documents are listed by Mathias and Pearsall among the holdings of County, university and other record offices. The papers of several British shipping and shipbuilding companies are now in the public domain at Greenwich, Glasgow, Newcastle and Liverpool. Another survey was published in 1993 by the Maritime Information Association, formerly a group of maritime libraries. Entitled *Maritime*

information : a guide to sources of information in the United Kingdom, it is by Rita V. and Terence N. Bryon. Published by Witheby and Co. for the Association, it can be ordered from Withebys at Aylesbury Street, London ECIR OET. (222 pages.)

Now that Clive Holland's *magnum opus, Arctic exploration and development c. 500 B.C. to 1915* has been published, it is possible to trace the voyages in polar waters of any particular vessel by referring to Holland in conjunction with R.K. Headland's also monumental *Chronological list of Antarctic expeditions and related historical events* (Cambridge University Press, 1989.) These two volumes, as well as the earlier Cooke and Holland (Alan Cooke and Clive Holland, *The exploration of northern Canada*. Toronto, Arctic History Press, 1978.) are of great value for their references to the literature and to people as well as to ships. Other useful works are *Manuscripts in the Scott Polar Research Institute, Cambridge, England : a catalogue*. Edited by Clive Holland (New York, Garland, 1982) and *Guide to the manuscripts in the National Maritime Museum*. Edited by R. J. B. Knight. 2 vols. (London, Mansell, 1977 and 1980).

A recent extensive compilation is *Manuscripts and government records in the United Kingdom and Ireland relating to Canada*. Edited by Bruce G. Wilson. (Ottawa, National Archives of Canada, 1992.) This is in the tradition of the substantial and scholarly work edited by Miss Phyllis Mander-Jones, entitled *Manuscripts in the British Isles relating to Australia, New Zealand and the Pacific* (Honolulu, University of Hawaii Press, 1972). The geographical coverage of Mander-Jones extends to Antarctica and to the peri-Antarctic Islands of the southern Pacific and Indian Oceans. Both these works list material in the British Library (formerly part of the British Museum) the Natural History Museum (British Museum, Natural History), the Public Record Office, County record offices and other repositories and collections, public and private. I myself made a survey of manuscripts of polar and whaling interest in Australia and New Zealand in 1961-62. Photocopies of this were made and bound for a number of libraries. The original is in S.P.R.I. This may well have been superseded by Ian Nicholson's, *The log of logs*. 2 vols. (Canberra, Roebuck Society, 1990 and 1993), which lists logs, shipboard diaries, letters, voyage narratives etc. from 1788 onwards for Australia, New Zealand and surrounding oceans. I have not yet had the opportunity to examine this work of reference, and do not know whethr the Southern Ocean is included.

Another survey of very great interest was done by Dr Selma Huxley Barkham in the archives of northern Spain between 1972 and 1984 under the auspices of the then Public Archives of Canada. She located little known documents relating to Basque cod and whale fisheries on the coasts of Newfoundland and Labrador between 1517 and 1713. Her *magnum opus* is the splendid book *Itasoa 3. Los vascos en el marco Atlántico Norte* (San Sebastian, Editorial Etor, 1987.) There is a chapter on Basque shipbuilding by Dr Michael Barkham and there are reproductions of a number of documents illustrating the promoters and the mariners of these voyages. The booklet published by Parks Canada entitled, *Basque whaling in Labrador in the 16th Century*, by Jean-Pierre Proulx (Ottawa, 1993) is largely based (with scant acknowledgement) on the Barkhams' original research in Spain.

The voyages of the Elizabethan sea dogs, such as Drake and Hawkins, were popular subjects in Victorian times. They appear to have been somewhat neglected in our own, the 400th anniversary of Drake's circumnavigation providing the exception. However, Sir Martin Frobisher's search for the North West Passage in 1576 and his subsequent mining ventures of 1577 and 1578 (all in Frobisher Strait, Baffin Island) have excited much interest in Canada and the United States in recent years, following the pioneering studies of the late Dr Walter Kenyon of the Royal Ontario Museum, Toronto in the 1970s. Three books have been published as a result of field work in the Canadian Arctic and of archival and other research in England, Canada and Ireland. These are, firstly, The Meta Incognita Project . . . edited by Stephen Alsford (Hull, Quebec, Canadian Museum of Civilization, 1993); secondly, Archaeology of the Frobisher Voyages. Edited by William Fitzhugh and Jacqueline S. Olin (Washington, D.C., Smithsonian Institution, 1993) and lastly, Martin Frobisher's Northwest venture, 1576-1581: mines, minerals and metallurgy. By D. D. Hogarth, P. W. Boreham and J. G. Mitchell. (Hull, Quebec, Canadian Museum of Civilization, 1994). I have often sat in the train at Dartford, on the lower Thames, while journeying between Canterbury and Greenwich. Little did I realise, until joining the Archival Task force (U.K.) of the Meta Incognita Project, a couple of years ago, that the ancient wall at Dartford is in part built of the worthless black ore brought back for smelting there by Frobisher - some 1200 tons of it, carried in the small wooden sailing ships of the time. One of the authors of the above publications, P. W. Boreham, is Curator of the Dartford Museum.

Iron men

So far I have spoken mainly about wooden ships, but I have not forgotten the iron men, many of whose diaries and letters are listed in the works cited so far. The autobiographies, voyage narratives and biographies of well known seafarers and explorers will be familiar to polar librarians. However, I must commend to you the articles by Mr A.G.E. Jones, who has published in various journals, the brief biographies of the less well known. Some of these have been republished in a *variorum* edition by Caedmon of Whitby with the title, *Polar portraits : collected papers [of] A.G.E. Jones* (1992).

In one of these articles, "Tracing a master mariner" (p. 55-60), reprinted from *The Local Historian* (1969), the author shows how he painstakingly brought to light the earlier life of John Biscoe, who commanded the Enderby vessels *Tula* and *Lively* in 1830-33, discovering Enderby Land, Adelaide Island and the Biscoe Islands in the Antarctic. This article may be used as a guide to sources for such seamen. Further guidance can be found in the booklet written by Dr. N.A.M. Rodger (for many years an Assistant Keeper at the Public Record Office), entitled *Naval records for genealogists*. (London, Public Record Office, 1984 and HMSO, 1988). A similar aid for the Merchant Navy, called, *My ancestor was a merchant seaman*, written by C.T. and M.J. Watts was published by the Society of Genealogists in 1987. Sir Clements Markham's *Arctic Navy List* (London, Griffin, 1875) is still of use as an annotated list of officers and ships of the Royal Navy engaged in polar exploration, 1773-1875. It was reprinted in their *Vintage & Naval Library* by the London Stamp Exchange in 1992

I have hardly mentioned those particularly iron men, the whalers of the Northern and Southern whale fisheries of the 18th and 19th Centuries in their wooden ships. The American whaleman has generated a very considerable literature and there are hundreds of his logs and other documents in various museums and collections in the U.S.A. Many of these were listed and analysed by Stuart C. Sherman, whose *The voice of the whaleman* (Providence Public Library, 1965) is beautifully designed and produced. Robert Langdon edited *American whalers and traders in the Pacific : a guide to records on microfilm* (Canberra, Australian National University, 1978) for the Pacific Manuscripts Bureau. In 1986 appeared *Whaling logbooks and journals 1613-1927* which lists over 5000 ms. logs and journals in the public domain throughout the world. Originally compiled by Stuart C. Sherman, it was revised and edited for publication by Judith M. Downey and Virginia M. Adams, with the help of Howard Pasternack. (New York, Garland, 1986). A list of British whaling logs was produced by Sidney G Brown and Ann Savours for the conference on whaling records held at the Kendall Whaling Museum in 1977. The proceedings were edited by Michael F. Tilman and Gregory P. Donovan, under the title, *Historical whaling records,* as Special Issue 5 of the *Reports of the International Whaling Commission* (Cambridge, 1983.) We still hope to complete and publish our list one day. Many of you will know the work of John Bockstoce and of W. Gillies. Ross on whaling in the North American Arctic (mainly 19th Century).

For many years, Dr Cornelis de Jong of Pretoria has been studying the sources for old Dutch whaling in the Netherlands and elsewhere. Although in many ways an economic history, the three volumes of his *Geschiedenis van de oude Nederlandse walvis vaart* (Pretoria and Johannesburg, Universiteit van Suid - Afrika, 1972, 1978 and 1979) contain illustrations of wooden ships and of course gleanings about their Captains and crews. There is an English summary at the end of the second volume and an extensive bibliography. In connection with whalers and their ships, one cannot fail to mention Dr. William Scoresby, whose great classic *An account of the Arctic regions, with a history and description of the Northern Whale Fishery*. (2 vols, Edinburgh, 1820) was reprinted by David and Charles in 1969, with a new introduction by Sir Alister Hardy. One must also draw attention to the other reprints of Scoresby's works by Caedmon of Whitby - and to translations, reprints and other books relating to Antarctic expeditions, published by Bluntisham Books over the last two decades. Some of my "iron men" were scientists or naval officers who carried out scientific work. Two books have been published recently by Cambridge University Press, covering their life and work in the polar regions. G.E. Fogg's *A history of Antarctic Science* appeared in 1992 and Trevor Levere's *Science and the Canadian Arctic.... 1818-1918* the following year. Levere's is set largely in the age of sail, while Fogg's stretches almost to the present day.

Concluding remarks

Charts, paintings, photographs and maps are obvious additional sources for those endeavouring to follow in the wake of exploring ships or in the tracks of men ashore. I cannot hope even to touch on these. However two recently published volumes help to bridge the gap. The first is *"The Times" Atlas of World exploration*, edited by Felipe Fernández-Armesto (London, Times Books, 1991), which includes the polar regions. The second, more specific work was published in Finnish, French and English editions by Helsinki University Library and the John Nurminen Foundation in 1992. The title of the English edition is *The Northeast Passage from the Vikings to Nordenskiöld*, edited by Nils-Erik Raurala, translated by Philip Binham and Marianne Saari. Further back in time, some of the old superseded Admiralty charts of the Arctic and Antarctic showed the tracks of exploring ships and one (5101) even plotted the finds of Franklin relics on and near King William Island. One of the American Antarctic Map Folio Series bears ships tracks, as does the Russian atlas of the Antarctic (Moscow and Leningrad, 1966). Treasure trove in the form of portraits of British polar mariners and their ships can be found in the *Concise catalogue of oil paintings in the National Maritime Museum* (Woodbridge, Suffolk Antique Collectors' Club, 1988. 593 pages).

Much more could be written on my theme, but this short sketch most suffice for the present. I shall end by commending to you as librarians, archivists and historians, Martin Gilbert's *In search of Churchill: a historian's journey* (London Harper Collins, 1994). This admirable volume provides a personal and almost step by step account of the discoveries the author made (and

how he made them) while working on the published Churchill biography (eight volumes) and documents (ten volumes). It is a sort of historian's *Pilgrim's Progress* and may seem far distant from wooden ships and iron men. But when one thinks, it and they can be connected.

Acknowledgements

Thanks are due to Mr A.W.H. Pearsall and to Mr Robin Craig for advice on merchant shipping records, to Mrs Letitia Simmonds for a reference and to Mrs Karen MacLellan for her cheerful typing and amendment of the various drafts. I also acknowledge the help of Ms. Susan Barr of the Norsk Polarinstitutt and of Ms. Else Marie Thorstvedt of the Norsk Sjøfartsmuseum regarding the *Fram*. Mr A.W.H. Pearsall and Mr H.G.R. King kindly commented on the draft, but any sins of omission or commission remain the writer's.

The human element: Kathleen Shackleton and the Hudson's Bay Company

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Abstract: Kathleen Shackleton (1884-1961), a sister of Sir Ernest Shackleton, was a successful portrait artist who worked in both England and Canada. In 1937-1938, on a commission for the Hudson's Bay Company, she produced 55 pastel portraits of 'men and women of the North' which are now part of the Hudson's Bay Company Archives. Kathleen Shackleton's comments on the Hudson's Bay Company and on the Anglican Church (particularly its mission at Aklavik) offer an interesting 'outsider's' viewpoint on those two great institutions of northern Canada.

Key words: art history, portraiture, Canada

Introduction

Born in Dublin in 1884 and raised in England, Kathleen Shackleton longed from childhood to be a portrait artist and to go to Canada. She achieved both these youthful dreams and today her portrait sketches of Canadians - railway workers, lumbermen, *habitants*, fur traders, and men and women of the First Nations - are to be found in collections across the country.

Kathleen first came to Canada before the First World War and worked for some years as a journalist on the *Montreal Star*. During the war she returned to England and, for her services as Chief Women's Establishment Officer at the Board of Trade, was made a Member of the Order of the British Empire. She then spent a year in Czechoslovakia, working on propaganda for the government of that new nation. During the 1920s and 1930s she spent as much time as she could in Canada. This was not always easy, given Canada's financial situation, and then she would be based in London, sketching celebrities. She claimed to have sketched more celebrities than any living artist yet her heart was not always in the work. She found it difficult, she said, to draw people whose lives she didn't like. Kathleen made it back to Canada in the fall of 1937, having secured a commission from the Hudson's Bay Company, and there she remained until after the Second World War. In her later years she was still busy as a portrait artist, sketching, for example, workers in the fur warehouse of the Hudson's Bay Company and the staff of the Docks and Inland Waterways Executive. She died in 1961.

Kathleen credited her adored elder brother, Ernest, with giving her the courage to embark on the risky life of a free-lance artist and journalist. Yet her own strong character was in its own way as remarkable as her brother's. It was rooted in a deep Christian faith. Kathleen once wrote that she had "considered the question of being a 'Missionary in the North' myself when young .... (It was after hearing Archdeacon Lloyd speak in Tunbridge Wells that I considered it.) I, in common with many would-be missionary girls, was having a reaction from a love-affair, but I faced my own symptoms clearly and did not give a lot of strangers the benefit of my reaction." Yet although she did not become one of those "charming girls" as she called them, "who having had a 'Call' instantly rush off to 'do good' to dark coloured persons, instead of turning around and being just 'good' among their own friends and relations", her Christianity remained vital to her. Brought up as an Anglican, she was to return to the traditional faith of her Shackleton ancestors and become one of the Society of Friends, commonly known as Quakers. The Quakers strive for simplicity and sincerity; these were the hallmarks of Kathleen's character.

The Hudson's Bay Company commission

In June 1937 Kathleen, unable to feel settled in London because, as she put it, she missed "the earth of Canada", approached Sir Edward Peacock, a Canadian-born director of the Hudson's Bay Company. Sir Edward had previously purchased almost 100 of her Indian portraits and presented them to Queen's University at Kingston. She told him, "I want very much to be commissioned by the Hudson's Bay Company to go back to Canada, as far North as possible and make a series of coloured drawings of ....[the] old-time trappers and other workers of the Company, Indian types, etc. etc." These drawings could become, she suggested, "a record of the 'Human element' in the history of the Company."

Kathleen's timing could not have been better. The Company had under consideration "a plan of obtaining photographic records of types of people and places associated with the Company and which are passing out

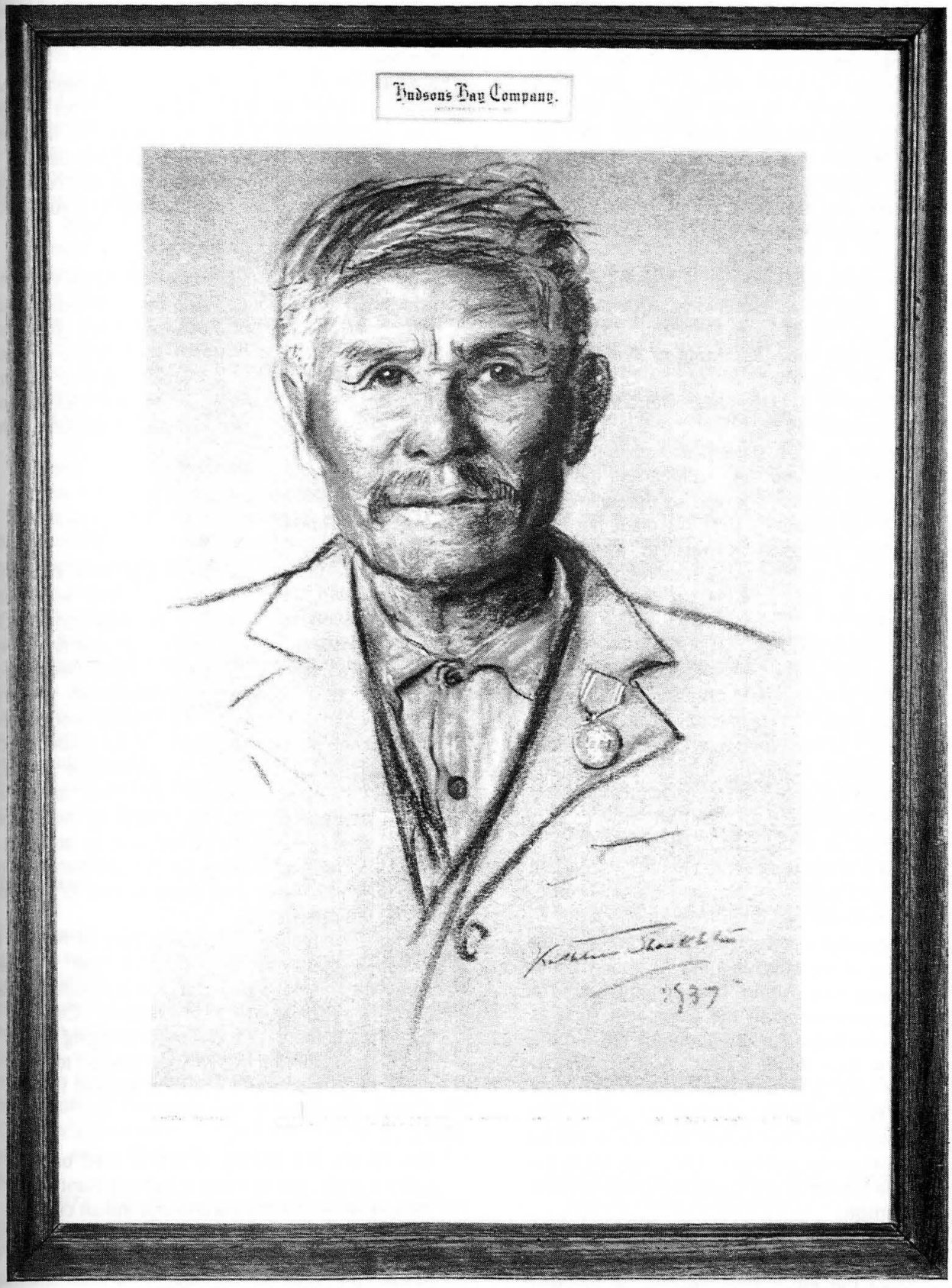

Fig. 1. Kathleen Shackleton portrait of Johnny Berens, the Mackenzie River pilot, 1937. (HBCA, PAM - P-253)

of existence", as well as "more artistic records of the same type." As Kathleen was a well-known artist who "specialized in the vanishing types of Indians, Habitants, etc.", she was clearly the woman for the job.

In July 1937 Kathleen had an interview with the Company Secretary, J.C. Brooks. He described her as "of artistic temperament with considerable ability, but with little 'business' acumen, and not in very good circumstances financially." Kathleen had suggested that in return for 36 pastel sketches, each 21" by 15", for which her usual price was $125 each, the Company should pay her $3000 and expenses. The Company offered her $2000 and expenses, which she accepted. (In the end she was to receive $2250 for 55 portraits or about $40 each.)

Kathleen arrived in Winnipeg on 1 September 1937 and from there went on to Waterways, Alberta where she travelled down river as far as Fort Smith. Her next stop was British Columbia. Returning to Winnipeg in late October, she travelled to Moose Factory in November and Quebec in December. Her commission ended on 31 December 1937.

Because freeze-up had started it had not been possible for the Company to send Kathleen all the way 'down north' to the Arctic. She was so determined to "secure Eskimo" that in January 1938 she made her own arrangements with Canadian Airways to fly her to Aklavik where she completed more sketches (and gave drawing lessons to the children in the Anglican residential school).

By and large, Kathleen has a wonderful time during the few months she worked for the Company. She loved the frontier spirit of the North and the sense of being "right away from city life and trains and buses that go on *clock*-time." She even enjoyed such experiences as what she described as having "a nice sleep among some coal sacks on the wharf" at Fort McMurray and the forced landing of the plane from which she was rescued by "a handsome Indian & dog-team". The one drawback to being rescued was that it prevented her from spending the night in a tent with the pilot and the mechanic, something to which she had been looking forward.

Kathleen responded intently to the allure of the North and the romance of the Hudson's Bay Company. She was full of ideas that would have enabled her to maintain her connection with the Company, such as writing a book with Ralph Parsons about his life and the Company's early days in the Eastern Arctic. Yet her honest Quaker soul and her keen artist's eye (one reporter wrote that "she sees right through you, to the earth behind you") made her realize that life in the fur trade was not without its problems. For some, life in the North and in the service of the Company could become an emotional prison.

Kathleen put down her thoughts on this matter in a set of "Notes on H.B.C. Posts." She felt that fur trade employees spent too much time cooped up together with little to do and nothing to talk about. She noticed "the strange silence that hangs about some of the younger men" and "the queer staring cat-like eyes one meets in the North." Relationships with women could be equally wretched. Too often these consisted of casual affairs. Marriage was not necessarily any happier. Kathleen commented on Mr and Mrs Bob McDermott at Fort McKay:

> First experience of a breed marriage, seemed that there was little fifty-fifty companionship for old age, Mrs M remarked 'I just look after his food and clothes and leave him alone.' Bob seemed like a restless caged tiger always walking up and down and watching the river for possible craft as a subject for conversation.

She concluded her 'Notes':

> Most of all, the old tradition of the 'Lone Wolf', the brave man living alone should be abolished. It is not a true ideal of life but a false one, and [militates] against the value of woman in a man's life, and where a man can live a woman can live too, and 'The Bay' would be more successful if it let go some of its old 'romantic' traditions and faced some of the true facts of life.

The Anglican Church

Her thoughts on the fur trade Kathleen shared in confidence with the Company. She was more forthcoming with her views on the Anglican Church. While in Aklavik in January 1938, Kathleen had stayed at the Anglican residential school. With memories of her own youthful wish to be a missionary, she was touched by the sincerity of the church workers and appalled by the physical condition of the school, which she considered to be an uncomfortable fire-trap. Anxious to help, she raised some funds to buy an electric lighting plant for the school by holding an exhibit of her drawings in Aklavik and by arranging a display in Winnipeg of some of the children's artistic efforts. She also made her views known to the press when she returned south.

Under the headline "English Culture of No Use to Nanooks of the North", readers of *The Winnipeg Tribune* were treated to such statements of Kathleen's as:

> English customs aren't necessarily Christian customs and there is no reason for bringing Indian and Eskimo children into mission schools to teach them things that could never be applied in their lives as fishermen or trappers.

She went on:

> The church [All Saints], which is used once or twice a week, has an electric lighting plant, while the school, where the Eskimo and Indian children are living and which is in use daily, is lighted with oil lamps. The teachers are in constant fear of fire. It's perfectly ridiculous.

Archibald Fleming, the Bishop of the Arctic, was furious.

As he was under the mistaken impression that Kathleen was still in the Company's employ, the Company received a share of the episcopal indignation. Fleming vented some of his wrath in a long letter to the Fur Trade Commissioner, Ralph Parsons, which ends: "We are told in Holy Writ to 'suffer fools gladly' and this we will do by God's help, but there must be a limit set."

His Lordship appears to have been equally bad-tempered when he encountered Kathleen in Winnipeg at a meeting sponsored by the Women's Auxiliary of the Missionary Society of the Church of England in Canada. She recounted the experience in a letter to J.C. Brooks, the Company Secretary:

> [The Bishop] suggested .... that I made these statements 'In order to gain cheap publicity' and .... I believe he said all sorts of unpleasant personal things against me in his lecture [which she did not stay to hear], as I received apologies from leading Church workers the day after. One .... said 'We all feel so badly that we pressed you to come to the meeting Miss Shackleton only to have you insulted.' I told her I didn't care, though I must say it was a bit 'Lay' of him to discuss my age from a Church platform. (He is reported .... as saying that 'The person who made these remarks ought to know better as she is no longer young!')

Brooks told her that he was "horrified" that the Company had become embroiled in the controversy. Kathleen, although sorry to have innocently placed the Company in an awkward position, remained unrepentant about her views. She did feel, however, that although she was "still sentimentally attached and desperately interested in the work and records", it would be better if she did not let herself "be associated any more (officially) with you." As Kathleen had seen with the fur trade employees, there could be a price of one kind or another to be paid by those who served the Company; she was not willing to pay it.

The portraits

The Fleming affair in no way spoiled the Company's pleasure when the 55 portraits arrived in London in the summer of 1938. Although the original intention had been to place the portraits in the archives, the Company had them mounted in attractive frames of limed oak and arranged with the Imperial Institute for a successful exhibit in the summer of 1939. The portraits were then hung in offices and waiting rooms in Beaver House, the Company's head office, so that staff and visitors could see and enjoy Kathleen's 'Men and Women of the North.'

In 1974 the Hudson's Bay Company Archives (HBCA) was transferred on loan to the care of the Provincial Archives of Manitoba. The Shackleton portraits have since become better known and more accessible, especially since 1980/1981 when the staff of the HBCA was increased, so that more attention could be paid to media collections. In March 1994 the Hudson's Bay Company announced that it had donated its corporate archives to the Provincial Archives of Manitoba and its museum collection to the Manitoba Museum of Man and Nature. The resulting tax savings have been used to set up a foundation which will provide financial support for the operations of the archives and museum. The staff of the HBCA archives is only beginning to come to terms with what this magnificent gift will mean. It is expected, however, that the HBCA will be able to develop a higher public profile and a more ambitious approach to outreach activities. The possibilities for the Shackleton portraits, as for other treasures of the HBCA, are certainly tantalizing.

Yet the Shackleton portraits have already brought much pleasure to Canadians in the last few years. Descendants of the people Kathleen sketched are delighted with the portraits. The HBCA does a fairly steady business in prints of John Firth of Fort McPherson (who fathered over 20 children) but recently a granddaughter of the river-boat engineer, John Sutherland, ordered so many coloured prints of Kathleen's sketch that the photographers gave her a reduction in price. Those who knew the men and women depicted also enjoy seeing the sketches. In 1991, the Keeper of the HBCA, Judith Beattie, showed slides of some of the portraits during a talk she gave in Fort McMurray. The picture of the river boat pilot, Johnny Berens (Fig. 1), prompted one woman, who had been a stewardess on the river boats, to say how secure she felt when Johnny was at the wheel; she never had to fear that the boat would suddenly run up on a sand-bar and cause her to drop the tea things in a passenger's lap.

Even those with no personal connection with the subjects of the portraits, such as the HBCA staff and those who have seen some of the sketches in exhibits at the Manitoba Archives Building, seem to find the portraits moving and absorbing. In looking at them we are reminded that a portrait is something that happens between human beings - subject, artist and viewer - and we share some of Kathleen's affection for the 'Men and Women of the North.'

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Fig. 2. Kathleen Shackleton portrait of Mrs A. M. McDermot "The Granny of the North", 1937. (HBCA, PAM - P-265)

Appendix 1

When this paper was presented at the 15th Polar Libraries Colloquy, Cambridge, 5th July 1994, it was followed by the showing of slides of 25 of the portraits, accompanied by the reading of the biographical notes prepared by the artist. What follows below is a list of all 55 portraits with shortened versions of the biographical notes, prepared by the Company for the exhibit at the Imperial Institute, 1939.

Hudson's Bay Men - Present and Past

1. John Sutherland	Aged about 75. Engineer on the Company's boats on the Athabasca and Mackenzie Rivers for 55 years.
2. Captain E.B. Haight	Aged 75. Retired river-boat captain. Among those sent by the Company in 1884 to assist in the transport of freight up the Nile for the expedition led by Sir Garnet Wolseley for the rescue of General Gordon.
3. Colin Fraser	Nearly 90 years old. Formerly an employee and later a free-trader. Son of [Colin] Fraser, who was piper and personal servant to the great Sir George Simpson.
4. Bob White	Aged 75. Both he and his father were in the Company's service.
5. Billy Loutit	For 44 years a pilot on the Athabasca River.
6. A.M. McDermot	Aged 76. Has completed 52 years service as a Trading Postmanager.
7. Mrs McDermot	A highly educated Loucheux half-breed.
8. Alex Kennedy	Indian. Also one of the Nile expedition voyageurs.
9. Pierre Mercredi	A Chipewyan half-breed. Formerly a Trading Postmanager, now retired after 40 years service.
10. Johnny Berens	Half-breed. Well-known pilot of the Company's SS *Distributor* on the Mackenzie River.
11. Jimmy Alexander	Son of a former Chief Factor of the Company.
12. William Cornwallis King	Aged [93]. The oldest pensioner of the Company and the only surviving Commissioned Officer under the old Deed Poll, which gave a share of the annual profits to the "Wintering Partners" in Canada.
13. George McLeod	Entered the Company's service at the age of 13 and has now completed 31 years service as shipwright and carpenter.
14. George Ellison [Elson]	A well-known guide at Moosonee Post, Northern Ontario.
15. "Long Willie" McLeod	A former carpenter
16. George Corston	Aged 76. Originally from the Orkney Islands. Formerly a blacksmith.
17. Willie Turner	A half-breed interpreter.
18. Tom Moore	Aged 61. Has been with the Company over 40 years, in Eastern Canada.
19. Fred Gaudet	An old pensioner. He and two other members of his family have a century of service between them with the Company.
20. C.H. French	Former Fur Trade Commissioner. Retired in 1930 after 40 years service.
21. John Firth	The "Grand Old Man" of the North. Originally from the Orkney Islands, he retired 20 years ago after 50 years service, and still lives within the Arctic Circle with his Indian wife.
22. Kenneth Stewart	Aged 74. A half-breed. Has worked for the Company at Aklavik (on the Mackenzie Delta).
23. Frank Aldous	Former Trading Postmanager in Ontario.
24. A.F.Camsell	Retired after 40 years service, but still lives in the North.
25. Johnny McPherson	Aged 50. A half-breed interpreter, of 37 years service.
26. T.C.Gaudet	Aged 65. A half-breed interpreter, who still works for the Company after 42 years service.
27. Ralph Parsons	The present Fur Trade Commissioner. Served for many years in the Eastern Arctic as Postmanager and District Manager, and was directly responsible for the extension of the Company's trading activities to Hudson Straits and Baffin Island.
28. T.A. Sinclair	Son of a former Chief Trader, and born at Oxford House (northern Manitoba), a Post established by his great-great-grandfather. Retired in 1936 after 41 years service.

29. W.E. Sheffield	A Trading Post manager.

Transport

30. H. M. Pierson	Formerly a freighter for the Company at Fort St. James; now runs his own transport company.
31. "Wop" May	One of the pioneer pilots of Canadian Airways Ltd in the North West. Had a very distinguished war record.
32. Mickey Ryan	Manager of the transport company on the portage between Fort Fitzgerald and Fort Smith on the Slave River; and an official of the Company's Transport Department.
33. Pat Ryan	Brother and partner of Mickey Ryan.
34. Pat Murphy	Also in the Ryan business
35. Tom Kelly	Also in the Ryan business
36. "Skook" Davidson	A famous old-time horse-packer who formerly worked for the Company.
37. Leonard Erikson	Formerly a cook on the Company's river-boats; now works for Mickey Ryan.

Law and Order

38. Cst. David Bellhouse	British Columbia Provincial Police
39. Insp. D.J. Martin	Royal Canadian Mounted Police
40. Insp. Curleigh	Royal Canadian Mounted Police
41. Cst. R.L. Crawford	Royal Canadian Mounted Police
42. L/Cpl. F.L. Wilson	Royal Canadian Mounted Police

Indians

43. Gregoire Daniels	Interpreter at the Company's Trading Post at Fort Chipewyan (Lake Athabasca).
44. Chief Jonas Laviolette	Fort Chipewyan
45. Benjamin Marcel	Fort Chipewyan
46. Joe Crowfoot	Grandson of the famous Chief Crowfoot who signed the Treaty with the British at McLeod, Alberta
47. Mrs Heavy Shield	A Cree, wife of a Blackfoot chief.
48. Joe Calfchild	A Blackfoot.
49. "Mista Jim"	Reputed to be 106 years old. One of the few remaining Indians who worked at the Company's old Post at Edmonton.
50. Mrs MacDonnell	About 80 years old. She is wearing the Montagnais head-dress.

Miscellaneous

51. Eddie Forfar	One of the best guides in northern British Columbia.

Eskimos

52. Lena Polluluk	A good trapper and hunter. Sketched at her husband's camp near Aklavik (on the Mackenzie Delta).
53. Kenneth Polluluk	Alaskan half-breed (Eskimo & Indian). Husband of Lena.
54. "Geepan"	Over 80 years old. From the Mackenzie Delta.
55. Johnny the Driver	From the Mackenzie Delta.

Alfred Wegener and his Greenland expeditions: collections of the Alfred Wegener Archive, Bremerhaven, Germany

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Abstract: Alfred Wegener's name was given to the German Institute of Polar Research that was founded in Bremerhaven in 1980. Although he understood the need for bi-polar research (conducted by the Institute nowadays), he himself only participated in Arctic research. He was a member of four expeditions to Greenland and he was leader of the last two in 1929 and 1930/31. The Alfred Wegener Archive in Bremerhaven collects material on Alfred Wegener's life and expeditions, especially the last one in 1930/31, during which Wegener died while trying to support the meteorological overwintering station "Eismitte" in central Greenland. Papers and documents related to this station and Wegener's death constitute the largest part of the Alfred Wegener Archive. However, diaries and photos also show the big efforts of all expedition members to fulfil Wegener's plans for a meteorological and glaciological profile of Greenland's entire inland ice cap. This was intended to answer questions about climate and climatic history of Europe. After Wegener's death his brother Kurt Wegener become the leader of the expedition, and subsequently editor of the expedition's results. The archive contains many letters related to this and other publications about the Wegener Expedition, and of course recent publications and biographies referring to Alfred Wegener. Wegener's results are being revised by recent research proposals of the Alfred-Wegener-Institute (AWI). Firstly, the AWI's activity in the European Greenland Icecore Project (GRIP) in Central Greenland near "Eismitte", also trying to elucidate climate history (of course with much more sophisticated methods than Wegener). Secondly there are several ice core projects at Scoresbysund, where Wegener's East-Station of 1930/31 was located and where he had started his crossing of the Greenland inland ice in 1913.

Key words: Alfred Wegener, Greenland, Wegener Archive, Bremerhaven, Alfred Wegener Institute for Polar and Marine Research, climatic history, glaciology

Introduction

Alfred Wegener is the most famous German polar explorer. He was born in Berlin in November 1880 and died on the Greenland Ice Cap in November 1930. In 1980 the "Alfred-Wegener-Symposium" in Berlin remembered the 100th anniversary of his birth and 50th of his death. During this meeting the Alfred Wegener Foundation was established by the union of 12 federations of geoscientists. In July of the same year, but quite independently, the German Institute for Polar Research was founded in Bremerhaven and was given the name of Alfred Wegener. The Alfred Wegener Foundation and the Alfred Wegener Institute support a small archive for the memory of Alfred Wegener at the Polar Institute in Bremerhaven.

Alfred Wegener Archive

The Alfred Wegener Archive started with a small collection of monographs, biographies and articles by and about Alfred Wegener. These publications show his work as a teacher of meteorology (Wegener 1911a, 1917, 1928a, 1928b, Wegener & Wegener 1935) and as the founder of the theory of continental drift (Wegener 1915, 1920, 1922, 1929, Waterschoot van der Gracht 1928) and of course as a polar explorer. Wegener took part in four Greenland expeditions. The first was the Danmark-Expedition to North-East-Greenland in 1906-08 under the leadership of Ludvig Mylius-Erichsen. During this expedition Wegener introduced the meteorological and glaciological results of the Danmark-Expedition (Wegener 1909a, 1909b, 1911b, Wegener & Brand 1909, Koch & Wegener 1911). Wegener's next Greenland expedition took place in 1912/13 under the leadership of the Danish glaciologist Captain Koch. It included an overwintering station in East Greenland with meteorological and glaciological observations and a crossing central Greenland from east to west covering a distance of 1200 km at heights of up to 3000 m. The popular book about his expedition "*Durch die weisse Wüste*" [Through the white desert] (Koch & Wegener 1919) and the scientific results, published in 1930 (Koch & Wegener 1930) give details of this expedition.

Most of the books in the Wegener Archive deal with Wegener's largest and last expedition to Greenland, the German Greenland Expedition in 1929-31. The last book written by Alfred Wegener himself is the popular report of the pre-expedition in 1929 to look for a

suitable place to bring up the expedition equipment for the main expedition. This book is entitled "*Mit Motorboot und Schlitten in Grönland*" (With motorboat and sledge in Greenland) (Wegener 1930). The popular book of the main expedition in 1930-31 was published in 1932 by his wife Else Wegener and his companion Fritz Loewe: "*Alfred Wegener's letze Grönlandfahrt*" (Alfred Wegener's last journey to Greenland) (E. Wegener 1932). The scientific results of the "German Greenland Expedition Alfred Wegener" were published by his brother Kurt from 1933-1940 (K. Wegener 1933-40). Kurt Wegener had taken up the leadership of the expedition after Alfred Wegener's death. In 1960 Wegener's widow Else Wegener published the first biography on her husband, reciting the story of his life and expeditions with the help of letters and diaries (E. Wegener 1960). Since 1980, the year of Wegener's 100th anniversary and 50th memorial, several additional biographies have been published by Martin Schwarzbach (1980, 1989), Hans-Günther Körber (1980), U. Wutzke (Wutzke, 1988) and the most recent by Klaus Rohrbach (1993). Of course the Alfred Wegener Archive collects all of them as well as the articles written by Wegener.

In 1983 the archive material was enlarged by the collections of two scientists, who had participated in Wegener's last Greenland expeditions in 1929 and 1930-31: the first one by the meteorologist Fritz Loewe (1895-1974), who had lived for some years here in Cambridge (Oct. 1934 - March 1937) on a scholarship from the Scott Polar Research Institute, before emigrating to Australia. In the summer of 1983 his widow sent her husband's documents about Wegener's expedition to Germany. In autumn of the same year the Alfred Wegener Institute received information about many documents, letters and photos about this expedition collected by Johannes Georgi (1888-1972) and placed in the meteorological office in Hamburg. Georgi had participated in the overwintering in Eismitte 1930-31. These documents were also taken to Bremerhaven and now constitute the main part of the Wegener Archive.

In 1989 the archive was given more documents related to Wegener's biography by his daughter Charlotte Wegener, a few months before she died. These documents contain his student books for Berlin, 1900, Heidelberg, 1900, and Innsbruck, 1901, a ticket issued for "public nuisance and disturbance" from his student time at Heidelberg, 1900, a medical certificate concerning a heart disease that made him unable to serve in the army from 1914, and several documents of scientific honours, especially his document of dissertation from 1904, and a document certifying him as being an honest member of the Company of Aviation of Hessen. We know that Wegener took part in many balloon flights before he introduced aerological methods to polar research. There are also documents certifying his membership in several scientific congregations.

Recent additions

The collection of Fritz Loewe contains material about the preparation of Wegener's expedition, photos and newspaper articles documenting the expedition. Of special interest are his original diaries from 1929 and 1930-31. Those of 1930-31 give a report of Wegener's last journey across the Greenland inland ice. Fritz Loewe and the eskimo Rasmus Villumsen were the only ones to accompany Wegener all the way to the overwintering station "Eismitte", having to bear temperatures below -50°C. Loewe had to stay there during the winter because his toes were frozen and had to be cut off with a pocket-knife and scissors by his companion Johannes Georgi. Wegener and Villumsen started of to the Weststation on November 1st, Wegener's 50th birthday, but never arrived there. Loewe's diary also tells of the winter in "Eismitte" with Johannes Georgi and Ernst Sorge, the glaciologist. Sorge dug a hole of 16 m depth to measure temperature and density in the ice. A typewritten copy of Sorge's diary was given to the Wegener Archive in 1991. Georgi, the meteorologist and leader of the station, published letters to his wife, written as a diary, in his book "Im Eis vergraben" [Buried in the ice] (Georgi 1932, 1955).

As already mentioned, the collections of Johannes Georgi make up the largest part of the Wegener Archive. There are many photos, letters and meteorological measurements. But the scientists of today decided that the scientific documents in these collections provided no further knowledge that is worthy of publication. Georgi, Loewe and others having already described the measurements of "Eismitte". More recent expeditions to the same region - such as the Expeditions Polaires Francaises from 1948-51 and the Expedition Glaciologique Internationale au Groenland (EGIG) in 1959-60 and 1967-68 - partly confirmed them. Still of interest today are the documents of the expedition and its participants, especially the great involvement and wide vision of Wegener himself. Of particular importance is the extensive collection of letters written in preparation for the expedition, mostly by Wegener himself, and the typewritten answers of Georgi, and the letters between Loewe, covering more than 40 years, (1929-71), documenting the story of their further lives and careers, as well as discussing problems and publications of their former Greenland expedition with Wegener. A big problem for Georgi, which is also discussed in these letters, was the reproach made to him by other expedition members blaming him for Wegener's death. He and Sorge had written an urgent letter to Wegener saying that they would leave the station "Eismitte" with handsleds on 20th October if no more support had arrived by then. Some people thought that only because of this letter did Alfred Wegener continue on his way to "Eismitte" in spite of the hard weather and thus died. Many letters in the archive show the correspondence of Georgi to his friends and

Photo: Alfred Wegener in Greenland, 1930.

opponents to refute this reproach.

In 1993 the Alfred Wegener Archive received new material about this affair. There were copies of letters and the diary of Karl Weiken from Potsdam, the surveyor of Wegener's Greenland expedition. Weiken's letters paint a different picture of Johannes Georgi to the collections of Georgi. He shared the reproach against Georgi, as stated in a newspaper article in 1934 by Kurt Herdemerten. The Archive material thus gives a rather complete picture of the arguments of both sides. Nevertheless we should listen to Wegener's widow, Else Wegener, who in 1932 wanted to end the discussion while "convinced that all the members had given their best as each one in his special situation could decide".

The correspondence asking permission for Karl Weiken to participate in the Wegener Expedition is also documented by a collection of copies given to the Archive in 1990 by the archive of the former Geodetic Institute in Potsdam, (at that time the Central Institute of the Physics of the Earth). The original documents could not be obtained by the Alfred Wegener Archive but made their way to the State's Archive of Brandenburg in Potsdam. Weiken's role was to measure the gravity of the Greenland ice by pendulum. Another part of the copies given by Potsdam concern the preparation of the publications by Kurt Wegener on the scientific results of the Greenland expedition. He corresponded not only with the expedition members, who were obliged to send him the results of their research, but also with Kohlschutter, the director of the Geodetic Institute who was a member of the Greenland Committee responsible for publishing the results of the expedition.

Another collection of copies made their way to the Wegener Archive after the fall of the Wall: correspondence by Hans Faruhn, the initiator of the Wegener-Museum in the former GDR in Zechlinerhütte. In Zechlinerhütte the memory of Alfred Wegener and his brother Kurt was revived in 1959, in the house in which their mother Anna Wegener was born. The letters written to Faruhn by Else Wegener, Georgi, Loewe and others show the gratitude of all of them that Alfred Wegener's name was associated with this place.

Recent developments

The Alfred Wegener Institute (AWI) carries on the name of Alfred Wegener not only by supporting the small Wegener Archive in honour of his name but also by recent research projects. We cannot discuss at this point in which way Alfred Wegener and his expeditions have influenced methods and knowledge of modern polar research. Fritz Loewe tried an account of it in his lecture to the German Society of Polar Research in 1972, "Alfred Wegener and the modern polar research" (Loewe 1972).

However, there are three glaciological projects of the AWI that continue Wegener's research proposals. One is at the ice margin in East Greenland at the Storstrømmen, where Wegener's and Koch's overwintering station "Borg" was situated in 1912/13; it is also located near Danmarkshavn that was given its name during the expedition of 1906-08. A second is the AWI participation in the European Greenland Ice Core Project (GRIP) in Central Greenland, which tries to answer Wegener's questions of the history of climate of the Greenland ice sheet; these deep drillings continue Sorge's digging and measurements of density and temperature in "Eismitte" in 1930/31. A third project is crossing the inland ice for glaciological purposes, just as Wegener and Koch crossed for their meteorological and glaciological research objectives in 1912-13. The recent traverses were laid from Central Greenland, where GRIP took place, to the north; next year they will be continued to the west.

So the Alfred Wegener Institute supports the memory of the pioneers of polar research by recent research projects, by the collections in its archive, and by carrying on the name of the most famous German polar explorer.

Acknowledgements:

I want to thank the former director to the Alfred-Wegener-Institute, Prof. Dr Gotthilf Hempel for allowing me to make my hobby my main profession. I also would like to thank the first president of the Alfred Wegener Foundation, Prof. Walter Kertz, who established the small Alfred Wegener Archive in Bremerhaven and supported my work in this archive for many years. However, this archive gained its real impetus through the contacts with the families of the participants of the last Wegener expedition to Greenland, especially the families of Alfred Wegener, Fritz Loewe, Ernst Sorge and Karl Weiken. In conclusion, I would like to thank those who supported me in the writing of this paper, especially my niece Kathrin, and Dr. Reinhard Krause, who will present the paper at the 15th Polar Libraries Colloquy. This is contribution no. 770 of the Alfred Wegener Institute.

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Admiral Richard E. Byrd and history: an assessment of his papers at the Byrd Polar Research Center, The Ohio State University

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Abstract: More than any other individual, Richard E. Byrd (1888-1957) was responsible for the continuing scientific and governmental presence of the United States in Antarctica. As a pioneer in aviation and aerial navigation, Byrd demonstrated that airplanes could fly in polar environments, first by flying in the Arctic in 1926 and then by using airplanes to explore and survey Antarctica during the remainder of his life. His employment of mechanical innovations in ground transport and in radio communications advanced the work of discovery beyond what had been accomplished in the "heroic age" of exploration. Byrd's achievements in his first two expeditions (1928-30 and 1933-35), were largely financed by private donations, and his stature as a national hero led to governmental activity in Antarctica. Byrd led or involved himself in the U.S. Antarctic Service (1939-1941), Operation High Jump (1946-47) and Operation Deep Freeze (1955-1956). The latter led directly to the U.S. participation in the International Geophysical Year and the continuing scientific research in Antarctica. Despite the public record of accomplishment, the papers of Admiral Byrd remained hidden and inaccessible to biographers and scholars for many years. In 1990 the Byrd Polar Research Center acquired the last of Byrd's papers. In 1994 the work of describing and making available the documentation of Byrd's career will be completed. The authors discuss Byrd's papers with reference to questions that have been asked by historians and to historical research that could be undertaken by using the collection.

Key words: Antarctica, Operation High Jump, Operation Deep Freeze

Introduction

More than any other person, Richard E. Byrd brought about the continuing scientific and governmental presence of the United States in Antarctica in the second half of the twentieth century. By the time of his death in 1957, Byrd had organized or taken part in seven expeditions to polar regions. As a young naval officer at the dawning of aviation, he proved that airplanes could function in the Arctic by flying to the North Pole in 1926. Throughout his career, Byrd used airplanes and other mechanical innovations to extend the limits of exploration. In 1928 and in 1933, he led two privately funded expeditions to Antarctica. As a result of these ventures Byrd became a hero to the public and made friends of the privately wealthy and the politically powerful. All of this work drew the attention of ordinary citizens to Antarctica. After 1935, when governmental agencies sponsored and directed the work of exploration and scientific discovery in polar regions, Byrd continued as the chief polar explorer in the United States. He led or participated in the U.S. Antarctic Service expedition to Antarctica in 1939 - 1941, Operation High Jump 1946 - 1947, and Operation Deep Freeze 1955 - 1956.

In some respects the career of Richard Byrd resembled that of Robert Peary, who claimed to have reached the North Pole in 1909. Both were career officers in the United States Navy and both dedicated their lives to polar exploration. Robert Peary had, and continues to have, critics who questioned his character and challenged his accomplishments. Byrd, too, was a controversial figure. He attracted friends whose loyalties would tolerate no questions of his accomplishments. His enemies would give him no credit (Rodgers 1990). Even after his death, a zealously devoted son guarded Byrd's papers and denied researchers access. One family legend is that Admiral Byrd's last words to his son, Richard Jr., were, "Dick, take care of my papers".[1] Unable to use Byrd's own papers, polar historians visited the Center for Polar Archives at the National Archives in Washington, DC and used the papers of other members of his private expeditions and the records of the government funded explorations.

Fortunately for researchers and for lovers of controversy, the papers of Admiral Richard E. Byrd are now available. In 1985 The Ohio State University acquired the first set of papers of Admiral Byrd. A second set arrived in Columbus, Ohio in 1990. Two years later, a grant from the United States Department of Education made possible the arrangement and description of the papers, a project that is nearly finished.

This paper has two parts. First is a brief overview of

the Byrd papers--their extent, formats, chronological range, and organization. A second and lengthier section evaluates the historical significance of the collection. Much of this evaluation will refer to specific questions that polar historians, biographers, and critics of Byrd have raised.

Overview of the Byrd papers

When measured by the number of containers alone, the Byrd papers are impressive. Researchers can use some 400 cubic feet of historic materials. If each cubic foot contained letter-sized paper alone, there would be more than 1.2 million items. Impressive, too, are the range of years documented in the collection and the varied formats of documentation present. The papers date from 1882 to 1980, a span of years accounting for all of Byrd's life and the lives of some of his children. In addition to letters and correspondence, the Byrd Papers include photographs and photographic albums, newspaper clippings, motion picture films, sound recordings, printed materials, and invoices and financial statements pertaining to the business of polar exploration.

Organizing the Byrd Papers into series--putting like with like for reasons of access and description--proved to be a daunting task. The collection was not only enormous in size but also in great disarray. It had been packed, moved and repacked many times before reaching The Ohio State University. Eventually, the papers were organised into fourteen series.

The first series contains Byrd's personal papers. These include correspondence with family members and the public, speeches, financial records, writings by and about Byrd, and family papers. A second contains all of the expeditionary records. These include the one with Donald MacMillan in 1925, the flight to the North Pole in 1926, Byrd's trans-Atlantic Crossing in 1927 (the third after Charles Lindbergh and Clarence Chamberlain), and five expeditions to Antarctica. A third consists of photographs which document Byrd's personal life and his expeditions. Documentation about Byrd's efforts to patent a navigational sextant is the fourth series. Series 5 is that of Richard E. Byrd, Jr., the son of the Admiral, who also had a naval and a polar career and was the chief protector of the Byrd papers. Newspaper accounts represent the sixth series. The seventh series consists of letters submitted for a Byrd Prize Letter contest held in the early 1930s. Information about Richard and Marie Byrd's stock activities constitutes the eighth series. A ninth series holds printed information about polar matters. The remaining five series have maps and navigational charts, motion picture films, phonograph records, audio cassettes, and artifacts.

Next to the series of personal papers, that of the expeditions themselves is the most voluminous. However, not all expeditions are equally documented. Some ended after only a few months while others lasted as long as two years. Even changes in sponsorship caused variations in the extent of documentation within the Byrd papers. For example, Byrd's third Antarctic expedition, that of the U.S. Antarctic Service in 1939, required that all participants file their papers with the National Archives. As the repository of the national government, the National Archives also has the records of the government financed Operation High Jump in 1946 and Operation Deep Freeze in 1955.

Of the expeditions within the Byrd papers, the most voluminous documentation is of Byrd Antarctic Expedition II (1933-1935) and Byrd Antarctic Expedition I (1928-1930), in that order[2]. The former constitutes approximately 53 cubic feet, the latter about 32. Conversely, the least well documented are the MacMillan expedition in 1925, Byrd's Trans-Atlantic flight in 1927, and Operation High Jump after World War II. All include one cubic foot or less of manuscript material. Surprisingly, however, the MacMillan expedition is second only to the first two Antarctic expeditions in the number of photographs contained in the collection.

The papers also reflect Byrd's longevity and stature as a member of a small community of polar explorers. For more than three decades he wrote and received letters from contemporaries and rivals. Thus, Byrd's papers contain letters and correspondence with such historic figures as Roald Amundsen, Lincoln Ellsworth, Sir Hubert Wilkins, Finn Ronne, Vilhjamur Stefansson, to name only a few.

As the task of arranging and describing the papers of Admiral Byrd nears completion, the project team will create two products. One will be MARC-AMC cataloguing records that will be shared with bibliographic utilities. Another will be a massive finding-aid that will describe the contents of each of the series at the box, folder, and even item level where appropriate. This finding-aid or register will also have a comprehensive index of personal and corporate names that appear in folder headings. Typically, Byrd's secretary created a file folder for any person with whom Byrd had more than one or two items of correspondence. The index of the finding aid lists all the names in alphabetical order and shows the pages on which a name appears. In this way, all the materials about a particular person appear in one place, even if the items themselves are in more than one physical series or container.

Researchers can use all of this material with one minor exception. As a condition of the acquisition, less than a cubic foot of letters between Byrd and his wife Marie, remains confidential until the deaths of all the children. Many of the letters between the couple in other parts of the collection are open to research.

Recently, the Byrd Polar Research Center Archival Program submitted a grant application to the National Endowment for the Humanities to microfilm most of Byrd's papers and many of those of another explorer, Sir

Hubert Wilkins. If funding is approved, the microfilm would not only preserve the information but enable the sharing of the collection with distant researchers by means of inter-library loans.

An historical assessment of the papers of Admiral Richard E. Byrd

Books by and about Richard Byrd and his contributions to polar exploration are many. The following draws upon the literature about Byrd and presents twelve questions about him as an explorer, as a public figure, and as a personality.

Byrd's caution and skill in organization

By all accounts Byrd was a cautious and meticulous organizer of expeditions.[3] In fact, it was not until 1946, during Operation High Jump of the U.S. Navy, that the first life was lost on an expedition involving Byrd.

The expeditionary records comprehensively document Byrd's attention to almost every detail in his organizational efforts. This is particularly evident in the records of his first two expeditions to Antarctica. These subseries abound with correspondence between Byrd and his associates and the producers of all types of equipment and supplies. This includes entire folders dealing with such items as watches and tobacco, as well as various types of food. Like other polar explorers, Byrd undertook a special interest in vitamins and nutrition, and this is reflected in his personal papers as well as the expeditionary records. The correspondence with suppliers also illustrates the Admiral's concern with making sure he and his crew had the proper clothing to survive the cold of Antarctica. Byrd's Navy training may have accentuated his attention to logistical detail, particularly in the area of personnel, who were meticulously screened before being selected or rejected.

Byrd as a navigator

Critics of Richard Byrd maintain that Byrd knew little about navigating an aeroplane. One author stated that Byrd's only navigational instrument in reaching the South Pole in 1929 was a bottle of cognac (Rawlins 1973, p. 272). Another, Bernt Balchen, was a comrade of Byrd's whose accounts have been a primary source of scepticism about Byrd and his accomplishments. Balchen assisted Byrd in the flight to the North Pole in 1926, served as a pilot on Byrd's trans-Atlantic flight in 1927, and was the pilot of Byrd's plane in flying over the South Pole in 1929. His controversial book, cast doubt upon Byrd as a navigator (Balchen 1958, p. 111-112, Montague 1971, p. 219-226, 255-267, 281-288).

Little evidence exists in the collection regarding Byrd's navigational skills. No annotated maps of his flights or diaries describing them can be found in the collection. The only indication of Byrd's knowledge of navigation in the papers is in the 7th series dealing with his work in inventing a bubble sextant in 1919. This series consists primarily of litigation records concerning the patent for this invention and describes Byrd's role as the inventor. In regard to the questions surrounding Byrd's North Pole flight in 1926, the papers provide no new insight.

The Byrd-Balchen relationship

Any reader of Balchen (1958) must have a sense of the hostility of Balchen to Byrd. Do the Byrd Papers shed any light on the relationship between the two?

There is correspondence between Byrd and Balchen from 1927 until 1932 that should certainly illuminate their relationship.[4] That the correspondence between them appears to have ended after 1932 is also revealing in and of itself. Balchen was an occasional topic of correspondence between Byrd and his family and others connected with the expeditions. Balchen did not publish his controversial autobiography until 1958, a year after Byrd's death. However, the Byrd family's view of the book appears in the collection in the form of letters from the Admiral's brother, Senator Harry Byrd, who impeded the publication of Balchen's narrative.

Advance Base - a publicity exercise?

One of the controversies of Byrd's second expedition to Antarctica from 1933 to 1935 was his decision to winter alone at a weather station in the interior of Antarctica called Advance Base. Byrd explained that this decision was based on the weather-related difficulty of moving enough supplies to Advance Base for the ideal number of three people (Byrd 1938, p. 27-28). Others have claimed that this decision was actually pre-planned so that Byrd would not share with others the attention of the public (Vaughan 1990, p. 172-180). Do the Byrd Papers offer evidence in this issue?

Significant material regarding this decision surfaced while processing the collection. Many of the radiograms to and from the expedition in the period from January through March 1934 comment extensively on this issue.[5] The correspondence in that same period between Byrd and his major financial backers is critical. So, too, are Charlie Murphy's communications with the outside world. Murphy, who was employed by CBS, served as Byrd's spokesman while the Admiral was at the Advance Base.

Researchers should also examine Byrd's pre-expedition correspondence with Victor Czegka and Norman Vaughan, both of whom had reasons to believe that they would be accompanying Byrd to Advance Base. Correspondence of these men is in Byrd's personal papers and in the expeditionary records.[6] Vaughan eventually chose not to go with the expedition and in later years, explained that he withdrew after hearing that Byrd intended to go to the Advance Base alone.

Operation No Jump

According to one historian, Operation High Jump of 1946 was a hastily conceived and executed effort to test and demonstrate the ability of the U.S. Navy to function in a polar environment. Byrd and his scientists were secondary figures in the expedition (Rose 1980). They expected, however, that another expedition would follow and make up for the disappointments of Operation High Jump. This expedition, called "Operation No Jump" never took place.

There is a small subseries (20 folders) in the expeditionary records about with this abortive expedition, which was to be called Operation High Jump II.[7] These papers contain justifications for the venture, along with the official reasons for the cancellation of the operation. They also include suspicions about political motives for the action. Byrd himself believed that President Harry Truman cancelled the expedition because of political strife with Senator Harry Byrd, the brother of the explorer.

Politics and Byrd's career

Byrd's brother, Harry F. Byrd, was a prominent United States Senator from Virginia and a leading figure in the Democratic Party of Presidents Roosevelt and Truman during most of the time that the Admiral was active in polar exploration. The Byrd papers say little about how his career was advanced or hindered by his family's influence in politics. They shed little light on whether or not Harry Byrd was active in pushing for government funding for his brother's expeditions. They also give no indication about whether or not the Senator was instrumental in Richard Byrd's promotions while on the Navy's retired list. The records of the abortive Operation High Jump II do contain allegations that the expedition was cancelled partly because of Harry Byrd's rivalry with then-President Harry Truman, but the documentation is not thorough.

Antarctic science

By definition, the work of exploration extends only to the boundaries of geography. Scientific investigation, on the other hand, continuously extends the limits of knowledge as one investigation builds upon the work of previous ones. In that sense, Byrd's most significant accomplishment may have been his last expedition, Operation Deep Freeze beginning in 1955. This expedition planned and established the scientific stations of the United States in Antarctica for the International Geophysical Year of 1957-1958, some of which have continued to be laboratories for scientific investigation.

Of all of Byrd's government funded expeditions, Operation Deep Freeze is the most thoroughly documented. Several folders in this subseries deal specifically with the International Geophysical Year.[8] Byrd saw Antarctica as a rich source of natural resources and felt that it was essential for the United States to establish a permanent presence there during the Cold War. Late in his life, Byrd often referred to Antarctica as the "Great White Continent of Peace." He believed that it could be a theatre of scientific cooperation between the United States and the Soviet Union. Byrd's correspondence with Laurence Gould, a veteran of his first expedition to Antarctica and a leading scientist during the International Geophysical Year is also valuable.[9] For the earlier expeditions, particularly the Admiral's first two expeditions to Antarctica, several reports of scientific activities and accomplishments are in the Byrd papers.

Byrd and public relations

The collection provides an impressive amount of detail on Byrd as a public figure, and his activities and accomplishments as a promoter of expeditions and of himself, particularly in regard to the National Geographic Society. Copies of the articles Byrd wrote for the Society's magazine are in the collection, as is the correspondence he exchanged with the organization. He also lectured before the National Geographic Society and copies of these are in the speeches subseries of Byrd's personal papers. Many of his speeches, both to the National Geographic Society and to other organizations, discuss the expeditions and were clearly designed to drum up public support for them. Byrd's lecture tours in the late 1920s and early 1930s are well documented in the papers, particularly in regard to the arrangements for these tours.

The contributions of philanthropists were essential to the success of Byrd's early expeditions, and the papers contain many communications with some of them , particularly John D. Rockefeller, Jr., and Edsel Ford. Byrd also utilized the media of mass communication to great advantage. This is documented in the papers through his communications with the New York Times, CBS, and other media outlets. The success of his promotional efforts is indicated by the voluminous news articles about his expeditions, the amount of fan mail he received, the number of children named for him, the public praise he garnered from politicians, and the private funding he obtained for his expeditions. Indeed, information on all of this pervades the entire collection.

Byrd's non-polar activities

Byrd's personal papers do reflect his advocacy of particular causes (Harrison 1984). In the early 1930s, he chaired the National Economy League and the records of this association are in the collection.[10] Later in the 1930s, he became an advocate for international peace.[11] Evidence of this appears in his speeches and in a series of letters devoted mainly to this subject. Among the groups he addressed was the Emergency Peace Campaign. After World War II, Byrd became active in a group known as Moral Re-Armament, which is also documented in the papers.[12]

Relationships with expedition members

Those who knew Admiral Richard Byrd referred to him as a notably private man who kept much to himself. For example, Russell Owens, the New York Times reporter, who accompanied Byrd on the first expedition, received a Pulitzer Prize for his reporting and wrote *South of the Sun* in 1934. This book discussed many of the other members of the expedition but had little to say about Byrd himself (Owen 1934, p. 228). In 1990 Eugene Rogers wrote *Beyond the Barrier: The Story of Byrd's First Expedition to Antarctic*. Rogers focused much attention upon Byrd supposed remoteness from the members of his party and his concern about their loyalty to him.

Byrd did continue to correspond with some members of his expeditions for several years after they travelled with him and these letters are in the collection. In some cases, Byrd gave references for former crew members who were looking for jobs. The amount of correspondence with the different members of the expeditions varies widely.

Byrd as a family man

In writing *Beyond the Barrier*, Eugene Rogers crossed the Victorian boundary that traditionally separates the outward accomplishments of a public figure from the inner workings of the personality of the hero himself. Historians will find much about the private life of Admiral Byrd in his papers.

The first subseries of Byrd's personal papers consists almost entirely of correspondence with his family members including his wife Marie, his children, his mother Eleanor, and his brothers Harry and Thomas.[13] These letters undoubtedly illuminate the relationships he had with each of them, not to mention their relationships with each other. Further evidence of this is in the papers of the Admiral's son, Richard E. Byrd, Jr., which constitute a 75 cubic foot series in the Byrd collection. In addition to correspondence, this series includes some of the younger Byrd's personal journals.

Conclusions

Rarely, if ever, does a single collection address all questions about an historic figure. Although the Byrd papers are extensive, there are gaps in the documentation. For example, the maps of the collection do not contain navigational annotations. Nor are Byrd's diaries present, though Byrd was known to be a keeper of diaries. Thus, the papers of Admiral Byrd cannot answer all the questions raised by polar historians.

There are, however, additional opportunities for research in the papers. One is the career of Lincoln Ellsworth as documented in the Byrd Papers. The correspondence between the two rivals is a significant new resource for polar history. Another is the activities of the Antarctic Associates in the late 1950s. Byrd was involved with this group late in his life and someone (probably Richard E. Byrd, Jr.) continued to receive material from the organization after the Admiral's death. A third area of investigation is Byrd's interest in vitamins and nutrition, due largely to his concern that he and his crew could maintain a proper diet in polar environments. His investigations of this are extensively documented in the collection.

Of course researchers themselves determine the historical value of a collection when they put their investigative skills and creativity to use. The Byrd Polar Research Center and The Ohio State University welcome researchers and look forward to cooperating in the advancement of historical knowledge.

Acknowledgement

The authors benefitted greatly from the assistance of Robert Matuozzi. As a graduate assistant, Mr. Matuozzi is a member of the processing team in arranging and describing the Byrd Papers. In addition, Mr. Matuozzi is using the papers to write a master thesis about Byrd. Mr. Matuozzi generously assisted the authors with his knowledge of the papers and of the literature about Byrd.

Notes

1. Based on a conversation of Raimund E. Goerler with Leveritt Byrd in June of 1990.
2. Files 5447-7135 (Byrd Antarctic Expedition II), Files 4361-5446 (Byrd Antarctic Expedition I)
3. Byrd's caution also became a point of criticism. His Trans-Atlantic crossing of 1927 was wide criticized for delays; so, too, was his second expedition to Antarctica in 1933. Byrd was also a fund-raiser who could not risk complaints of dangerously poor planning. Histraining as a pilot instructor for the U.S. Navy and as an inspector of accidents in pilot training made him particularly cautious in matters of aviation.
4. Files 1091-1095, 4335, 4399
5. Byrd Papers, Files 6763, 6809, 6840, and other surrounding files
6. Byrd Papers, Files 1424-1426, 3265, 4897, 6084, 6574.
7. Byrd Papers, Files 7328-7347
8. Byrd Papers, Files 7400-7402
9. Byrd Papers, Files 1761-1766
10. Byrd Papers, Files 2394-2478, 4114-4116
11. Byrd Papers, Files 699-727, 3503-3505
12. Byrd Papers, Files 2280-2283, 3513-3514, 4111-4113
13. Byrd Papers, Files 1-147

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Sir George Hubert Wilkins as scientist, geographer, and consultant to the United States military

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Abstract: The career of Sir George Hubert Wilkins is relatively unknown, especially in his native Australia. Besides being the first to fly the trans-Arctic Sea route, the first to fly an airplane over Antarctica, and the leader of the expedition in which a submarine travelled under Arctic pack ice for the first time, Wilkins was a scientist, photographer, newspaper correspondent, lecturer, geographer, author and a consultant to the United States Military. Those people who know of Wilkins's career remember him for his brushes with death, his spectacular accomplishments, and his relationships with famous polar explorers. However, Sir George Hubert Wilkins made significant contributions to scientific knowledge and to the United States military. For example, Wilkins collected flora and fauna samples for the British Museum, and his submarine expedition investigated the Arctic Ocean. This paper examines his work in Northern Australia and adjacent islands, and his career as a consultant on hot and cold weather clothing and survival techniques for the United States military, as two examples of the lesser-known accomplishments of this great man. The Sir George Hubert Wilkins Papers are located at the Ohio State University Archives and are open to researchers. The author, with the help of student assistants, processed the collection and compiled a finding aid.

Key words: Australian Aborigines, Alaska, Antarctic, Arctic, Australia, British Museum, Eielson, Nautilus submarine, survival techniques, United States military

Introduction

Sir George Hubert Wilkins, at a gathering of the Economic Club of Detroit, commenting on his expeditions to the Arctic and Antarctica, said:

> "I wanted to achieve a scientific purpose and in order to achieve that purpose I had to indulge in what people call adventure ... So I am now know as an adventurer."[1]

Born in 1888 in Australia, Wilkins is best remembered for his fantastic feats and near-death experiences. Two of his most notable exploits were the first trans-Arctic flight from Point Barrow, Alaska to Spitsbergen and the first airplane flight over Antarctica, both in 1928. Wilkins was credited with many firsts in polar exploration. Perhaps our fascination with death has drawn us to some of his more spectacular adventures. For example, as a young man seeking passage to London, he stowed away on a ship which was actually bound for Africa. He was almost thrown overboard when he was discovered by his angry hosts. During the Balkan War in 1912, while working as a photographer and newspaper correspondent, he was almost hit by a shell while photographing a battle, he was taken prisoner and nearly shot, and he almost died after contracting cholera. On 23 December 1912, Wilkins flirted with death while riding in a hot air balloon over London. He was filming a publicity stunt in which a man dressed as Santa Claus parachuted from the balloon and delivered Sandow's Chocolate to children in Hyde Park. The balloon drifted off course and nearly crashed into the English Channel. Following service with the Royal Australian Air Force during World War I, Wilkins competed in an air race from England to Australia. Wilkins's plane crashed on the island of Crete. Although no one was injured, Wilkins was quick to point out that they landed near an insane asylum (Thomas 1961, p. 17-62, 116-126). Most of his expeditions had some risk involved, though the ones most easily remembered are those that came very close to the edge of disaster.

Unknown accomplishments

The purpose of this paper, however, is not to dwell on the great accomplishments and the fantastic stories. Rather, I would like to continue a theme which Maria Pia Casarini-Wadhams (1989) used in the abstract of her thesis:

> "Because of its failure to reach the Pole the expedition fell into ill-deserved oblivion and its full story has not been told ... The conclusion is reached that the expedition was in fact a valuable one because of the importance of the scientific work carried out, and because of its influence on the postwar technical development of the under-ice submarine navigation by the United States Navy."

Her theme was to identify the relatively unknown accomplishments of Sir Hubert Wilkins as well as to comment on the rich material contained in the Wilkins Collection. She also illustrated very clearly that Wilkins was more than just an adventurer, contributing to both science and technology.[2]

The two areas of Wilkins' career that this paper will focus on are the Wilkins Australian and Island Expedition (1923-1925) and his consultancy work for the United States military (1942-1958). These two were chosen because they illustrate some of the little-known skills and accomplishments of Wilkins. The Australian and Island Expedition involved the naturalist, geographical, and cultural skills of Wilkins. Working with wild animals, unknown terrain, and aborigines provided a better understanding of both humans and their surroundings. His role as a military consultant involved his knowledge of the Arctic, his survival skills, and his views about military activities.

Australian and Island Expedition 1923-1925

Undiscovered Australia, written by Sir George Hubert Wilkins, discussed the efforts of Wilkins and his team during the Australian and Island Expedition. The book, however, may not tell the full story of the expedition. The notes, reports, and dozens of photographs in the Wilkins Collection may provide more insights into this fascinating expedition providing historians with another angle, substantiating the scientific accomplishments of Wilkins.

The natural history division of the British Museum hired Wilkins to explore the areas of Northern Australian and adjacent islands to collect samples of the fauna and flora. Wilkins had proven himself a capable expedition leader in both the Arctic (with Stefansson) and the Antarctic (with Shackleton).[3] Besides Wilkins, the scientific staff of the expedition included Vladimir Kotoff, mammalogist, J. Edgar Young, botanist, and O.G. Cornwall, ornithologist.[4]

Expedition reports and photographs

Wilkins's reports of the expedition contain descriptions of the topography, animals and climate. The photographs are most striking, including shots of animals, land, vegetation, and the natives. The expedition materials in the Wilkins Collection document at least three important accomplishments. First, Wilkins and his team collected specimens which enriched the collection of the British Museum. The specimens collected included snakes, squirrels, and wallabies. The petrogali, a small-rock wallaby, was a new species for the Museum. Found on the Goulborn Island, these wallabies, as Wilkins described them, liked to hop from ledge to ledge and they were very agile.[5] Crocodiles, the emu, and the goanna were other animals which Wilkins hunted. The crocodiles were numerous in the rivers of Northern Australia. The goanna were the only animals that the expedition discovered that looked like lizards.[6] In his reports, Wilkins not only identified the animals collected, but he also described their habits from hours of observations.

Second, the team surveyed land and rivers which had not been seen before or were surveyed incorrectly. The areas that the expedition team visited included Arnhem, Queensland, and the Cape York Peninsula. Wilkins's descriptions of the geography provided a better understanding of the natural surroundings of the specimens that his team collected. On one occasion, the team was navigating the Macmillan River, named by Dr. Logan Jack in 1880. Jack, however, did not trace the river to its outlet. The Australian Navy had subsequently mapped the coast line and identified two rivers; they named one Oliver but did not name the other. Wilkins and his team discovered that the Oliver River was actually the MacMillan and that the smaller, unidentified river entered the sea. The smaller river was named Harmer Creek to honour Sir Sydney Harmer, the Director of the British Museum.[6]

Thirdly, Wilkins spent time living with aborigines and learning their way of life. This was the most interesting aspect of the Australian and Island Expedition. On more than one occasion in his reports, Wilkins dispelled beliefs that these people were totally without civilised qualities. One story depicts a husband who was very concerned with his sick wife. Traditionally, Wilkins noted, the aborigines treated women like chattel. This man, however, cared for his wife and sent a runner to the nearest Mission Station for medicine. Later, after she recovered, the woman offered Wilkins some delicacies that had been received from the Mission Station because he had shown concern for her well-being. Certainly, this was not the typical picture one thinks of when discussing these people.[6]

The aborigines did display some of the behaviour which was commonly associated with them. In particular, cannibalism was evident. In fact, Wilkins was privy to many stories about how adults, children, the wounded, and the enemy became victims of this practice.[7] Even more significant is that fact that Wilkins gained the confidence of the aborigines. Wilkins is believed to be the first person to photograph a Groote Eylandt woman. Other photographs show rituals, ceremonial dress, and daily activities. Wilkins managed to secure the services of some of the natives to act as guides and assistants.[6]

The history of Arctic explorers depicts contact with groups such as the Eskimos. Some explorers were able to develop good relations with these people, or at the very least they respected the native culture and homeland. Others used force and intimidation because they were unable or unwilling to understand the differences in culture. The materials in the Wilkins Collection illustrate that Wilkins respected the culture of

the aborigines and was able to report his findings without prejudice.

Consultant for the United States Military (1942-1958)

The archival series entitled "Consultant Work - U.S. Military" is the largest series in the Wilkins Collection that focuses on a single subject. It consists of speeches and writings related to topics that range from surviving in the Arctic to the geography of Australia. Also included are reports, reference material, correspondence, and photographs.

The United States military was interested in Wilkins because of his experience in polar regions, his knowledge of climatology, his use of a submarine to travel to the Arctic, and his understanding of strategic military planning. Wilkins was involved in many projects during his consultancy career. His primary responsibility was to provide expert advice to the Army's Quartermaster Corps on hot and cold weather survival techniques. This, however, involved every aspect including, clothing, foot wear, cooking utensils, emergency procedures, temporary shelter, and diet. Wilkins was involved in the writing of an Army training manual as well as giving lectures to the students at the Army Indoctrination School in Alaska. In addition, Wilkins participated in two lecture series, one on the Arctic and the other on Australia. These series included issues concerning geography, economics, military, politics, and history.[8]

Potential research topics

The opportunities for research in this series include at least three different topics. First, there are the survival techniques. Wilkins not only worked in the polar regions, but he travelled to areas such as Pakistan, Egypt, Libya, and Syria to study climate, vegetation, topography, and people. In the polar regions and hot climate areas, Wilkins stressed the need for planning. During his exploring days of the 1920s and 1930s, Wilkins was involved in every aspect of the planning process. Two of the areas with which he was very concerned were diet and emergency procedures.

Wilkins had learnt from his polar experiences and from his time with the Australian aborigines that diet, especially the consumption of fat, was a very important consideration in both planning expeditions and in daily living. In the *Arctic Manual* for the United States Army, which Wilkins helped to write, trail rations include pemmican, a source of fat. In addition to pemmican, chocolate, raisins, dried fruit, nuts, or oatmeal were suggested for proper diet. The manual contained information on edible and poisonous vegetation found in the Arctic and sub-Arctic.[9] Emergency rations and diet control were crucial for explorers. Planning for several days or weeks of emergency rations and supplies were an important part of any expedition. Wilkins experienced this at firsthand when, in March, 1927, Wilkins and his pilot, Ben Eielson, were forced to crash land their airplane in the Arctic. Because of Wilkins's expert navigational skills and emergency preparedness, he and Eielson made it back to civilization.[10]

A second potential topic for research is the military aspects related to the strategic location of Alaska and the Arctic. From his days as a youth in Australia, Wilkins understood the importance of the location of the Arctic. At that time, he was interested in weather forecasting and establishing weather stations in the polar regions.[11] In 1931, Sir Hubert Wilkins led the Nautilus Submarine Expedition to the Arctic to prove that a submersible craft could travel there.[12] Sir Hubert Wilkins used his experience with the Nautilus to explain the important of the Arctic in terms of national defence and attack plans.

The ideas presented by Wilkins concerning the Arctic were typical of the military strategic planning of the early 1950s. Military historians might marvel at his idea of a submersible aircraft carrier, capable of taking a bomber to the Arctic undetected so as to launch a surprise attack on the enemy. Actually, Wilkins maintained that the threat of such a vessel and the use of the Arctic for surprise attacks was sufficient. He believed that the more threats you have in your arsenal, the more likely the other side would be to opt for peace.[13]

Even more interesting were the remarks of Wilkins after a trip to the Far East in 1941. In the address to the Economic Club of Detroit, Wilkins described his discussions with the Japanese and their plan to control the Pacific. The Japanese were interested in areas such as Australia, not for conquest, but for trade and cooperation. They needed more land to accommodate their growing population. The Japanese wanted to control the Pacific but not necessarily by the destruction of all other peoples living in the region. Perhaps these discussions inspired Wilkins to make the statement that war in the Pacific could have been prevented if Alaska had been offered as land for Japanese colonization.[14] Told that the Japanese would fight to the last man to defend their homeland, Wilkins offered his comments as a solution to war. Many, however, saw it as an act of treason.

A third topic for research is the technology and production processes for items such a fireproof clothing, camouflage, or equipment to be used in extreme climates. There is a reference in the Wilkins Collection that indicates that Wilkins actually tested the fireproof clothing himself. The author has not found an photograph to substantiate that statement, but the evidence is there that Wilkins liked to be involved in every aspect of a project.[15] Camouflage was a major project. Detailed reports show that every aspect related to clothing design was studied; vegetation, terrain, weather, durability of fabric, colour of fabric, and dyes used to paint fabric and equipment. Tent camouflage, for example, involved the study of the pitch in relation

to the terrain and fabric colour in order to avoid aerial detection.[16]

To the civilian, these problems may seem rather technical and of interest only to a small audience. However, these archival materials contain information which could be of interest to scientists or geographers. An analysis of trees in the Soviet Union is included in the camouflage report. The report includes type of trees location, leaf type, and bark colour. Weather data taken for areas in the American Arctic and Soviet Arctic may help trace the history of climatic change in the polar regions. Work in the desert regions document how the human body adapts to severe heat and lack of water.[16]

On 17 March 1959, in an eerie ceremony at the North Pole, crew members of the submarine USS *Skate* scatted the ashes of Sir George Hubert on the ice and snow.[17] It was a fitting gesture to a man who had given much to his adopted country. The ceremony itself was evidence of the gratitude that the United States military owed to a man who had helped improve many aspects of military training, science, and technology. The evidence is the fact that the USS *Skate* was able to travel to the North Pole, thanks to the efforts of people like Sir George Hubert Wilkins.

Conclusions

The scientific and technological accomplishments which resulted from the Australian and Island Expedition and consulting career for the United States military provide a more complete picture of the life and achievements of Sir George Hubert Wilkins. The most notable were:

1. The collection of rare specimens from Northern Australia and adjacent islands;
2. Observations and reports concerning the Australian aborigines;
3. Writings and reports concerning survival techniques and equipment;
4. Climatic, geographic, and topographic features of the Arctic, Alaska, Northern Canada, and the Soviet Arctic; and,
5. Designs for hot and cold weather clothing, including specifications for fireproof clothing.

In addition, Wilkins's understanding of the strategic location of Alaska and the Arctic helped the United States design defense plans and procedures in a period of history in which surprise military attacks and nuclear destruction occupied the minds of many people.

The Sir George Hubert Wilkins Papers are housed at the Ohio State University Archives in Columbus, Ohio. The collection has been processed into series, including expeditions, consultancy work, photographs, personal, and writings. A finding aid, with index, is available for researchers to review. The collection, like the life of Wilkins, is relatively unknown. In fact, the author has spoken with Australians who have indicated that Wilkins is not known in his native country. The Australians are trying to change this but the process has been slow. Thus, the author hopes that this paper has shed some light about the life and papers of Sir George Hubert Wilkins.

Notes

1. Wilkins Papers (RG 56.6), Box 5, Folder 1 - "Air Supremacy and the Control of the Pacific: Before the Economic Club of Detroit, April 20, 1942".
2. Maria Pia Casarini-Wadhams gave a presentation concerning the Nautilus Expedition at the Ohio State University Byrd Polar Research Center on December 9, 1993. Casarini-Wadhams researched the Wilkins Collection during her visit to Columbus, Ohio.
3. Wilkins was hired as a photographer of the Stefansson Canadian Arctic Expedition (1913-1916). He was chief of the scientific team and naturalist for the Shackleton Quest Antarctic Expedition (1921-1922).
4. Wilkins Papers, Box 32, Folder 15: "Photographs: Australia: 1923-1925".
5. Wilkins Papers, Box 14, Folder 1: "Wilkins and Australian Island Expedition: Reports: ca. 1923-1924."
6. Wilkins Papers, Box 32, Folder 15: "Photographs: Australia: 1923-1925."
7. *Ibid.* See also box 14, Folder 1: "Wilkins Australian and Island Expedition: Reports: ca. 1923-1924."
8. Thomas, 293. See also The Sir George Hubert Wilkins Papers, Box 1, Folder 15: "Biographical Sketches: Wilkins, Sir George Hubert: 1944-1983 an undated."
9. Wilkins Papers, Box 6, Folder 12: "Writings-Wilkins: Cold Weather Climates - Clothing and Survival Techniques: ca. 1942-1945." See the *Arctic Manual*, 1944, pages 63, 92-95, in this folder.
10. Thomas, 189-199. "Out of the North Came Two Dead Men" by Edward A. Herron (*Pageant*), August, 1955) described this experience. This article is in the Wilkins Papers Box 15, Folder 4.
11. Wilkins Papers, Box 1, Folder 15: "Biographical Sketches: Wilkins, Sir George Hubert: 1944-1983 and undated." Wilkins grew up on a sheep farm and his family was constantly faced with moving the herds to water. He became interested in ways to determine weather patterns to assist in agriculture.
12. Sir Hubert Wilkins, 1931: in his chapter "The History of the Idea", p. 3-51, Wilkins explained that his plan was inspired by the book by Jules Verne, twenty thousand leagues under the sea, and the writings of Bishop John Wilkins (1614-1672). Wilkins explained that the Bishop was his ancestor. Bishop Wilkins wrote possibility of constructing a

vessel to move under water. Wilkins also had discussed his idea with Vilhjalmur Stefannson, Lincoln Ellsworth, and others.

13. Wilkins Papers, Box 6, Folder 4: "Writings-Wilkins: Arctic- comments on strategic importance of Alaska/Arctic and related information: 1951-1953 and undated."
14. Wilkins Papers, Box 17, Folder 15: "Alaska as a Japanese Colony called War Solution: Statement by Sir George Hubert Wilkins: 1942."
15. Wilkins Papers, Box 4, Folder 13: "Report: Report on the Personal Activities of Sir Hubert Wilkins for the Period 1945-1957." See the speech by General Middleswart, October 14, 1954, in this folder. General Middleswart mentioned some of the lesser known accomplishments of Wilkins.
16. Wilkins Papers, Box 6, Folder 10: "Writings-Wilkins: Camouflage: Notebook - minutes, suggestions, diagrams: 1950."
17. Thomas, 296. See also the Wilkins Papers, Box 2, Folder 23: "Memorial Service: USS Skate at the North Pole, March 17, 1959." The United States Navy also took Suzanne Wilkins's ashes to the North Pole in 1975.

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New developments in oral history

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Abstract: This paper describes the programs developed on interactive computer workstations and how this approach changed the way oral history interviews are conducted at Rasmuson Library. This new approach enables a fuller accounting of each interview and an easily accessible comparative record of the entire corpus of interviews in each program. Recognizing that the words recorded in an interview are only indications of the communication that took place, we must find ways to lead future listeners to a greater appreciation of the meaning that the speakers were trying to convey. The interactive workstation format allows design of formats which provide this type of information while preserving the integrity of the recording.

Introduction

Back, almost ten years ago, the University of Alaska experienced a severe budget cut. Staff support for oral history was eliminated and my appointment as Curator of Oral History at the Elmer E. Rasmuson Library was reduced from a twelve to nine month appointment. The program became dependent on student help. The students often did a good job processing tapes, helping patrons find recordings, retrieving recordings, copying and refiling, but like all student jobs, there was considerable turnover and it was very hard to keep track of recordings and maintain consistent indexing standards. On a Thanksgiving Day camping trip with my Swiss friend, Felix Vogt, I voiced my interest in a system that could maintain the recordings and make them accessible to a large number of people without depending on individual staff members and their knowledge of the collections. The project interested Felix and he decided to write his masters thesis on the feasibility of using computers to store and retrieve oral recordings. His study and the grant he wrote to Apple Library of Tomorrow launched us into digital sound recordings and what we now refer to as "Project Jukebox".

During the following two years, Dan Grahek, a computer specialist on our staff developed the actual hypercard programming which we use in our various jukebox programs. While the initial idea was just to store audio in digital form, Dan recognized the potential to add images, maps and texts. We now look for and create photos, maps, and text to enhance the user's understanding of the recordings. Sometimes these enhancements include photographs from personal collections, sometimes from our archival collections. We have used standard USGS maps and more specialized illustrations and drawings. In some of our programs we use biographies and in all cases we use context statements to orient the user to the speaker and their background, the interviewer, and the circumstances surrounding the recording.

The Programs

The National Park Service has supported us to develop programs in Yukon-Charley Rivers National Preserve, Gates of the Arctic, Denali, and Wrangells-St. Elias National Parks. In addition, we have programs funded by the North Slope Borough, the Fairbanks Native Association, the Tanana Native Village Council, and the Yukon-Flats School District. This spring we initiated an internship program, an idea originally proposed by Jane Demmert at a meeting with Sealaska Heritage Foundation. Jane recommended that we recruit interns to come to Rasmuson. Here they would select a number of recordings from their home region to digitize for return home in the form of a compact disk. Once home, they would teach community members how to use the disk. Under this plan, the Rasmuson Library maintains a copy of the disk for patrons to use. We now have four interns reviewing tapes and creating outlines-two from Fort Yukon, one from Hoonah, and one from Rampart. (Generous support has been received from the library, from the Interior Campus of the College of Rural Alaska, from the Faculty Small Grants Program, the President's Grant Program, and from groups sponsoring the travel, room and board and tuition of the interns.)

The internship program is particularly significant because we are working with our existing collections, extending their life and making them more accessible to users. The interns will make reel to reel copies while they are digitizing into the computer. This means that for every original, we create a digital storage tape, a reel to reel analog tape, and two compact disks. That's a lot of preservation.

The projects just described have already produced a sizable digital archive, of over 150 recordings. If we can get grant or foundation support to continue the

internship program on a multi-year basis, then we will make a sizable impact on preservation and access to our holdings at Rasmuson.

Organization of information

Each of these projects challenges us to find the most appropriate ways to present information. In the case of the Chipp-Ikpikpuk and Meade Rivers Oral History Project, we used pictures of the narrators as one way to access their recordings. The North Slope Borough and the Fort Yukon photo albums are designed to look like their paper counterparts but the computer lets us do some special things. We can zoom an image up to large scale to show detail, we can provide identification, and we can access individuals talking about each image. Several of our projects call for reference to historic sites and the computer is programmed to link maps showing particular sites with the interviewer's descriptions of the places. We also link topical searches to particular sections of the interviews where the subject is discussed. In all these cases the computer sorts and compiles sources to create a comparative database for the user to review.

Lines of inquiry

One of the nicest features of the Jukebox is the opportunity to pursue particular lines of inquiry. For example, in the Jukebox now being designed for Wrangell-St. Elias, big game guiding is a particularly important and sensitive topic. This has traditionally been a big game hunting area and the 1980 legislation creating the park places new regulations on this activity. Consequently, many peoples' livelihood and way of life are affected. To pursue this line of inquiry in our interviews we asked about the history of big game guiding, types of clients, establishment of guiding areas, guiding with horses, the use of aircraft, and, before we are finished, we will interview the Park Service administrators on policy.

In this example, we sought out people to interview who could give us perspectives on guiding: Lorene Ellis talks about how she created a guiding way of life out the Nabesna Road; her son, Kirk, tells about flying clients into remote areas to hunt; and Lenora Konkle describes the life she and her husband built guiding in the Wrangell Mountain and her efforts to hold on to a part of that world. Bill Etchells is now farming on the Edgarton Road, but he started off guiding and in his interview he gives a graphic description of swimming horses across streams on their way to remote camps, and outfitting super cub airplanes for the special flying conditions demanded of guides. Each of the perspectives on guiding will be highlighted in a search category and will be accessible by key words. Our job does not end after we complete the interview. We write the context statements, acquire the supporting photos and maps and determine the organization of the final program. Unlike writing a book, where the writer leads the reader through a linear progression or argument, Jukebox provides windows to many different perspectives on the issues. Users can choose to follow the key word searches or browse through the unedited interviews.

For instance, in the Fairbanks Native Association Jukebox, we organized the major categories to reflect the elements which influenced the organization's history and the range of topics covered in the interviews. Mary Larson, the director and designer of this project, developed a series of short introductory slide shows to visually orient users to the topics and to explain connections between some of the activities which shaped Native experiences in Fairbanks- spring carnival, dog races and the annual Native potlatch, Native leadership concerns which led to the Alaska Native Claims Settlement Act, and the evolution of services by FNA to Natives in the Fairbanks area. We expect that some users will follow the structure and others will just get interested in listening to one of the narrators and seeing how that person speaks about the connections between topics such as dog mushing and the annual FNA Potlatch.

When we jukebox collections of tapes already in the archives then we look for interviews that fall into a general category of interest and the more specific lines of inquiry are created when we review and choose key words. For instance, Native leadership is emerging as a common theme in many of the interviews selected by the interns and we can safely say that these collections will provide perspective on that issue, maybe at the category level, certainly as a line of inquiry. Ken Austin, an intern from Hoonah in Southeast, is finding that many of the Tlingit he selected for his compact disk talk about protocol and proper behaviour and so this will surely become an organizing principle.

In the case of the project we are doing with the village of Tanana, Patty Bowen, a school teacher from the community, selected about 23 recordings from our holdings at the Rasmuson Library. The recordings cover many diverse aspects of life in the Tanana area. One organizing principle will be a map of the places mentioned which will demonstrate to younger people some of the sites where their parents and grandparents lived before consolidation into settled village life. The map will serve as an organizing and supporting structure for the Tanana Jukebox. I knew that the elders she selected came from a wide area, but until she had produced outlines of their interviews, I did not realize how important it was to demonstrate this point visually.

Another organizing feature of the Tanana Project will be Patty's context statements which explain why she selected each individual and how she remembers them. This perspective will be complemented by excerpts from

recorded discussions with other elders describing how they remember the people Patty chose to feature. The important point here is that the elders have created a personal window back to the narrators. It is a close relative who recalls when she was a small girl meeting Abby Joseph. They used to stop at Abby's camp when they travelled and Abby always had something good for them to eat. In other cases, it is special help or attention that the elder gave to them. In each case, because these contextual comments are made by people the listener knows well, and because the narrators had an impact on their lives, those of us who do not personally know the narrator, can begin to feel a connection to the narrator's life and the story they told many years ago.

Why is Jukebox the way to go?

Sometimes when we can not get the computers to work, when we have spent hours on a project but discover the machines were not storing our efforts, we may wonder why we do not do things the old way - analog tape and traditional preservation practices.

Not for long though! It makes more sense from archival and oral history perspectives to blaze this new trail. From an archival standpoint, it makes sense to fully index and make searchable recordings before they are shelved so that patrons can move quickly and systematically through tapes to find information. If users can operate from an interactive workstation without assistance and we don't have to retrieve recordings and copy originals, then this will save staff time. With the computer, there is no reshelving; tapes remain in order for the next user. The programs are self-contained so multiple copies can be made for other sites. In terms of preservation, we feel that our investment in digital recordings is sound even if some of our efforts are not in conformity with established archival standards (i.e.. those cases where we made cassette instead of reel to reel copies). From a preservation perspective, digital recordings are the way of the future. There are two big questions: what will emerge as the best format for long term storage; and what will the standards be for digitizing and sound compression. At this point, we must be very careful to ensure that our digital masters can be easily transferred to new formats if that becomes necessary.

Our preservation and access efforts are now driven by the funding sources that evaluate and decide if they wish to support our proposals and the interns who select recordings for their jukeboxes. For funding sources, we design projects that will be attractive to them and that permit us to highlight what we consider to be important parts of our collections. With the internship project, the choice of which recordings to select is up to the interns and they must weigh audio quality, subjects covered, and the interests of community members back home.

Should an archival program be driven by grants and interns? I think that, given the current economic climate, this is a necessity and I would also argue that the projects funded and the recordings selected so far by the interns are worthy of the work and attention, even if they might not be the most endangered. Our new partnerships in archival management allow us to preserve far more than we could if we just relied on the allotted library budget. Our work with funders and the interns is widening our appreciation for what is historically and culturally important.

The oral historian and the archives

In the new scenario, the researcher/recorder/documenter emerges as responsible for going beyond recording the speaker's words to preserving as much as possible of the meaning that was conveyed in the interview. As noted, we do this with context statements, photos, and excerpts from written and oral documents.

My colleague, Mary Larson, uses the analogy of a stage manager in theatrical productions. Her emphasis is on the interplay of many recordings available in a jukebox designed to tell various stories. The manager (oral historian) must "...make sure that all of the actors (or the individuals interviewed) show up on time, and they make sure that all of the props are there to create a context for the audience. But audience members are left to view the performance and form their own interpretations" (1994, p. 2.).

Kirsten Broderson, a graduate student working in the Oral History Office, points out that this act of making oral interviews available to audiences in a jukebox format is what folklorists might call "contextualization" and "recontextualization", in that we are structuring screens to provide ways of searching and lumping like categories together to give listeners our understanding of the background of each interview (Bauman & Briggs 1990). We are translating meaning which involves interpretation of the context as well as the words spoken. This seems to me to be very close to what Renato Rosaldo means when he says that, "Doing oral history involves telling stories about stories people tell about themselves" (1980, p. 89). At first glance, some may cringe at the thought of oral historians interpreting; it sounds so different from the usual image of faithful recorder. But I hope that the examples that I have shown you this afternoon have not scared you into thinking that we are distorting peoples' words. I hope that you will agree that enhancements such as a map showing the places people described in their interview, a picture of the activity or subject described or a statement by an old friend who tells how she remembers the storyteller provides bridges of understanding for those who do not know the narrator or their subject.

The bottom line is that oral historians of the nineties must continually ask themselves how to present the information to other people. The challenge is to find

ways to help people imagine and understand the narrator's story, and that means attention to far more than the words recorded on the tape.

Acknowledgments

I wish to thank members of the Alaska and Polar Regions Department who received earlier drafts of this paper. Special thanks to Elizabeth Cook for photographic and editorial assistance and to Richard Veazey, head of the photographic unit at Rasmuson Library, for developing the slides. Thanks to Kirsten Broderson for the important discussions on contextualization.

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The Ancestors files in *Polarpac3* and projections for *Polarpac4*: an overview

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Abstract: The Ancestors files consist of approximately 48 000 references for locating information about early Alaska and neighbouring Canadian pioneers and were included in *Polarpac3*. Previously the database was available only at the Alaska & Polar Regions Department, Elmer E. Rasmuson Library. This paper discusses the contents and use of the database and proposed future enhancements. *Polarpac4* is scheduled to contain 128 000 citations from a wide variety of sources.

Key words: PolarPac (CD-ROM), CD-ROM -- polar regions, ancestors, Alaska, genealogy, biographical sources

Introduction

The purpose of this paper is to acquaint librarians and researchers with the "Ancestors" files available on *Polarpac3* and the projections for *Polarpac4*. "Ancestors" is a 49 712-citation index to sources of information on early settlers and pioneers in Alaska and neighbouring Canadian communities. Until *Polarpac3*'s release, "Ancestors" was available only for in-house use at the Alaska & Polar Regions Department (APR) of Elmer E. Rasmuson Library at the University of Alaska Fairbanks.

During the Polar Libraries Colloquy in May, 1992 at Columbus, Ohio, the unofficial Colloquy PolarPac Group met and discussed the possibility of adding the "Ancestors" files to *Polarpac3*. It was recommended that the records be added because WLN was able to convert the existing records to a MARC format, funding was available, and Alaskan and neighbouring Canadian libraries continue to have an ever growing demand from individuals searching for information about early pioneers and settlers.

Contents of Ancestors in *Polarpac3*

The major portion comes from *The Alaska People Index*, which was compiled by Connie Bradbury, David Hales, and Nancy Lesh. The data was later converted to an in-house database by Jeff Pederson at APR.

The following are the sources indexed in *Polarpac3*. All are from the *Alaska People Index* database with the exceptions of the *Anchorage Times Obituary Index* for 1981-1990 and 1991-1992 and the *Pioneers of Alaska Index*.

Alaska Department of Mines. *Report of the Commissioner of Mines to the Governor*. Juneau: The Department, 1936.
This report contains information regarding individuals who were killed in mining accidents in Alaska. Many entries include detailed information about the circumstances of the accidents.

Alaska Sportsman, 1935--1969 and *Alaska* magazine, 1970--1985.
Indexed are articles with biographical information about individuals. Most entries are from the "From Ketchikan to Barrow" and "End of the Trail" columns. Names of all individuals, such as spouses, children, parents and siblings, mentioned in the obituary notices during 1935-1981 are included. Therefore, individuals listed in "Ancestors" may not have an obituary notice in the source document, but will be listed in relationship to the deceased. These names were added because of the importance of relationships in genealogical and family history research.

Atwood, Evangeline and Robert N. DeArmond, ed. *Who's Who in Alaska Politics*. Portland: Binford and Mort for the Alaska Historical Commission, 1977.
A compilation of biographical sketches of Alaskans involved in political circles.

Jeffrey, Edmond C. ed. *Alaska: Who's Here, What's Doing, Who's Doing It*. Anchorage: Jeffrey Publishing Co., 1955.
A compilation of early Alaskan residents and business people.

Pioneers of Alaska Index. Alaska: Alaska & Polar Regions Dept., Elmer E. Rasmuson Library, University of Alaska Fairbanks. (Unpublished.)
This is an index to the membership records of the Pioneers of Alaska. The collection is housed at the APR Archives. The archival staff is not allowed to provide any information that is not included in the indexing records. Permission to view the original records must be obtained from the Pioneers of Alaska.

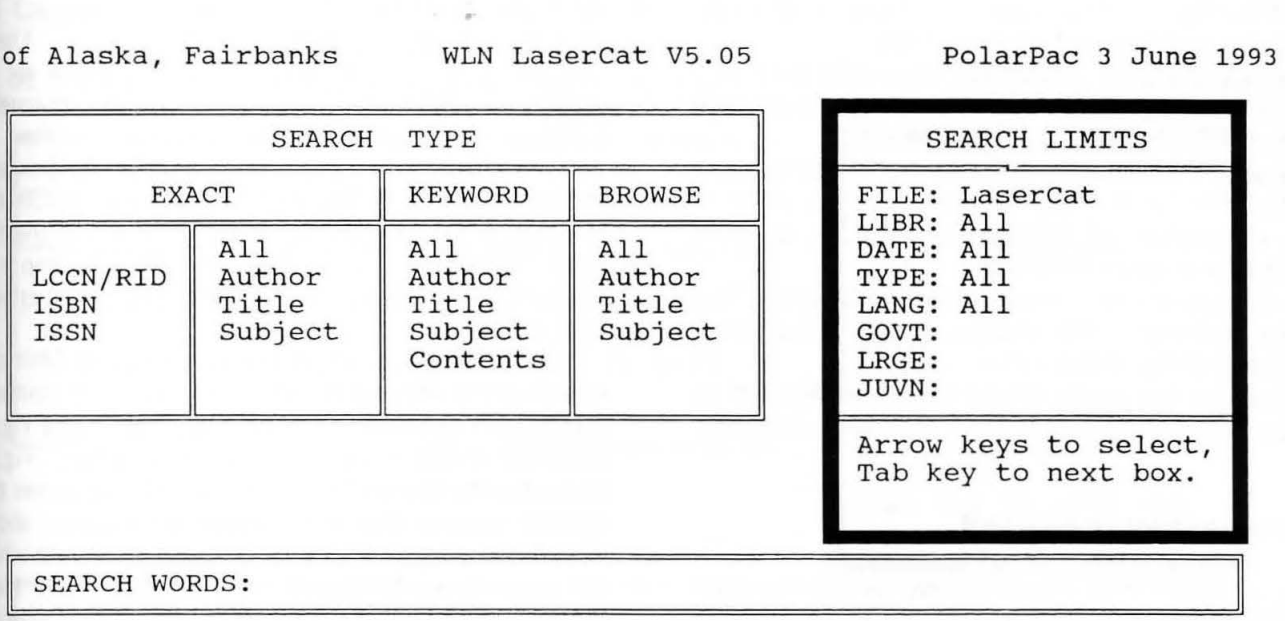
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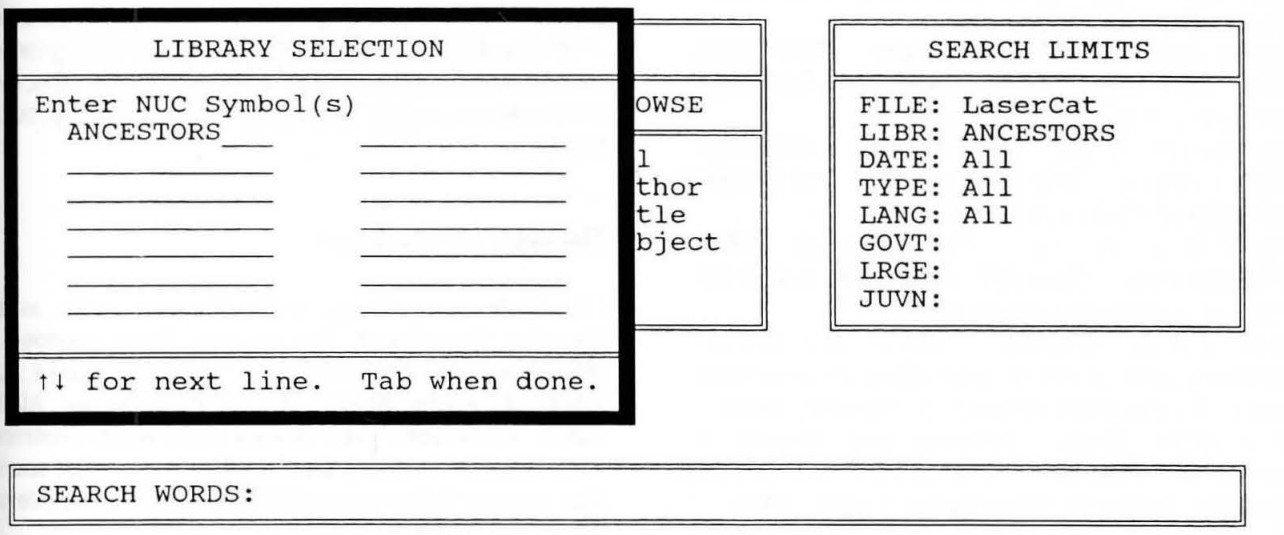
Fig. 1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F1-Help F3-Combined Search
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Fig. 2

Samuels, Barbara, ed. Anchorage Times Obituary Index 1981–1992. Anchorage: Alaska Collection, Anchorage Municipal Libraries, 1991.

Samuels, Barbara, ed. *Anchorage Times Obituary Index, 1991-92*. Anchorage: Alaska Collection, Anchorage Municipal Libraries, 1991. (unpublished)

Tewkesbury's Who's Who in Alaska and Alaska Business Directory. Juneau: Tewkesbury Publishers, 1947.
A compilation of biographical sketches of early Alaskans involved in business.

U. S. Fish and Wildlife Service. *Alaska Fishery and Fur-Seal Industries*. Washington, D.C.: Government Printing Office, 1914, 1917.
These are lists of the Alaska Native residents of St. Paul Island as of June 30, 1914 and March 31, 1917.

Sources scheduled for *Polarpac4*

APR, with David A. Hales serving as the Principal Investigator, was awarded an Interlibrary Cooperation Grant from the Alaska State Library in July 1993. The funds assisted in the costs associated with adding approximately 80 000 names to *Polarpac4*. The new edition of this popular CD-ROM product is scheduled for release in early 1995.

Citations from the following sources are scheduled for inclusion in *Polarpac4*.

Alaska Census, 1900. (Primarily interior region.)
This data has been extracted from the census record by Dr. John Cook, who works for the U.S. Bureau of Land Management, Fairbanks District.

Alaska Mine Inspector. Report of the Territorial Mine Inspector to the Governor of Alaska. 1915, 1916, 1920, 1921, 1922, 1923, 1929, 1931, 1933, 1950, 1952, 1954, 1956, 1958.

Anchorage Daily News Obituary Index. 1993–April, 1994. Anchorage: Alaska Collection, Anchorage Municipal Libraries. (unpublished.)

Chang, Tohsook P. and Alden Rollens. *Anchorage Times Obituaries Index, 1915-1965*. Anchorage: University of Alaska Anchorage, 1979.

Chang, Tohsook P., ed. *The Anchorage Times Obituaries Index, 1966-1980*. Anchorage: University of Alaska Anchorage Library, 1981.

Harrison, Edward Sandford. *Nome and Seward Peninsula; Book of Information About Northwestern Alaska*. Seattle, Washington: E. S. Harrison, 1905.

Index of Births, Deaths, Marriages, and Divorces in Fairbanks, Alaska Newspapers, 1903–1930. Fairbanks: Fairbanks Genealogical Society, 1986.

Polk's Alaska-Yukon Directories, 1901, 1903, 1905, 1907.

Prince Rupert Pioneers Association. *Charter Souvenir*. [Prince Rupert, B.C.: Prince Rupert Pioneers Association, 1914.]

Search strategy

With the "Ancestors" files indexed in *Polarpac3* all subscribers to this CD-ROM now have access. Users can search for a name while using the entire set of records or while using the Ancestors file separately. Limiting the search to the "Ancestors" files is accomplished by tabbing to the "Search Limits" box and then pressing the F5 key (Fig. 1). This now places the searcher in the "Library Selection" box where the file name "Ancestors" is entered (Fig. 2). The next step is to tab back to the "Search Limits" box when "Ancestors" appears (Fig. 3).

While *Polarpac3* allows the researcher to limit the search to the "Ancestors" file, doing so could limit the information available. For example, Fig. 4 and Fig. 5 show the results of the two types of searches. Fig. 4 illustrates the limited "Ancestors" search and shows the specific sources that will contain information about Robert Bruce Atwood. Fig. 5 illustrates the results when the search is not limited to the "Ancestors" files. Here the researcher finds a reference to Mrs. Robert Atwood as well as two articles about Mr. Atwood. The contents of the two articles may contain information that would be very important. The search is greatly broadened when searching through the key word files. While it becomes more cumbersome to sift out the information that pertains to the individual, it provides the researcher with access to many other items that may be of value.

Samples of the types of information indexed in PolarPac

The type of information that researchers find from the sources listed in "Ancestors" varies. Some sources provide considerable information while other sources provide little. Fig. 6 and Fig. 7 are sample illustrations.

In searching for information about the early pioneers of Alaska and neighbouring Canadian communities, even brief references can be helpful in piecing the puzzle together.

The future of "Ancestors"

The Rasmuson Library, with Gretchen Lake as the Principal Investigator, has recently been awarded an Interlibrary Cooperation Grant from the Alaska State Library to index additional editions of Polks' Alaska-Yukon Gazetteers. The Alaska Gold Rush Centennial Task Force is working toward identifying other sources that contain information about the early stampeders to Alaska and the Yukon.

U. of Alaska, Fairbanks WLN LaserCat V5.05 PolarPac 3 June 1993

SEARCH TYPE			
EXACT		KEYWORD	BROWSE
LCCN/RID ISBN ISSN	All Author Title Subject	All Author Title Subject Contents	All Author Title Subject

SEARCH LIMITS
FILE: LaserCat LIBR: ANCESTORS DATE: All TYPE: All LANG: All GOVT: LRGE: JUVN:
Arrow keys to select, Tab key to next box.

SEARCH WORDS:

TITLE KEYWORD ""
F1-Help F3-Combined Search F5-Other Sel↵ To Begin Search
ALT-E To Exit

Fig. 3

U. of Alaska, Fairbanks WLN LaserCat V5.05 All Index Display

->V Atwood, Robert Bruce.
V Atwood, Robert Bruce, b. 1907.
V Atwood, Robert, Mrs.
t Mrs. Robert Atwood.
t Robert Bruce Atwood.

ALL KEYWORD "ROBERT ATWOOD" - End -
F1-Help F2-Return F3-Select Rec F4-Select Page F5-Brief Recs↑↓ PgUp PgDn Home
F10-Print ESC-New Search

Fig. 4

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 U. of Alaska, Fairbanks      WLN LaserCat V5.05              All Index Display
Items
   10->V Atwood, Robert.
    1  a Atwood, Robert B.
   16  V Atwood, Robert B.
    1  V Atwood, Robert B.--Interviews.
    3  V Atwood, Robert Bruce.
    1  V Atwood, Robert Bruce, b. 1907.
    1  V Atwood, Robert, Mrs.
    1  t Mrs. Robert Atwood.
    1  t Robert Atwood: "It was a pretty busy time... the opportunities were
         everywhere."
    1  t Robert B. Atwood
    4  t Robert Bruce Atwood.


ALL   KEYWORD "atwood robert"                                          - End -
F1-Help F2-Return   F3-Select Rec F4-Select Page F5-Brief Recs PgUp PgDn Home
                                                 F10-Print       ESC-New Search
```

Fig. 5

Summary

The "Ancestors" files in *Polarpac3* and the references being added for *Polarpac4* will lead researchers to over120 000 citations that provide information about early Alaskan residents and citizens of neighbouring Canadian communities. These sources are readily identified in *PolarPac* by simply typing the name and letting the computer do the searching.

It is hoped that further funding will be received. This will allow the "Ancestors" files in *PolarPac* to grow and become an ever more valuable resource for locating those illustrative and illusive individuals who settled in Alaska and northwest Canada.

Polarpac4 is scheduled to be released in late 1995.

Libraries may purchase a copy of *Polarpac3* on CD-ROM, by placing an order with WLN, P.O. Box 3888, Lacey, WA 98503-0888 USA. The cost is $295.00 per set.

employed at the same mines from Nov. 24, 1917, to March 15, 1918. A dependent mother, living in Norway, was left as a result of his death.

March 27—W. E. EGAN, contractor for the Valdez Gold Company, operating the old Cameron and Johnson property near Shoup Glacier in the Valdez District, was killed by being caught in a snowslide, preparatory to commencing work on his contract, the scene of which was to be the main working tunnel on the property, the elevation of which is about 3000 feet above sea level. Egan and his men were attempting to clear the tram cable which had become fouled in the deep snow. While they were making this attempt a snowslide occurred in which Egan was buried and lost his life. One dependent, his wife, was left as a result of the accident.

April 10—GUSTAF VIAENE, Belgian, age 41 years, engaged by the Chichagoff Mining Company as topman at the main working shaft of their mine on Chichagof Island was instantly killed by falling down the shaft a distance of 300 feet. As topman, Viaene's duties were to load the skip with timber and other supplies destined for use on the lower levels of the mine, to give signals for the lowering of the skip from the main level, to see that the guard rails at the top of the shaft were properly set and in other ways to see that the top station of the shaft was kept in proper condition. He had been employed as topman for a period of about eight months preceding the accident by which he was killed. A considerable supply of mine timbers were kept in the shaft station piled a number of feet from the collar. Just prior to the accident Viaene had loaded the skip with some of these timbers and had sent them to the 300 station. Although there were no witnesses to the accident, an examination of the surroundings following its occurrence indicated that after sending the load to the 300 level Viaene had returned to the pile of mine timbers and with his picaroon was engaged in getting ready a second load. He probably was standing with his back to the open shaft, as he had left the guard rail up, and with his picaroon was pulling a timber toward the shaft. The picaroon must have slipped, causing him to fall backwards into the shaft. His body together with the picaroon was found at the 300 station on top of the load of timbers he had sent to that level. Evidently Viaene's failure to place the guard rail in its proper position after sending the load of timbers to the 300 level was largely responsible for his death. No dependents were left.

May 15—MATT SLUJO, Austrian, age 35 years, married, engaged in the capacity of contractor by the Alaska United Gold Mining Company at their Ready Bullion Mine at Treadwell, received an injury at 1 P. M. on the date above named as the result of which he died in the hospital shortly afterward. It appears that, at the time of the accident, Slujo was attempting to dump a carload of rock. He

Fig. 6

ST JOSEPH'S HOSPITAL, Conducted by the Sisters of Charity, under the Management of the Catholic Church (See p 70)
ST MATTHEW'S EPISCOPAL CHURCH, Rev Charles E Betticher Jr, Rector, ss 1st Av 3 e Bonnifield
ST MATTHEW'S FREE PUBLIC READING ROOM, 1st Av se cor Bonnifield
ST MATTHEW'S HOSPITAL, Miss Isabel Emberley Supt, 1st Av ne cor Bonnifield (See adv)
St Pierre Adolph, miner, h w of brewery
Sale John L, jeweler 68 Cushman, h 118 Cowles
Saline Arthur, miner, r ss 6th av 2 e Wickersham
Sampson Ida K (Jessen & Sampson), h ss 4th av bet Noble and Wendel av
Sanderlin E, setter Tanana Mill Co
Sanders Charles, cook, r ss 6th av bet Kellum and Bonnifield
Sanders P, miner, r Pioneer Hotel
Sands Charles, baker G A Johnson
Sanford Warren W, capt str Koyukuk, r Wm Branch
Santhuff Otway E, cook, h ss 7th av bet Turner and Barnette
Sargent Charles S (Sargent & Pinska)

Sargent & Pinska (Charles S Sargent, Martin B Pinska), men's furngs 210 1st av
Sather Lena, laundress, h 142 8th av
Saul James H, bkpr Vachon's, r 123 1st av
Saur Ephraim, lab, r ss 12th av 4 e Cushman
Savage Lyman A, furs ws Duenkel bet Wendal av and Waterfront, h same
Savage Walter, mining Fairbanks Creek, r 252 1st av
SCALES H HUNTER, Cashier P C S Co, h 167 2d Av
Schade John (Waechter Bros & Schade), r 2d av cor Wickersham
Schansel Conrad, butcher H E Gardner
Scharle John (Scharle & Sale), r Graehl
Scharle & Sale (John Scharle, John Sale), market gardeners Graehl
Schaupp Carl, miner, r 123 8th av
Schaupp Fred, sheet metal works 1st av se cor Lacey, r 123 8th av
Schlagal Fred, emp C H Heine, r Garden Island
Schlapik Hyman, tailor 110 Cushman, r same
Schloss Henry, mining, r 5th av nr Cowles
Schmitz Anton G, mining Ester Creek, h 346 1st av
Schmitz Peter, waiter Capewell & Phinn
Schnabel Wm S, guard U S jail, h ss 5th av bet Hall and Clay
Schneider —, painter, r ss 5th av 4 w Barnette
Schneider Frank, cook T V R R Co, res Chena
Schooling Luther B, whsmn Fairbanks Banking Co, r 3d av ne cor Turner
Schroder Henry (Moe & Schroder), h 1st av
Schroeder Mat, carp, h 9th av and Barnette

Fig. 7

Archival data and the assessment of polar climatic change

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Abstract: Selected examples of the use of various older records are given to extend and improve modern analysis of climatic changes. These particularly concentrate on both polar regions. Indications of what might be useful for future investigation are given. A synopsis of data from ships which wintered in the Canadian Arctix during the last century is indicated.

Keywords: Polar regions, climate changes, archives

Introduction

The worst case speculations of the results of supposed global warming have gained much public attention during the past decade, which may be expected to continue for several more years (depending on the dissemination of results of research). Adopting a cautious approach to those environmental problems which are heavily publicised, I consider it is more accurate to speak of 'climatic change' rather than the notorious 'global warming'. Historical records clearly indicate that climates have always been changing, with temperatures, precipitation, winds, and all other meteorological phenomena varying in different regions, at different times, in different seasons, and at different rates. Those of you experiencing the present local climate might recall this region was regarded, during the Roman period, as good grape-growing country and remained substantially warmer during the several later centuries when agriculture prospered in Greenland.

To analyze and predict future trends of such complicated phenomena it is essential to secure as much data as are practicable from as many independent sources as may be available. This is fundamental to improving the reliability of any predictions, especially with such diverse origins for these data.

Current climate data collection

Before discussing the archival aspects let me give a few examples of other sources for climatic records with which they might be correlated. The computers of the Meteorological Office and the European Forecasting Centre at Bracknell, and of those in similar establishments elsewhere, have vast amounts of recent standardised information for most of the world which is being received and analysed constantly for weather forecasts.

Many phenomena may also be used as a basis for much older measuremnts of climate. Dendrochronology has provided some useful details of the conditions experienced by particular plants in specific regions with an emphasis on conditions of biological consequence. Records from such sources overlap sufficiently for many thousands of years to be interpreted with satisfactory reliability, but they are of comparatively little use for polar regions owing to types of vegetation there. Analysis of ice cores is another method of determining change in atmospheric gases and determining its temperature at a great range of ages. Similar considerations apply to assessment of glacier advance and retreat - several classical Swiss illustrations have been unexpectedly useful here. Coring of peat deposits, and of lacustrine and marine sediments, similarly yield useful data on past climates in periods from decades to millennia. These examples are but a few of the many methods in use for collecting climatic data, for varying periods of time. The advantage of the diversity is that correlation of different methods allows mutual confirmation and thus increases reliability. In polar regions several hypotheses of cataclysmic change, such as instability of the Lesser Antarctic icesheet, behaviour of surging glaciers, methane release from hydrates in permafrost, etc. are related subjects of research.

Archival records

Climatic research concerns all regions of the planet but the Arctic and Antarctic are particularly sensitive to variation in climate. This is unfortunate as there have always been comparatively few inhabitants in polar regions educated to record such information, and observatories were rare or, before the first International Polar Year (1882-83), virtually non-existent. Only a small proportion of the present ones have continuous records preceding the time of the International Geophysical Year (1957-58). One of the consequences of the scarcity of any polar meteorological data is the degree of ingenuity required in seeking what is available. It is this I propose to discuss and will give a selection of examples, to some extent based on the Scott Polar Research Institute archival collections. Examples

SOURCES OF METEOROLOGICAL DATA FROM WINTERING EXPEDITIONS, CANADIAN HIGH ARCTIC, 1819-1859

(Available in the Scott Polar Research Institute except where stated)

TEMPERATURE DATA

YEAR	SHIP	CAPTAIN	LOCATION	COORDINATES	SOURCES	DATA
1819-20	*Hecla*	Parry	Winter Harbour	74°40N 111°W	Parry, Fisher	1
1821-22	*Fury*	Parry	Winter Island	66°00N 82°30W	Parry	1
1822-23	*Fury*	Parry	Igloolik	69°20N 82°W	Parry	1
1824-25	*Hecla*	Parry	Port Bowen	73°20N 88°W	Parry	1a,1
1829-30	*Victory*	J. Ross	Felix Harbour	69°30N 92°30W	Ross	1b
1830-31	*Victory*	J. Ross	Felix Harbour	69°30N 92°30W	Ross	1b
1831-32	*Victory*	J. Ross	Felix Harbour	69°30N 92°30W	Ross	1b
1848-49	*Investigator*	J.C. Ross	Port Leopold	74°00N 90°20W	Strachan*	2,3
1850-51	*Sophia*	Penny	Assistance Bay	74°30N 91°W	Strachan**Su'land	2a,3
1850-51	*Assistance*	Ommanney	Griffith Island	73°40N 95°30W	Strachan**	
1850-51	*Investigator*	M'Clure	Prince Royal Is	72°45N 117°30E	Armstrong	4
1850-51	*Advance (U.S.)*	De Haven	We Ch, B St	Adrift	Kane	3
1851-52	*Investigator*	M'Clure	Mercy Bay		Armstrong	4
1851-52	*Prince Albert*	Kennedy	Batty Harbour	73°10N 92°W	Kennedy	2b
1851-52	*Enterprise*	Collinson	Winter Cove	72°N 118°W	Strachan**	
1852-53	*Enterprise*	Collinson	Cambridge Bay	69°N 105°W	Strachan**	
1852-53	*Investigator*	M'Clure	Mercy Bay		Armstrong	4
1852-53	*Resolute*	Kellett	Dealy Island	75°N 107°50W	Strachan*, McD	2,3;1
1852-53	*Intrepid*		Dealy Island	75°N 107°50W	Strachan*	2,3
1852-53	*Assistance*	Belcher	N'umberland Snd	76°40N 96°W	Belcher	1
1852-53	*North Star*	Pullen	Beechey Island	74°40N 92°W	Strachan*	2c,3
1853-54	*North Star*	Pullen	Beechey Island	74°40N 92°W	Strachan*	2c,3
1853-54	*Resolute*	Kellett	Cape Cockburn	74°55N 100°10W	Strachan*;McD	2,3;1
1853-54	*Intrepid*		Cape Cockburn	74°55N 100°10W	Strachan*	2,3
1853-54	*Assistance*	Belcher	Wellington Ch		Belcher	1
1853-54	*Enterprise*	Collinson	Camden Bay	70°N 145°W	Strachan**	
1857-58	*Fox*	McClintock	Baffin Bay	Adrift	Schott	2,3
1858-59	*Fox*	McClintock	Port Kennedy	72°30N 94°W	Schott	2,3

1 = Daily max, min and mean
1a= Daily max, min and mean (based on obs every 2 hours)
1b= hourly
2 = 2-hourly
2a= 3-hourly
2b= 6-hourly
3 = Daily mean
4 = Monthly mean
* Held at SPRI
** Held at Met. Office, Bracknell

Table I. Sources of meteorological data from wintering expeditions, Canadian High Arctic, 1819-1859

of unpublished documents from which useful climatic data have been extracted are Admiralty and other meteorological registers, log books, sketch maps, some paintings and drawings, various voyage accounts, whaling and sealing reports, photographic plates, and a variety of other items. More data may be derived from these, and similar, sources.

Naval records

Admiralty records of meteorological and related phenomena (astronomical, geophysical, and others) have been highly standardised for about two centuries. In an account written in 1854, Henry Raper commented that '... the keeping of the log or journal, in the royal navy or the merchant service, is a matter strictly professional, and no one would be entrusted with it whose experience did not qualify him to know what matters to insert and how to express them, ...'. It was in 1795 that the Hydrographic Department of the Admiralty was established in London. The United States Navy similarly established its Depot of Charts and Instruments in 1830 (which became the Hydrographic Office in 1866 and Naval Oceanic Office in 1963). Other countries had similar establishments but only a few of these had significant interest in polar regions. The majority of capital ships included meteorological observations of some form in their logs with particular attention being given to wind - their motive power.

Polar data were a minority in these but an interesting series of historical coincidences made some Arctic observations particularly useful. The end of the Napoleonic Wars left the Royal Navy with a very large fleet and, to provide useful work for it exploration of the North West Passage was undertaken. Efforts began early in the 19th century and charting was progressive from both ends of the Passage. Many of the difficulties were with the weather and ice conditions; the difference between a good and a severe winter was enormous (as Arctic whalers had previously established). A consequence of this was the enforced wintering of many vessels aboard which detailed meteorological observations were maintained. The fate of Sir John Franklin's 1845 expedition still dominates the history of this period of exploration of the North American Arctic. There is an irony in the fact that by getting lost he was responsible for a vast improvement of the charts resulting from the activities of many search expeditions which operated for 15 years. Many of the vessels involved were forced to winter, and some did so intentionally.

The practical aspect of this is that manuscript meteorological records from 28 winters, between 1819-20 and 1858-59, are available from the Canadian Arctic archipelagos. There are a few complications with these but many useful analyses may be made.

Quality of records was generally to high naval standards although the occasional reading is suspect (some maxima may make one think an observer picked up the thermometer by its bulb). One unforeseen problem with this is the sea-water temperatures which were normally made by taking a sample in a small cylindrical bucket and immersing a thermometer in it for several minutes on the exposed deck. The material of the bucket has been found to be important; it may have been canvas, leather, wood, or metal, all of which sustain differing rates of cooling, but, regrettably, few records give details of the material from which particular buckets were made. (I note this as a cautionary example when using such data)

The archives of the Institute, with assistance from those of the Meteorological Office, have allowed the extraction of this data to improve the analysis of the Arctic climate during the last century. Fig. 1 shows the locations of most of the vessels concerned. It is interesting to note that data recorded in an Admiralty register by a quill pen in ink have been entered directly into the University's computer and proven useful about a century and a half after they were collected. Sufficient data are available for certain correlations to be made and the figures in the example prepared by Julian Dowdeswell (Fig. 2), show close correlation of data recorded aboard different vessels. When such an opportunity occurs, it is a valuable cross-check on accuracy which, in this instance, is evidently high.

Other analyses of manuscript information from log books are also practicable, although rarely with the conciseness of Admiralty registers. The position and penetrability of sea ice at different dates in different years are particularly useful pieces of information as well as details of the movements, behaviour, and release (where this occurred) of ships which became beset.

Sea ice

Whalers and sealers operated extensively in the Arctic and Southern Oceans and there were many more of their vessels there than any exploratory ones. The habits of many of their quarry, especially as they became scarce, took vessels close to the ice edge on a regular annual basis. Such records have demonstrated the influence of the 'little ice age' in certain Arctic regions. In particular this has been investigated in great detail for the waters around Iceland but much similar work is possible else where, particularly in the Southern Ocean. There is one warning which should be given; one must bear in mind the change from the Julian to the Gregorian Calendar as the former one was significantly behind the latter. [The Gregorian Calendar was adopted in most Roman Catholic states of Europe in 1582 (4 October followed by 15 October). Other states followed on different dates, e.g. Scotland 1600; Netherlands 1700; England and the British colonies 1752; Soviet Union 1918.]

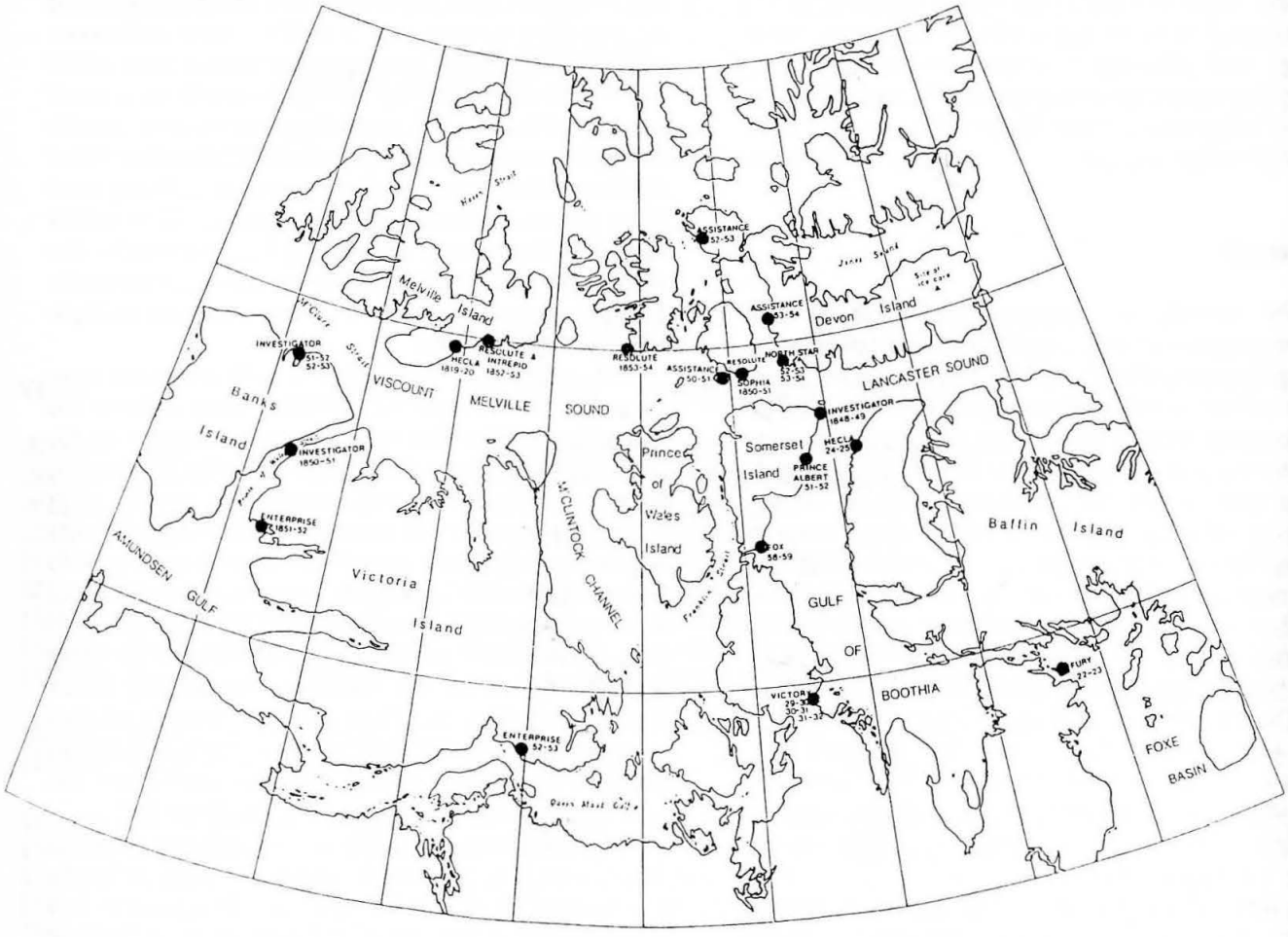

Fig. 1. Location of vessels involved in collecting meteorological data during the 19th century

As well as literature, various images may be useful for determinations of forms of sea ice and, to a lesser degree, other phenomena. Although photographic images are always better than sketches for this purpose the oldest from the Arctic date from only 1867 and the first good set is 1875-76 (Sir George Nares expedition). Such views may provide details at a particular place and for a definite date, of ice cover, surface form, its age, presence and direction of pressure effects, and other phenomena. Sketching was, and still is to some extent, an important part of the work of navigators and surveyors, thus the reliability of such unpublished works was high. Thus it is often a usable source but published versions of sketches are occasionally less reliable, as some engravers were accustomed to apply some artistic licence to sharpen mountains, put vessels in greater peril in more severe ice, or apply similar embellishments.

Two contrasting Antarctic examples illustrate sea ice measurements. The drift of the sea ice in the Bellingshausen Sea has been measured only twice; the log of *Belgica* which drifted there during 1898 provided one set of data, while the other is from a buoy released into the drift by Scott Polar Research Institute in 1992. The second example, presently uninvestigated but with considerable possibilities, is from the records of the South Georgia Magistrate and the Grytviken whaling company which are held at the Institute and cover periods from 1904 to 1966 and 1909 to 1973 respectively. These include catch statistics for whales, meteorology from a maximum of seven stations at one time, whaling reports, movement of vessels, logs of local ships, with many other comments by men experienced in ice navigation and other polar operations. From these the nature of packice can be established fairly effectively for most of the whaling season and to some extent for winter. This can be correlated with meteorological and ice records from the South Orkney Islands which began in 1903, as well as with the few, briefer, records from other Antarctic stations.

Whalers and sealers

The whalers were nearly all Norwegian and some spent some of their time travelling about parts of the highly glaciated island. Photography was (and is) a popular

hobby there and many whalers later deposited photographic albums in the Hvalfangstmuseum in Sandefjord, Norway and elsewhere. These are accessible and many have views of the glaciers, often with quite recognizable rocks or other distinctive features which allow measurements to be made. Similar photographs are held in Cambridge and some other repositories. Not much investigation of these has yet been done, but indications of glacial positions at the beginning of the century, a notable advance up to the late 1920s and a general retreat as the weather subsequently became warmer, wetter, and windier, are found. This is in accord with the meteorological data and some glaciological evidence from annual ridges where these persist.

The extensive compilations of whalers' and sealers' log books made in the archives of many New England whaling museums are another potential source for data. The holdings have been extensively catalogued and used to extract information on numbers and movements of many species of whale. As demonstrated in the paper delivered to the previous colloquy, they are also an excellent source for an 'Antarctic Chronology'. Ice conditions on the Southern Ocean, some meteorological details, accessibility of fjords and anchorages of many peri-Antarctic islands, and related data may be extracted from these records. Thus an operation similar to that of the extraction of whaling statistics may be another source for Antarctic climatic data from the previous century.

Maps

Retreat and advance of glaciers is one of the better developed methods of assessing earlier climatic states of particular and local circumstances. Many polar expeditions prepared careful manuscript topographical maps with positions of glaciers indicated. Often these were amalgamated into larger sheets for publication with the expedition's scientific results but, for local regions such as the limits of a plane-table survey, the originals are available and many distinctive features may still be discerned at the sites. In some a carved datum point was left or another identifiable marker remains.

Summary

This selection of examples of manuscript, charts, sketches, paintings, drawings, and photographs indicates an application of archival data quite unanticipated by those who originated it. As well as its intrinsic value there is an important extrinsic aspect for it provides calibration and confirmation of records from physical, biological and several other sources. Reliability of climatic research can be greatly increased by records of direct observation of conditions - regardless of the intentions of the contemporary observer. Analytical problems are, of course, always present; I have indicated a few above. I emphasise I have given but a selection of examples and many more might be used; records of the old trading companies, of missionary outposts and other settlements are also available and may contribute usable data.

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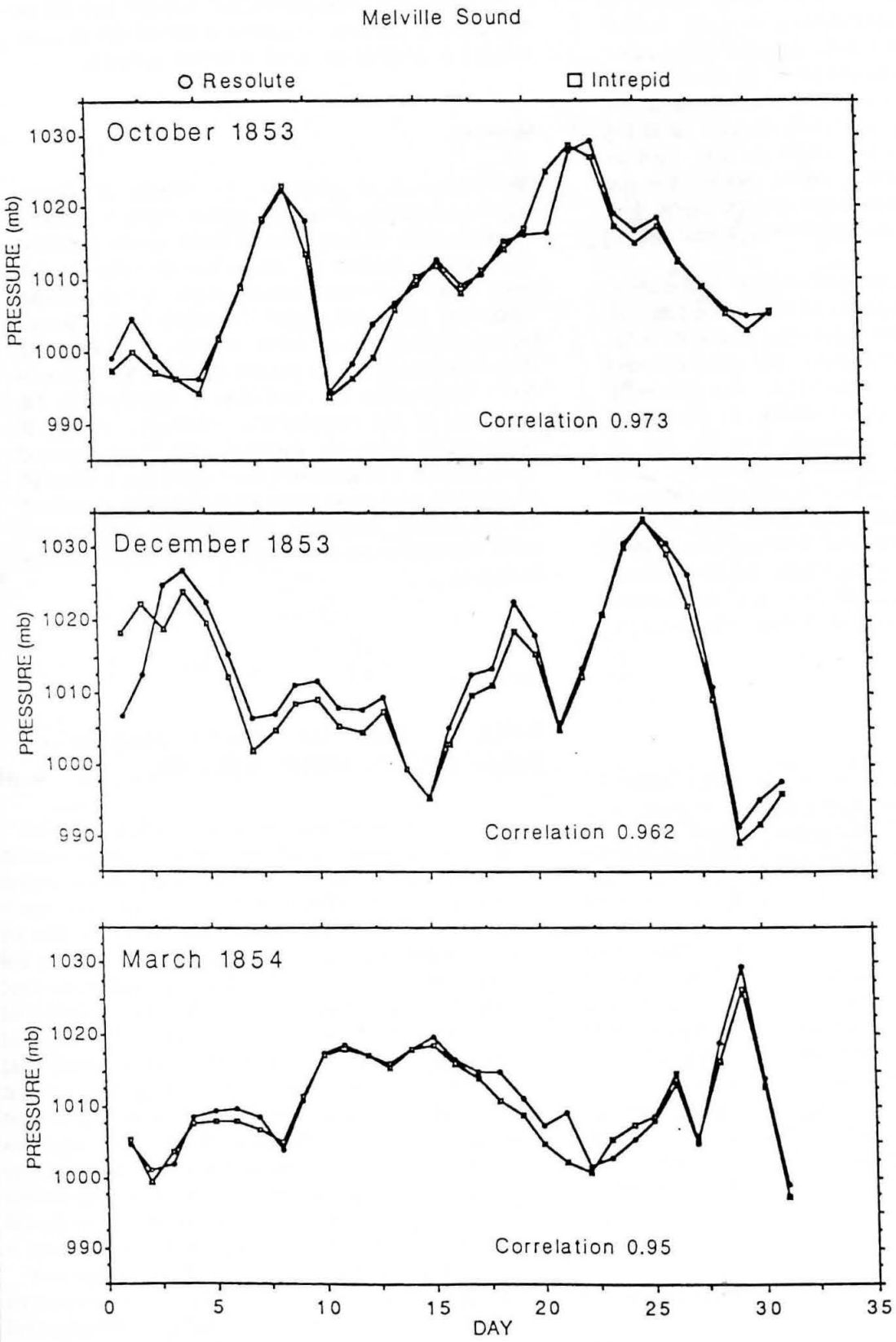
Fig. 2. Comparison of *Resolute* and *Intrepid* average daily pressure



Supply and demand equilibrium: the marketing of polar information

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Abstract: National, special and local libraries in Moscow possess collections on subjects related to the polar regions and adjacent area. The development of new means of information transfer and marketing are described and put into national and regional contexts.

Key words: information, marketing, polar, database

Introduction

In the development of all science, including ecology, it is now necessary to consider the economic, institutional, managerial and legal problems and possibilities. New options, for instance, specialized subdivisions, separate from research institutes, set up as small commercial bodies for science and industry. These may enter the information market with highly competitive products. This information market, a synthesis of the available resources of science, can and should, provide the essential bridge between the producers (scientists) and the consumers (industry, government, public). The recommendation of the 2nd International Congress "Small and medium business in Russia" (Moscow, June 1993) underlined the commercial potential of information resources and the need to support ecological information projects. It was agreed that the International Agency of Innovation and Ecological Projects should be set up.

Legal and structural background

Environmental issues are included in the terms of reference of various departments and bodies. The federal law "On protection of the environment" (19 December 1991) defines the competence of the Government, designated bodies, the republics and the local authorities in the management of information resources.

On 22 September 1993 the Act "On the executive agencies empowered in environmental protection in the Russian Federation" was adopted. It specifies the functions of the federal body - the Ministry of Protection of the Environment and Natural Resources - as well as the territorial units for the ecological and resource management activities. The Act "On the establishment of the national system of monitoring" (approved by the Government in November 1993) charges the federal Ministry with supervising the establishment of the system.

Finally, on 23 April 1994, the Government passed the Regulations of the Ministry of Protection of the Environment and Natural Resources. According to them the Ministry provides for the establishment and management of ecological information systems and organizes the activities concerned with gathering, handling, and disseminating the information on environmental protection.

Output of the investigations

At present more than 30 federal programmes on environmental protection are being pursued, most at the regional and inter-regional level. For instance, the integrated territorial inventories of natural resources are held in the regions under the programme "Inventories of natural resources". The programme "Ecology of Russia" covers the theoretical and practical sides of standard procedures, legislation, economy, information and management in nature usage. Economic regulation (taxes, subsidies, credits and ecological insurance) and the market tools of self-regulation (privatisation policy and ecological services) have also been studied.

In ecological marketingthe quality of a product must meet the ecological requirements and be reasonable in price. Usually the information availability is advertised at the scientific exhibitions, workshops, conferences and in the mass media. In future the Centre of Ecological Marketing will carry out the exchange of new ecological technologies and data. Ecological funds also contribute to the research. Alongside with the Federal Ecological Fund and other foundations a Joint Stock National Bank of environmental protection "Econatsbank" has been established.

Marketing information resources

Investigation

The components of the information market (ie. the product, the demands, the market environment, the

forms and channels of sale, the market segmentation) have been studied. Specifically, the scheme of marketing study followed the stages:

1. Assessment of the actual market demand in ecological information, its consumer features, positive and negative demand, users' requirements
2. Users' demands: geographical, demographic, social and psycological factors
3. Market environment: the variety of products, main characteristics of products, market strategy, sales practice and price policy
4. Forms and methods of sales system
5. Market segmentation, the peculiarities of users groups

Classification

Bearing in mind that there are two types of ecological data (commercial and non-commercial), the theory, practice and marketing should be interconnected. The dynamics of the market would correlate with the investigations thus finding the balance between the three functions of any organisation.

The classification of ecological information can be done in different ways. Shekhurin D.E. uses the following types: all the special literature; patent, licence and invention documentation; scientific, managerial, commercial and methodological documentation; products of information services; reference information. Molchanova *et al* however, only use three large groups: business (stock and financial), special and popular information. The Guidelines in research on biological diversity (UNEP 1992) subdivide the information resources into: computer data bases, data of distance testing, collections of literature (published and grey), bibliographies, data networks, personal archives, notebooks, catalogues, etc.

Effective interaction needs a system of registration of participants and monitoring of information resources. Currently about 600 information bodies participate in the market; 100 of them are state and 250 are commercial. The latter generate databases online. The number of databases has increased from 1200 up to 2700. At present the obligatory registration of databases and licensing of information activities are being considered.

Needs and demands

The emergence and development of needs as perceived by the market are characterized by a number of conditions. Interestingly interdisciplinary links appear to be the main one that influences the content of the need. To be effective it is necessary for the market to understand the activities and information requirements of its users. Thus data on motivation, means and trends of development as well as personal information about individual users (education, skills, professional interest and intentions) are key components in the development of information transfer.

International efforts

In 1991 the Ministers of Arctic countries including Canada, Denmark, Finland, Greenland, Iceland, Norway, Russia, Sweden and USA signed the Declaration on Environment and Development in the Arctic. The Arctic Environmental Protection Strategy is composed of four programmes, each of them requires multilateral cooperation on the specific problems: the Conservation of Arctic Flora and Fauna (CAFF), the Arctic Monitoring and Assessment Programme (AMAP), Emergency Prevention, Preparedness and Response (EPPR) and Protection of the Arctic Marine Environment (PAME). It seems expedient in the future to consider the information and bibliographic issues through the above international body.

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Information and library support of basic research in the Far East branch of the Russian Academy of Sciences

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Abstract: The paper describes and discusses the following main topics:

1. Short description of the history, main tasks of the Far East Branch (FEB) of Russian Academy of Sciences (RAS).
2. Specific feature (vast distances, 3-4 hours flights between institutes, unique research objectives and etc.) of FEB and the reasons for the urgent need for special information service and library support for basic research.
3. All Russian Institute of Scientific and Technical Information (VINITI) products and information service for FEB of RAS.
4. The activity of the Central Scientific Library (CSL) situated in Vladivostok.
5. Cooperation between U.S. Geological Survey and VINITI's FEB department in producing the database on Lake Baikal literature.

Key words: Far East region of Russia, information service, library, basic research, database, USA-Russia cooperation

Far East Branch of Russian Academy of Sciences

The Far East Research Centre (FERC) was organised on October 1, 1970 in Vladivostok by combining a number of scientific institutes of the Siberian Branch of the Academy of Sciences: Far East Geological Institute, the Pacific Oceanographic Institute, the Soil Biology Institute, the Institute for Biologically Active Substances, the Institute of Marine Biology, the Institute of Biological Problems of the North, the Khabarovsk Integrated Institute, the Sakhalin Integrated Institute, the Magadan Integrated Institute and the Institute of Volcanology in Petropavlovsk-Kamchatsky. The establishment of FERC and its development in the subsequent years have produced a branched network of institutes.

In October 1987, soon after Gorbachev's visit, the Vladivostok FERC was transformed into the FEB of the USSR Academy of Sciences. One of the main tasks of FEB is to strengthen the integration of scientific results with economic production and hasten the development of the regional economy. Today FEB is an outstanding research complex of 34 scientific institutions in Vladivostok, Magadan, Khabaravsk, Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky and Blagoveshchensk on the Amur River. Of the 8656 employees, 12 are academicians, 24 correspondent members, 209 professors, and more than 2500 are Doctors of Science. There are permanent field camps in different locations (including four in Magadan and Chukotka area) and a unique marine reservation in the Vladivostok district. The FEB has 21 ships filled with the latest scientific and navigation equipment designed to carry out sophisticated programmes of marine investigation.

The basic research being carried out covers a broad range of problems, from physico-chemical biology and biotechnology to the study of adaptive strategies of organisms and populations in basic research in the northern conditions of Europe and Asia; basic research in geology and natural resources and development of methods and software for automatic processing of data from remote sensing facilities such as temperature fields in the ocean. During last year the FEB scientists have published 97 books, 130 pamphlets, 1529 articles in Russian and 530 in foreign journals.

The Far East with is vast spaces, unique research objectives and interdisciplinary projects is in more difficult position than any other region of the countryt in terms of providing scientists with scientific information.

First, there are problems simply caused by the geographical distribution of FEB institutions over the vast territory. The flight from Moscow to Vladivostok is now 10 hours by jet, and it takes four to six hours to fly between some cities in the FE. The remoteness from large libraries makes many of the information services that function well in Moscow and Leningrad quite ineffective in the FE. S

econd, the diverse subject areas covered by FE institutes, and the interdisciplinary nature and novelty of many problems creates a much greater need for scientific literature in biology, chemistry, geology, geography, environmental science etc. which cannot be serviced by the hard currency appropriations assigned to the FEB.

Third, young people who make up a large part of the scientific personnel, are gaining insufficient experience with scientific literature.

VINITI

To facilitate FE scientists' access to up-to-date scientific literature, a special decision was taken in 1972 by the President of FERC Prof. A. Kapitsa to organise in Moscow a department for special information services to FE scientists using the of All Union Institute of Scientific and Technical Information (VINITI).

VINITI was organised in 1952 under the control of the Academy of Sciences and is still the central institute for scientific and technical information. VINITI is a well-known information service which produces and publishes 26 Journal Abstracts (JA) in all fields of natural and applied sciences. The 26 JA consist of 148 issues which can be subscribed to separately. The JA are published every month (excluding JA on Chemistry which is published bi-monthly) and contain every year about 1 million abstracts from different sources - journals, books, pamphlets, patents, deposited papers, etc. Until 1992 VINITI received about 14 000 foreign journals and all kinds of publication which were published in Former Soviet Union (FSU). At that time about 25% of abstracts were of science and technology in FSU.

From 1980 VINITI has produced and maintained the database (DB) and set up on-line service for the users in FSU. Although online files contain about 11 million abstracts, VINITI has old computer resources and only 20 Mb of file can be searched online at a time. Unfortunately, the database format cannot be transformed to ASCII - a very important limitation for information transfer. As everyone knows, since 1992 the economic constraints have changed the situation for information services and libraries drastically. The number of foreign journals which were covered by JA has decreased to one tenth of the original number. About 50% of the present abstracts reflect the literature which was published in Russian. One of future goals of VINITI is to produce the database on CD which would cover all the scientific literature published in Russian.

VINITI is responsible for the special information service for full and correspondent member of RAS and for FEB. There are 12 people working at the FEB department; ten of them are scientists in various fields of science and with a high level of knowledge of English and there are two technicians. Two kinds of information service are provided: selective dissemination of information (SDI) for the users selected by the scientific councils on biology, computer science, biotechnology, earth and environmental sciences, and requests for scientific literature using the interlibrary loan system. There are 150 individual and 15 users group who have access to the SDI service. A number of documents are used in our work:

1. a list of users with individual characteristics and indication of their subject matter
2. a card file of keywords of SDI users
3. a card file of latin names for biologists
4. a catalogue of the current journals and on-going publications (about 1500)
5. a user feedback file

The interlibrary loan system does not work efficiently for the Far East. The mail system is not reliable and the main libraries in Moscow and St. Petersburg have never wanted to send books to FE. The Department provides a centralised response to requests for scientific literature by photocopy. We also supply the Central Library in Vladivostok with a bibliographic catalogue of photocopies. The experience of working with leading specialists has shown that current issues of Current Contents, SCI and Chemical Abstracts are the main sources of information about foreign books ordered by our users.

The Central Scientific Library (CSL) of FEB was established in 1930 and until 1941 had good cooperation with foreign libraries. Unfortunately, the government policy before 1991 then forbade all kinds of cooperation. The CSL has a collection of about 800 000 volumes including more that 350 000 volumes of foreign books and journals The library receives all kinds of publications published in FE and is responsible for serving scientists of FEB as well as people working at the University. The library has nine divisions in the institutes in Vladivostok and Ussuriysk observatory and has very close cooperation with the libraries of FEB institutes outside of Valdivostok's region.

International co-operation

The FEB scientists communicate and cooperate in research with their foreign colleagues mainly in biochemistry, immunology, environmental and earth science problems. Within the framework of USSR-USA cooperation an agreement between the US Geological Survey and the FEB was signed. In 1990 USGS initiated a five year multidisciplinary study called "Global climate change". Lake Baikal situated in south-eastern Siberia is also the oldest lake system in the world. The sediments within the Lake Baikal depression are estimated to be over 5 km thick and 30 million years old. The Lake has not been glaciated and therefore its sediments contain the longest and potentially most complete records of how central Asia has responded to global climate change.

To facilitate access by American scientists to results of studies done in Russia a decision was taken to produce the Lake Baikal database. The database gives electronic access to multi-disciplinary scientific publications and analytical data pertinent to the Baikal area and published in Russia. The file consists of 4000 references from published sources 1769 to 1969. The database covers a variety of fields: geology, geochemistry, geotechnics, minerals and oil,

meteorology, climatology, hydrology and ecology. Russian bibliographic information was entered in transliterated Russian as well as in English. Temporal analysis shows 30 articles published from 1700-1799; 223 references published from 1800-1899; 600 references published from 1900-1939; more than 700 references published from 1940-1959 and more than 2000 references published from 1960-1969.

Acknowledgements

The author would like to express her gratitude to the International Science Foundation, J. Brown (USA) and W. Mills (UK) who helped me to have the marvellous opportunity to participate in the Colloquy.

Grey literature as a main source of information about modern Russian knowledge on the Arctic Region development

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Abstract: The transformation of the economic system in Russia has changed the structure of information flow on Arctic problems. The cancellation of censorship has produced many articles in the mass media but the availability of modern scientific information is now even more restricted than previously. The national periodicals devote less than 15% to articles on the problems of natural resources utilization in the Barents Region, 5-10% to papers on Arctic ecological problems and only 2% to socio-economic or cultural problems of the North. The data in major journals or books from the central printing-houses are rather old by the time they are published. The newest data and techniques are to be found in the departmental or local editions, which could be classified as a grey literature. The Kola Science Centre Library (KSCL) and the Murmansk Regional Scientific Library are updating the Annual Citation Index on the Murmansk Region (Russian version) and a downward trend is appearing: of 3151 in 1988 down to 2216 in 1991. The KSCL also maintains "*The Kola Bibliography*" which covers up to 95% of scientific publications on the Euro-Arctic region.

Key words: Kola Bibliography, Euro-Arctic region, Murmansk region, grey literature, Russian North, Kola Science centre

Introduction

Scientific libraries in the Euro-Arctic region of Russia did not have any serious problems in providing users with modern national literature before the disintegration of the USSR. They used their own resources as well as books of the largest national libraries through a mail based book-exchange system. The main sources of new data for researchers were national and international journals and books issued by central publishing-houses. Recently the situation has changed dramatically and a "grey literature" is now considered to be the key supplier of current knowledge in the Russian North. The experience of the Scientific Library of the Kola Science Centre is described to illustrate some of the effects caused by this transformation of the structure of information flow. The KSC Library is located above the Arctic Circle in Apatity City. That is one of the oldest (since 1930) and one of the largest (more than 500 000 items) polar scientific libraries.

Economic crisis in Russia and its consequences for polar libraries.

The consequences for the national library system of economic and political transformations in Russia have been threefold: - scientific book-publishing has fallen into decline; - the conventional system of supplying libraries with books as well as the inter-libraries exchange network have failed; - the funds for polar libraries have declined significantly.

"The Great Depression" in the economy of Russia during the last three years has produced as a collapse of Russian scientific book-publishing. It never was a profitable business but in the USSR the heavy expenses were covered by allowing state subsidies to support a high level of publishing activity. Under transition from a planned economy to a market economy these "scheduled" subsidies have been sharply reduced or cancelled, and the majority of publishing-houses now print detective or erotic novels instead of scientific books as only popular literature brings a monetary profit.

Charges for the publication of research results by the central publishing houses sometimes exceed the costs of the research itself. In 1994 the Kola Science Centre could no longer afford the services of the national publishing house "Nauka". All KSC transactions now must be issued by their own small Publishing Department which can only produce 200-250 copies of each item. It should be emphasized that such small editions have become standard even for the largest Russian publishing-houses because impoverished institutes cannot pay for longer print runs. Thus, the first consequence of the economic depression in Russia is a rapid growth in the "grey literature" component of the general scientific information flow.

This conclusion can be illustrated by comparing data for the last five years on the number of national journals and newsletters, entered by the KSC Library: 1990 - 875, 1991 - 683, 1992 - 563, 1993 - 320, 1994 - 278 titles.

The circulations of national journals have decreased, but subscription costs have increased dramatically (50 to 300 times).

It is necessary to emphasize one other special feature of the Russian North information field. The increase in mail tariffs by 2000 times has almost killed the interlibrary book-exchange. In the West, as well as Moscow, the loss of this method of exchange for printed information would perhaps have passed largely unnoticed, because the users could be provided with the information by electronic channels. In the Russian North the electronic mail is only just beggining, and the telefax communication via the national telephone network is so unreliable and expensive that polar libraries cannot afford it.

Formation of library funds: the failure of the conventional system of the advanced orders

Before 1991 all publishing-houses produced in advance catalogues of the books, to be published in the following two years. The librarians knew the forthcoming financial budget and had an opportunity to order books according to users' interests. Now the issues of catalogues has been almost eliminated. Thus, in 1991 to order for 1992 the KSC Library used 45 catalogues, in 1992 - 19 catalogues, and in 1993 - only 5.

The number of entries in catalogues has also decreased. Moreover, the editors no longer guarantee the publication of books under the terms announced. Many books actually arrive on the book-market 2-3 years after they were announced. In many cases books are outdated before they appear. Despite the reduced value of this outdated information, prices for delayed editions are kept at a high level.

Instead of the advanced subscription system the libraries are involved now in auctions for printed production. The polar libraries cannot really compete with the wholesale buyers, and so the volume and quality of new contributions to libraries are going down step by step. For example, during the last five years in the KSC Library the total accessions were: in 1989 - 18 000 entries, in 1990 - 14 048, in 1991 - 12 782, in 1992 - 9084, in 1993 only 5662 items.

Effect of "Glasnost" on the structure of information flow in the Arctic

The death of censorship has allowed the publication of previously "secret" information on the condition of the Northern environment and pollution, including the pollution by the military complex. Open discussion around problems of safety, risk of nuclear energy, dumping of radioactive wastes etc. has taken place. A mass of papers with secondary, doubtful or biased information have overfilled the mass media. At the same time, the primary results of research are mainly published in departmental editions with the circulation from 50 to 200 copies. The ratio between original and secondary data in modern Russian information flow is lower than during the USSR epoch.

The positive feature of local editions is the reduction in the time between obtaining information and the publication. This is the main advantage of local issues in comparison with central publishing houses, where the information becomes old because of long periods for editing (up to 1 year for magazines, 2-4 years for books). The last fact considerably diminishes the attractiveness of central publishing houses for the authors working in the Northern peripheral regions of Russia. In the Barents region no more than 15% of publications on natural resources development and utilization, 5-10% of articles on ecology problems, less than 2% of papers on social and economical questions usually appear in the national magazines.

During the last few years symposia have become the most popular form of publication of the KSC researchers' works. Their share of abstracts in the annual bibliography is estimated at 40% of the total number of papers. Unfortunately, this form of publication is optimum only for exchange of ideas, whereas in data supply abstracts play a subordinate role. The symposia are rather a means for advertising of new ideas than a real source of knowledge or experimental data.

About 60% of the Kola scientist papers are now published in Apatity. The issues concentrate the latest primary information, but the availability of information is limited as books are not sold through the book-trade network. They are distributed mostly by subscription. Western information systems do not usually get even the bibliography of these editions.

It is clear that "grey literature" has recently become the most important source of real knowledge and data for the Russian North. The important task for theArctic community are urgent measures to improve the availability of Russian polar literature.

The Kola Bibliography as a pilot in the Euro-Arctic sea of "grey literature"

The KSC Library, in cooperation with the Murmansk Regional Scientific Library, is collecting all publications about the region. This collection is named "The Kola Bibliography" KB. On the basis of KB a two volume citation index "The Kola Peninsula" has been published annually since 1960. The 33 volumes issued contain 78 787 citations for the period 1930 to 1991. KB also includes the card file, collection of abstracts with indexes and key words, collection of books (more than 3000), journals and newspapers with the original publications.

The card file contains bibliographic data on 95% of the Russian publications concerning the Kola region as

well as more than 1000 papers by Kola scientists on other scientific problems. Since 1988 the number of records has decreased each year with 3151 entries in 1988 down to 2215 in 1991.

In 1992 the KSC Library began to duplicate its paper card file onto digital files. The translations into English of the Russian abstracts or summaries of the scientific articles on the nature and economy of the Euro-Arctic region are also loaded into the computer. The abstracts are supplemented by the UDC indexes and key words. In the English duplicate of KB is now entered all transactions of the Kola Science Centre since 1986, and major works on geology and ecology since 1960 are recorded. The volume of this information has now reached 1 Mb. The part of data (2377 entries) was transmitted to the Arctic Centre in Rovaniemi, Finland for loading into their database "Cold Climate Related Studies" and for transferring to the *PolarPac* database according to the agreement signed in 1991 for cooperation between the Kola Science Centre, the Arctic Centre of Lapland University and the Rasmuson Library at University of Alaska Fairbanks.

Unfortunately, the KB transformation of the archaic "paper" form into a modern electronic database progresses very slowly because of insufficient financing and poor technical equipment in the KSC Library. The absence of appropriate computers does not permit us to begin work with the "MARC" system or with directories on CD-ROM.

Despite this the active cooperation between KB and information specialists of the Information Agency "Perspectiva" (Apatity, Russia) does allow even now for western users to use KB as a reliable tool in a Euro-Arctic "grey literature" ocean. The Information Agency implemented in 1993 a machine translation of Russian papers as well as electronic mailing of bibliographic data of KB in response to the inquiries from western users. At the end of the year they are planning to add also the newest software for transformation of graphic files to text ones, so entering and processing of the scanned Russian texts would also be available. All these measures will undoubtedly promote progress towards the integration of KB into the polar information network.

Acknowledgments

The authors would like to express their gratitude to the polar librarians of UK and USA and especially to Mrs Martha Andrews, Dr Jerry Brown and Mr William Mills for their help in seeking travel grants for attendance at 15th Polar Libraries Colloquy. We would also like to thank the International Science Foundation and the John D. and Catherine T. MacArthur Foundation as the main sponsors. The Kola Science Centre also supported us and provided a suitable working environment for us to complete our presentation.

The trials and tribulations of acquiring Russian material: the experience of the Scott Polar Research Institute Library

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Abstract: Chaos, confusion, frustration and excitement are words that can be applied to the current situation in Russian publishing. In this paper, I illustrate how these relate to our experience of acquiring Russian material at the Scott Polar Research Institute Library against the background of the history of the collection. I explore some of the solutions we have tried, and consider the way forward.

Key words: Russia, economic crisis, acquisitions, book trade, SPRI Library

Introduction

The word "chaos" comes readily to mind when attempting to summarise the current situation in Russia, and this is reflected in our experience of acquiring Russian printed material for the Scott Polar Research Institute Library. In this paper I will present the main difficulties we are experiencing, solutions we have tried, as well as the positive aspects of the new order. To put the current situation into perspective, I will briefly outline the historical background to our Russian collection and contrast past practices with present ones.

The existing Russian collection

The systematic acquisition of Russian (Soviet) printed material dates back to the 1930s when Professor Otto Schmidt (then Director of the Arctic Institute in Moscow) visited Cambridge and met members of SPRI. Exchanges between SPRI (mainly with our in-house journal *Polar Record*) and Soviet academic institutions were set up.

In 1947 Terence Armstrong was appointed to the Institute partly to organise the Russian collection and expand exchanges. The most notable, and one which is responsible for a large part of our monograph collection, is with the State Public Scientific Technical Library in Novosibirsk (known as GPNTB) which was set up in 1965. During his initial visit Dr Armstrong was shown a vast warehouse filled with duplicates and asked to select any books he wanted, all of which were duly shipped to Cambridge. Since then we have received lists of duplicate books, mostly 2-5 years old, from which we can order.

Like so many libraries, ours has benefited from many significant bequests and donations of sizeable collections from polar researchers. In 1951 SPRI acquired a large amount of polar material from Professor Leonid Breitfuss' library relating in particular to the Russian North. Another important contributor to SPRI's Russian collection was Ethel John Lindgren, a remarkable anthropologist who worked most of her life with the Saami and Evenki (Tungus). She gave many rare and valuable items to the Institute during her life, and in 1988, shortly before her death, arranged for a large number of books and papers to be transferred to the SPRI library. As a result, we have some unusual material on the Evenki, Saami and reindeer herding.

Our main source of new publications was through book agents: until 1991 Livres Etrangers in Paris (who went out of business in that year) and subsequently Collets in Britain until their demise in 1993. We selected items listed in *Novyye Knigi*, which was an indispensable weekly periodical, particularly as it provided a substantial summary of forthcoming publications. We also obtained a certain number of Siberian publications from GPNTB and received copies of new books directly from academic institutions and individuals aware of our interests. Apart from duplicates obtained from GPNTB via their lists, we have had two other main Western sources of second-hand books and journals: Scientia (The Netherlands) and Oriental Research Partners (USA)

Periodicals were obtained both through exchanges and subscriptions through Western agents (ie. Livres Etrangers and Collets). SPRI has a substantial holding of Soviet/Russian periodicals which has been considerably augmented by copies of relevant articles selected from other journals received by the University's Scientific Periodicals Library.

Until the present economic crisis the acquisition of Soviet polar material ran fairly smoothly. The exchange with GPNTB in Novosibirsk generally worked well although there were and still are some drawbacks. The duplicates lists do not have any information on the content of the material available and there has been little feedback on the processing and fulfilling of orders. However, this is not a unique situation. GPNTB have not been able to offer active searching for specifically polar material. This is not a criticism, rather a reflection

of the enormous operation of their exchange department. The Soviet library system, as in many other areas, suffered from over-manning and lack of inter-departmental communication, although one may feel envious when viewing the running of the SPRI Russian collection by one half-time bibliographer. The other main problem was that the exchange with GPNTB was set up on a cost basis. As a result we have received numerically much more than they have but in cash value less. This disparity has now considerably diminished with the increase in the amount we receive in exchange and the increased cost of books and journals.

The 'Glasnost' changes

In 1990 when I took up the post of Russian bibliographer, political changes, especially Glasnost, were beginning to have an impact on our Soviet collection. With the relaxation of censorship, and the opening up of hitherto closed archives, there grew an optimism about the future of publishing in the Soviet Union. There was initially a blossoming of new independent publications, in the North of native literature, and, to Western readers, far more interesting content in many newspapers and books. This led one of the Institute's members, Dr Piers Vitebsky, to set up an exchange in Yakutiya (later Respublika Sakha) with local contacts whose remit it has been to obtain any material relating to our area of interest. In return Dr Vitebsky has been allocated a portion of the library's budget to purchase material for these contacts. Inevitably some material has duplicated existing holdings but at least 60% is new to the library and much unobtainable through any of the normal channels.

Students and other members of the Institute, who have visited Russia have similarly brought back much valuable material. Although SPRI library has always benefitted from such material, there is no doubt that the new political order has resulted in a wealth of interesting books, journals and documents, especially in the field of ethnography.

At the same time, a large amount of second-hand Russian material became available in the West, as a result partly of the demise of several small Russia libraries. North Star Books in Montreal provided us with many interesting books, but have not been heard of since last year.

Soon, however, the economic crisis became the overriding feature of acquiring Soviet material. The first casualty as far as we were concerned, was Livres Etrangers in Paris and then Collets, whose reliance on trade with Eastern Europe and inefficient practises led them to go out of business in 1993. The causes of the crisis in the Russian book trade were the inexplicable paper shortage (in a country with the largest forests in the world), and resulting huge increase in the cost of paper, followed by hyper-inflation affecting the costs of printing, binding and especially postage. By 1992 the level of book production had fallen to pre-war levels ie. 300 million. The lifting of censorship, a welcome event, has resulted in the growth of detective stories, erotica, translations and reprints at the expense of serious literature and academic work. Unfortunately polar libraries do not have much call for either erotica or detective stories. The dramatic fall in book production is reflected in our acquisitions over the last few years. We currently have 165 monographs published in 1990, as opposed to 35 published in 1993. Of 90 orders for books ordered and due to be published by established publishers such as Nauka between May 1991 and May 1993, we have only received 20.

Although there is no longer any overt censorship or direct state control of publishing, the giving of subsidies by the government to certain publishing houses in fact means there is still some political control of publishing, affecting mainly small independent publishers. Nauka, once the Academy of Sciences' publishing house, through subsidies can afford to publish relatively large numbers of books and journals although, as I mentioned above, they too have reduced their output.

The book trade has also been subject to high taxes and export tariffs, in particular for reference material, including dictionaries and any bibliographical material. St Petersburg seems particularly blighted by strict customs duties and it is often much easier to export material from other parts of Russia, even Moscow. Yeltsin issued a decree on 12th November 1993 "On Additional Measures of State Support for Culture and Art in Russia" which exempts state libraries and museums from VAT on printed material received in exchange and customs duties for material sent abroad. As yet we have not noticeably benefitted from this. However, in speaking to our Russian counterparts I have found some confusion about these restrictions.

As a result of all these and other economic problems, many academic journals have ceased publication, and some publishers are trying to sell journals directly to the West for dollars, especially in translation. When Collets ceased trading, SPRI transferred nearly all its subscriptions to Russian journals to exchange partners, in particularly GPNTB. This was doubly useful as with the demise of many Russian journals and others being no longer available in Russia, the journals exchange had become in many cases quite unequal. Journals have also changed titles, sometimes more than once, and not always with notification. Often several issues arrive at once so that chasing up missing journals could become almost a full time occupation. It is often no easier for our exchange partners to monitor our subscriptions since they receive no more information than we do. There are also new journals being published, which we do not hear about from our exchange partners.

The key to many of the problems now afflicting libraries both in Russia and those trying to acquire

Russian material abroad is lack of communication: lack of communication from publishers about forthcoming publications, and poor dissemination of information. With the advent of e-mail, now spreading through Russia, we thought all our communication problems would be solved, but old habits die hard. Although messages are received, replies do not always come promptly. However, there is now support from IREX (International Research and Educational Exchange), who are creating a Russian-American network of librarians and archivists for international consultation and information via electronic mail. The aim is to improve communication both between American scholars and Russian libraries, and between Russian libraries and archivists. They have set guidelines about responding to e-mail. Maybe too, in the future e-mail will solve all the problems of book production, by the transfer of published material electronically to our library!

One of the greatest difficulties is the lack of information about forthcoming publications. We ceased to receive *Novyye Knigi* in 1992, which had been an invaluable source. It is now being republished and available for £55 per year. However, according to a British bookseller, most of the material listed is never published. We only receive information from one publisher, Nauka, who sends out "plans" twice a year. Russian libraries are just as much in the dark about new literature, but recently wholesale book markets have opened in Moscow in the Olimpiyskiy Stadion and in St Petersburg. This is more or less the only source of new publications for most Russian libraries and academic institutions. Many libraries in Britain now issue blanket orders to their exchange partners, but for more specialised libraries such as a polar library, this is not possible.

Although the cost of printed material is now much greater, it is still at present lower than that of Western publications but the quality of presentation, printing and binding is often very poor. If inflation continues then the cost of publications will outweigh their value. The exchange system, which has served so well, may then break down. There may be pressure to sell only for hard currency; this in fact did occur some 2-3 years ago, when an ominous silence fell on our main exchange partners, while they were considering whether to abandon exchanges, especially with books.

Future prospects

Finally, I would like to consider the way ahead. We will continue to rely heavily on exchanges and aim to maintain as much personal contact as possible with our exchange partners, visits both ways being essential. We are also planning to extend our use of "field" agents, initially in the Chukotka, Magadan, and Vladivostok regions. We are also looking into employing an agent in St Petersburg to identify and acquire new material.

One of the positive aspects of the new order is the regular and rewarding visits of Russian polar researchers to SPRI. Through them we have received journals and recently published monographs, and have set up further exchanges. Of late there have been fewer Russian visitors due to financial problems, and I hope this trend does not continue. Personal contacts in my opinion play an essential role in the acquisition of Russian material and should not be seen as just the icing on the cake. In the words of the much maligned Karl Marx "Library Workers of the World Unite".

Access to Russian glaciological literature

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Abstract: The literature on glaciology published in Russia and the other states of the former Soviet Union is extensive. For example, an annotated list of Soviet literature for 1989 published in *Materialy Gliatsiologiskikh Issledovanii* lists almost 800 titles covering all areas of snow and ice research, with the exception of permafrost. This paper describes steps taken to determine what percentage of the Russian literature is received, indexed , and available to researchers in the U.S. It also reports on preliminary discussions between representatives of the Institute of Geography of the Russian Academy of Sciences and the World Data Center A for Glaciology on steps needed to make this literature more readily available.

Key Words: glaciology, bibliography

Introduction

The International Geophysical Year (IGY), 1957-58, was an important period for the study of glaciology as a discipline. The previous international polar research projects (First and Second International Polar Years, 1882-83 and 1931-32) had no specific glaciology programs; however, planning for the IGY did include glaciology. The concept of glaciology was rather narrow at the beginning of the IGY (only glacier ice), but expanded gradually to include all studies of natural or artificial ice and snow (Field 1987). This year also saw the beginning of the World Data Centre System to handle the volume of data which the research programs would generate.

The former Soviet Union, and now the Russian Federation, is the largest Arctic country in the world with several million people living and working above the Arctic Circle. In this land where ice and snow are major facts of life, the study of glaciology, the science of snow and ice, holds a prominent position. In 1961, the first issue of *Materialy Gliatsiologicheskikh Issledovanii; Khronika, Obsuzhdeniia* (Data of Glaciological Studies; Chronicle, Discussion) was published by the Institute of Geography of the USSR Academy of Sciences with the "object of a closer contact among glaciologists participating in the International Geophysical Year" (*Materialy*, vol.1, 1961). Among the regular sections included in that publication was one on bibliography, and bibliographic control of the glaciological literature continues to be a significant part of the Institute of Geography's role in the discipline. In 1983, an annotated bibliography of Soviet literature on glaciology for 25 years (1956-1980) was published (Kotlyakov & Chernova 1983). The list was categorized into seven broad snow and ice areas and contained over 11 000 titles. Annual bibliographies appeared after that on a fairly regular, but delayed, schedule. The research for this report was initiated by a proposal from the Institute of Geography (IG) to supply WDC-A with copies of the glaciological publications which were missing from our collection.

Methodology

WDC-A for Glaciology wanted to discover what percentage of the Russian literature was reaching the bibliographic data bases to which we have easy access, and were some subject areas more often available than others. A comparison was made between the "Annotated List" (Kotlyakov & Chernova 1992), on which this study will focus and the NISC Corporation CD-ROM, *Arctic and Antarctic Regions* (AAR). This CD was used for several reasons: ease of use (the Autodex feature allowed us to see multiple spellings of the Russian names and we could limit the search to items published in 1989); the wide range of libraries that could be accessed with one search; and source identification for the material for Interlibrary loan.

Results

There were 787 titles in the 1989 Annotated List, divided into 10 categories: basic problems of glaciology, physics and chemistry of ice, atmospheric ice, snow cover, snow avalanches and glacial mudflows, sea ice, river and lake ice, icings and underground ice, glaciers and ice sheets, and paleoglaciology. Frozen ground and permafrost studies are not included in the Russian definition of glaciology; they are considered by independent institutes.

Table I. Subject categories from *Materialy* compared to Arctic and Antarctic Regions CD-ROM

Categories	Number of entries	Number on disc	Held by CRREL	SPRI	WDC	Two or more	Percent duplication
Basic problems of glaciology	72	31 (43%)	7	8		16	52
Physics and chemistry of ice	57	18 (32%)	5			13	72
Atmospheric ice	102	47 (46%)	44	2		1	2
Snow cover	73	30 (39%)	17		1	12	40
Snow avalanches and mudflows	67	39 (58%)	33			6	15
Sea ice	93	49 (53%)	11	1		37	76
River and lake ice	92	25 (27%)	19	2		4	16
Icing and underground ice	48	29 (60%)	20	1	1	7	24
Glaciers and ice sheets	112	78 (70%)	19	3	1	55	71
Paleoglaciology	71	26 (35%)	19	1		6	23

Table I shows the subject category from *Materialy*, the total number of entries per category and the number of references found on the AAR disc and as a percentage of the total. The other columns show which libraries hold the material whilst the final two columns indicate where two or more libraries have catalogued the material and the percent of duplication among libraries. This table tells us a great deal about Russian language glaciological literature holdings. The numbers give us an indication of collection patterns. Holdings on AAR range from a high of 70% for *Glaciers and Ice Sheets* to only 25% for *River and Lake Ice*. The data verify the fact that the Cold Regions Bibliography is the premier source for Russian language technical material relating to snow and ice; if only one library has a publication, it is likely to be CRREL. The table also indicates how much time, energy and money we are investing in duplicate cataloguing. With exceptions in a few categories, a significant percentage of Russian glaciological materials as held (and catalogued) by two or more libraries. But these details, while confirming commonly-known facts and problems under discussion, are not the primary focus of this report.

WDC-A wanted to know if particular categories of materials were being systematically missed. The next step in this study was to look for patterns of inclusion or exclusion by focusing on specific categories, determining the type of publication - monograph/book/technical reports, journal/serial, or conference proceedings, for each item listed. I checked four categories, the two with the lowest holdings percentages - *River and Lake Ice* and *Paleoglaciology* - and two that were of particular interest to our group - *Sea Ice* and *Snow Cover* - (Table II). Although the type of material missing on AAR varied somewhat depending on the subject area, I seem to have determined that the spectre, grey literature (ceraia literatura), haunts us still and also speaks Russian. This analysis indicates that conference proceedings are generally difficult to find. For these four categories, proceedings contributed 40% of the missing and only 4% of the holdings; monographs/books were 33% (holdings, 29%) and journals were 25% (holdings 70%).

Table II. Holdings by publication type

	Journals		Books		Conferences	
	Not held	held	Not held	held	Not held	held
River and lake ice	7	22	10	27	49	
Paleoglaciology	14	12	49	26	3	
Sea ice	6	37	15	14	20	
Snow cover	22	20	14	6	8	4

A close look at the *Snow Cover* category indicated that much of the material not included on the AAR CD-ROM had come from non-Russian areas of the then Soviet Union, from Ukraine, Byelorussia and Central Asia; many of the publications on paleoglaciology were produced in the Baltic states.

Future plans

How can we gain bibliographic control over this incredibly diverse glaciological literature? During a working visit to WDC-A late in 1993, Dr. Ludmilla Chernova, the co-author of the *Annotated List* and a researcher at the Institute of Geography (IG) in Moscow, discussed ideas about bridging the gap. IG is interested in providing copies of the publications to us. How it is

done and what material is copied is yet to be determined. This report is a first step in determining which publications are needed, *i.e.*, setting up a profile of data requirements. Another preliminary step before any formalization will be an analysis of a pre-publication copy of the forthcoming bibliography (for 1990). IG will provide a copy and we can select material from it; IG will then provide photocopies of the literature selected. Planning is still very preliminary. There are numerous questions which we are continuing to discuss. Can we obtain material that is useful to our researchers in a timely manner? How will this effort be funded? Will non-Russian literature, i.e., publications from the now independent states of the former Soviet Union, be available? How can we coordinate with colleagues so that this effort is not duplicative?

By the 1996 Colloquy, I hope to have another report with answers to these questions, and ideally, discussion of an operational delivery system.

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Towards a Russian Arctic information database

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Abstract: Results of a survey of research and natural resource institutions and organisations in the Russian Far East and Arctic are presented. A total of 550 entries are available in a published directory and on an accompanying diskette. The majority of records are from the Russian Academy of Sciences organizarions based in the Far East, Siberia, Moscow and St. Petersburg. Recommendations are presented emphasizing the need for a more comprehensive and up-to-date survey by Russians in Russia.

Key words: Database, directory, Russian Far East, research organisations.

Introduction

In 1963, the Arctic Institute of North America published the book entitled *Institutions of the USSR Active in Arctic Research & Development* (Stanka & Frenkley 1963). It contained descriptions of 756 Soviet scientific institutions operating in the Arctic or doing research on Arctic problems in the fields of physical, natural, and social sciences. A list of 228 Stations was appended including their latitudes and longitudes. All materials reported were obtained from the open literature, primarily as a by-product of the work involved in preparation of the *Arctic Bibliography*. Although still a valuable resource, this classic work is now considerably out of date.

Numerous efforts are underway to compile current information on Russian institutions and organisations involved in the Arctic. As part of the support for the U.S.-Russia Environmental Protection Agreement, a directory of research and natural resource institutions and organisations of the Russian Far East has been in preparation under the direction of the authors for the past two years. Although not entirely an Arctic database, the approach utilized in this directory could provide a framework for a more comprehensive Russian Arctic Directory (RAD). The overarching premises of such an approach is that the task of developing a truly comprehensive information base for existing Russian organisations involved in the Arctic, regardless of their state of current activity, is best accomplished by information specialists in Russia. However, to accomplish this and to make the information internationally available, assistance from international polar information resources is desirable.

The present paper is based on the authors' efforts related to the project on the Russian Far East. Some concluding recommendations will elaborate on suggested future directions.

Review of known Russian Arctic organisational directories and databases

Greatly expanded access to individual Russians, organisations, and geographic regions has produced an avalanche of information about northern organisations involved in research engineering, technological and resource development and environmental protection, among many other disciplines. The Arctic Science conference in December 1988 followed Gorbachev's October 1987 speech in Murmansk encouraged the opening of the Arctic. Russian participants at the conference represented the many scientific organisations active in the Arctic and provided clues to the widely dispersed regional nature of the current scientific communities and activities. At the 14th Polar Libraries Colloquy, we learned of a regional information system (RIS) for part of the Russian North (Putilov 1992). Other regional branches of the Russian Academy of Sciences have produced detailed brochures describing their interests and capabilities. Perhaps the best known example of an actual directory is the one prepared by Krill Simakov for the Northeast Scientific Center based in Magadan (Simakov 1993).

During this Colloquy we learned more about several Russian information gathering activities, including those in Kola and Far East regions. A paper originally scheduled to be presented at the Colloquy by Vladimir Pavlenko was to discuss the creation of a Russian database. The information gathering role of the Arctic Research Center of the Russian academy of Sciences was alluded to in a Commentary in *Arctic* (Pavlenko 1993). It is our understanding that a Russian organisational database has been prepared in Russian by Pavlenko and his colleagues at the International Polar Institute at the request of a Canadian sponsor, and that it at present contains c.150-175 entries in Russian (pers. comm., Marianne Stenbaek June 14 1994). This database should be available in English soon, and presumably covers in

more detail some of the information contained in the following surveys and compilations.

In addition to our own activities, other initiatives are underway in Russia and several other countries to organise or make available databases containing information on Russian Arctic organisations, institutions and sites. These include, but are not limited to the following:

(1) Arctic Center, Rovaniemi, Finland: The Arctic Center at the University of Lapland was perhaps the first non-Russian institution to begin gathering and disseminating directory information on Russian Arctic organisations. An e-mail file available from the Center comprised some 60 institutions mainly from the Murmansk region. A summary list of organisations appeared in the MAB Northern Sciences Network Newsletter (October 1993, pp. 25-26) and updated information is now available from Liisa Kurppa (see paper this volume).

(2) Svanhovd Environment Centre, Svanvik, Norway: A database on organisations involved in environmental research in Arkhangelsk and Murmansk Regions is available and contains c.70 entries, mostly from the Murmansk Region. Much of the work in compiling the information was done by INEP, Kola Science Center, Apatity. A small directory of the Kola Scientific Centre (KSC) was made available at the Colloquy and contains information on 11 research institutes and additional support activities located in Apatity, Kivosk and Murmansk

(3) MAB Northern Sciences Network, Danish Polar Center, Denmark: The MAB NSN has for many years maintained an information directory of research sites throughout the circumarctic region, primarily through the work of Charles Slaughter in Fairbanks, Alaska. The October 1993 issue of the Network Newsletter contained an annotated list of terrestrial sites, stations, and protected areas for all eight Arctic countries (Slaughter *et al.* 1993). Seventy five of the c.250 locations were from Russia north of 60 degree. Since publication, changes in the database have been made to addresses, phone and fax contacts and e-mail addresses are being added. The databases will be maintained by the MAB Secretariat at the Danish Polar Center.

(4) Canadian Department of Indian and Northern Affairs: A complementary directory of circumpolar research stations has been under preparation in Canada for a number of years by Peter Adams. The latest compilation was published in January 1994 as a working document (Adams *et al.* 1994). It contains c.50 Russian locations and an additional 20 entries from several sources included in the Far East Directory discussed below and the MAB directory. Vyacheslav Shamin, Director, Information Agency "Perspektiva", provided assistance for part of the compilation.

(5) International Arctic Science Committee, Oslo, Norway: Although IASC is not presently compiling a directory, it has access to considerable information on Russian organisations through its Executive Director, Odd Rogne, and national representatives of the IASC Council and Regional Board. Included is information on the more than one hundred polar stations in the Russian hydrometeorlogical network and some recent closings.

(6) International Science Foundation, Washington, DC (see Watson & Sher 1994): The ISF, as part of its two-year, $100 000 000 grant program to Russia and FSU republics, has plans to make available a list of c.1600 institutions, addresses and phone numbers from throughout Russia and the former republics. The computerised database represents institutions from which proposals were received during the long-term research grant competition in 1993 and 1994. It is of course not limited to the Arctic or Russian science and related communication activities.

(7) 15th Polar Libraries Colloquy: The third edition of the Polar and Cold Regions Library Resources was presented at the Colloquy and contains information on 7 Russian institutions with library holdings on the Arctic (Andrews *et al.* 1994). A paper by Markusova presented additional information on the Far East Branch of the Academy of Sciences, as did the paper by Vinogradow and Kabdulova for the Kola Science Centre (see papers this volume).

(8) *The Directory of Environmental Groups in the Newly Independent States and Baltic Nations* published in 1992 by Kompass (Pendill *et al.* 1992), provides an extensive listing on environmental, governmental, non-governmental and academic organisations some of which have branches and offices in the Far East and Russian North. The same can be said for the publication *Russian Government Today* (1993) compiled, updated and published by Carroll Publishing Company, Washington DC. A guide or directory of non-government organisations in the Far East has been prepared through the Catholic Relief Services, Baltimore, Maryland, but the 1993 edition is out of print. A report by the Volunteer Executive Service Team (VEST) on its visit to the Far East contains considerable information on NGO activities in the Far East (Lear & Gorman 1994).

The Far East Directory and Database

Kompass Resources International (1994) has compiled an institutional and organisational database under the

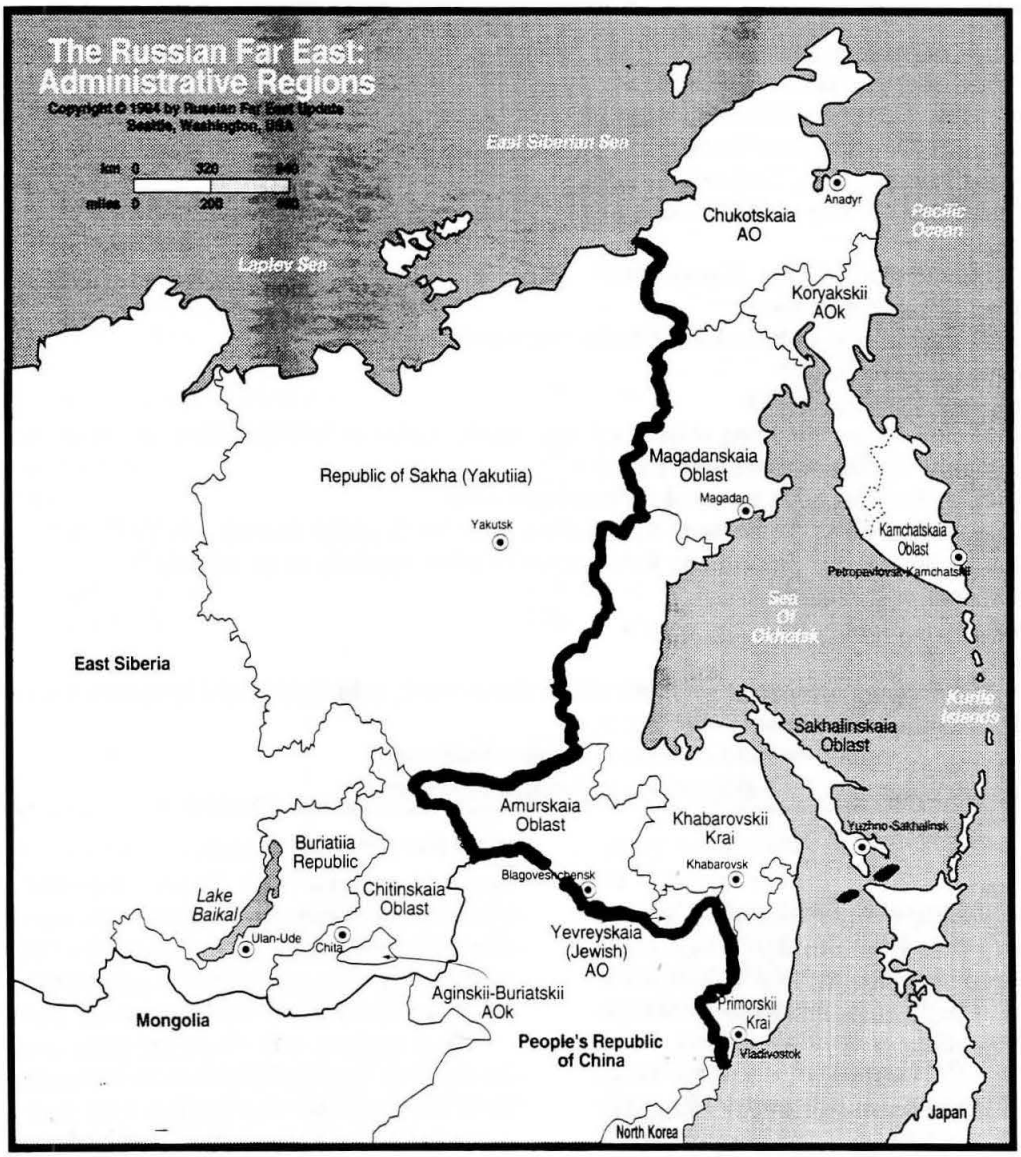

Fig. 1. Map of the administrative regions of the Far East. The region east of the heavy black line is considered for this report the Russian Far East (modified from Russian Far East Update, April 1994, Seattle, Washington).

direction of the authors for the U.S. Department of State and in support of the U.S.-Russian Memorandum of Agreement for Cooperation in the Field of Environmental Protection and its program Area X: Arctic and Subarctic Ecosystems. The database was prepared in order to provide an easily accessible source of information on current scientific and resource organisations in the Russian Far East. The principal administrative regions and capitals of the area under consideration are shown on Fig.1. In addition to those organisations resident in the Far East, a partial list of institutions and organisations located outside the Far East, and having known activities or programs in the Far East and elsewhere in the RussianNorth, are included in the database. Emphasis is on research and natural resource organisations with some Non-Governmental Organisations (NGO) included. This database should provide a starting point for those initiating activities in the Far East and the Russian North, but does not claim to include every relevant organisation and institution within the Far East. This version was prepared, in part, for presentation at the 15th Polar Libraries Colloquy, Cambridge, UK, and as a guide for those attending the AAAS Arctic Science Conference in Vladivostok (August 1994) and the International Conference on Arctic Margins in Magadan (September 1994).

The format of the database is modified from the one developed for the U.S. National Science Foundation by SRI International (SRI International 1993) and runs on Fox Pro 2.5 for DOS database software with a Cyrillic overlay. The data entry format for our database is shown in Table I and served as the basis of a widely

Table I. Data entry format for FoxPro 2.5 for DOS database.

City	<City>
Institute	<Name of institute, university, ministry, or non-governmental organisation in English>
RusInstitute	<Name of Organisation in Russian>
Affiliation	<Ministry, Parent or Affiliated Organisation>
Director	<Name of Director, Last Name, First, Patronymic>
Address	<Street Address, City, Code>
Phone	<Telephone number with city code first>
Fax	<facsimile>
Email	<electronic mail address, if available>
Telex	<telex or cable number>
Total staff	<total organisation staff, including technicians and support staff>
Rse staff	<senior research staff>
Emphasis	<key words and phrases>
Info	<brief description including major facilities, special collections, equipment, ships, libraries, etc. if not listed under lab/department/field station>
Instnum	<unique identifier code for database management>
Labdbtnum	<unique laboratory, department, field station code for database management>
Lab/Dep/FS	<unique laboratory, department, field station or other subdivision of institute>
DirName	<Surname of Director>
Phone	<telephone number with city code>
Staff	<total staff>
Speciality	<brief description of special emphasis of lab, department, field station, and long-term field sites including major facilities, equipment, ships etc.>
Latitude	<location identifier for field stations and major field sites>
Longitude	<location identifier for field stations and major field sites>

circulated questionnaire.

The database was compiled from readily available published and unpublished information, individual Russian sources, as well as numerous U.S. Government agencies, scientists and individuals that have visited the region or have active projects (see Appendix). The detail given in the entry varies from an address to an extended description in the emphasis and/or laboratory data fields. In general, we avoided simply listing addresses, but in a number of instances this is all that is available at present but additional information can be added in the future.

The information presented in the database was acquired over a two year period, and during this time many changes in personnel and organisations occurred. Several Russian scientific colleagues were requested to survey Russian institutions and organisations, and these efforts resulted in c.100 initial data entries. The Magadan directory for the Northeast Scientific Center is by far the most comprehensive example from this region. The original document, available on diskette in both Russian and English, contains biographies of key staff and individual bibliographic references for each of the 40 or more laboratories in the four NESC institutes. Only the institute-laboratory part of that directory was uploaded onto this database. In an attempt to update the entries for the Far East Branch of the Russian Academy of Sciences, Valentine Sergienko, FEB RAS, supervised the corrections to the 34 institutions (representing a total staff of 8500 including 2500 researchers of the FEB). These corrections were sent by e-mail to us in early June 1994. However, resources did not permit corrections to the more than 100 subdivisions of these 34 institutions. Some additional information is available in the paper by Markusova (this volume).

Field stations and protected sites are listed in the database as separate entries or in the memo or emphasis field for both the Russian Far East and North. This compilation is incomplete and is based largely on information published in the MAB Northern Sciences Network Newsletter (Slaughter *et al.* 1993), the recently released Canadian Directory of Circumpolar Research Stations (Adams *et al.* 1994) and other unpublished sources. A Russian database listing c.100 protected areas of the Far East was made available in June 1994 by A.V. Andreev, but circumstances did not allow its inclusion.

The database entries focus on the institution and its personnel, past and present activities and capabilities including laboratories, field stations and other facilities. The digital database is presented in two sections:

Far East: Institutions and organisations and their subunits located in the Far East and listed by city.

Appendix A: Institutions and organisations located outside the Far East, but with some involvement in the Far East and/or other areas of the Russian North.

A second appendix (Appendix B) describes the Kola Science Centre of the Russian Academy of Sciences (KSC, undated).

Table II. Type and number of entries in Directory Database

	Far East		Non Far East		Total
Number of cities and locations	28		36		64
Type of Organisations and Affiliations (subunits)					
Russian Academy of Sciences					
Far East Branch	58	(153)			211
Moscow and St. Petersburg			19	(18)	37
Kola/Komi/Ural Branches			12		12
Siberian Branch			40	(13)	53
Other Academies - Agriculture, Medical	8		1		9
Government Ministries, Committees					
Reserves, Departments	67	(1)	50	(16)	134
NGO/Private	32	(1)	11		44
Academic Institutions	6		8	(36)	50
Total number of organisations	171		141		312
Total number of subunits	155		83		238
Grand total of records	326		224		550

A diskette version is available with the published database and includes:

1) MS-DOS text version in English and Russian of the index of institutions and organisations by city both in the Far East and elsewhere in Russia;
2) MS-DOS text version in English describing many of the Far East institutions and subunits;
3) MS-DOS text version of the Appendix (non Far East);
4) Instructions on how to use the English/Russian files in Word Perfect, Microsoft Word and other word processing programs that enable the use of Cyrillic character set.

The files on the diskette were prepared by down loading the entire Fox Pro 2.5 database into a Microsoft Word for Windows file and editing it to eliminate unused data fields and to improve the overall presentation of the information. The database is being made available on the accompanying diskette for easy computer access and to avoid more expensive paper publication. We anticipate making the database available on Internet later this year. In the interim, the Fox Pro 2.5 for MS-DOS database and diskette are available from Kompass Resources International.

Corrections can be sent to Kompass although there are no immediate plans to revise the database.

An index of institutions and organisations listed by city for both the Far East and Russian North is provided at the beginning of the main Directory. The entries are presented in English with the names of the institution given in both English and Russian. In many instances an entry has a number of subdivisions such as laboratories or departments.

Table II summarises the number and type of records in the present database. A total of 550 records represents 312 institutions and organisations and 238 subdivisions such as laboratories, departments and field sites. The statistics in the table are divided by organisational affiliations for the Far East and the non Far East. By far the largest number of records are for the Russian Academy of Sciences in both regions. Reasons for this are the result of easy access to published brochures and reports and numerous personal contacts. This bias is in part justified since many of the initial users of the Directory will have scientific interests with colleagues in Academy organisations. Other sources for governmental and non governmental organisations are available (Pendill *et al.* 1992, Russian Government Today 1993, Lear & Gorman 1994) and further development of a database such as this should take these and new sources into account.

Summary and recommendations

It may be said that there is no well-planned and consistent, long-term effort underway to systematically inventory, revise and make available information on organisations involved in the Russian Arctic and North. With increasing opportunities to work with Russian colleagues in their home institutions and at their field sites and stations, it is assumed that there are practical

reasons to develop and maintain a comprehensive directory of organisational assets. Such activities are currently underway in most other Arctic countries and it is the general expectation that each country will be responsible for preparation and updating these directories. For instance, Canada, Norway, United Kingdom and United States, among others, have published resource directories in the past several years (ACUNS, 1989,, Norsk Polarinstitutt 1991, SPRI 1990, ARCUS 1992) At the 14th Polar Libraries Colloquy, Putilov (1992) reported on a regional communication network for the Russian North and its expansion would well suit the needs of a Russian directory and its electronic delivery.

The Polar Libraries Colloquy seems a logical mechanism for encouraging such a systematic inventory of organisations, not only of Russian organisations, but for all counties with Arctic activities. A recommendation to this effect from the 15th Polar Libraries Colloquy could encourage international polar and Arctic organisations and countries to provide the necessary leadership and resources to establish a Russian Arctic organisational directory. The following might be considered in such a recommendation:

1) That there be development and updating of a comprehensive Russian Arctic Directory or organisations involved in the Russian North and Arctic, prepared by Russians in Russia and representing essentially all institutions, organisations and activities relevant to acquisition of future knowledge and sustainable development
(2) That the responsible Russian organisation or network or organisations be identified with the responsibility to establish regular electronic mail contact with comparable polar and Arctic organisations in other countries having interests in the Arctic.
(3) That the existing international databases be made electronically available to all interested parties through Internet and that they subsequently be consolidated, edited and updated to eliminate duplication and redundancies.
(4) That the participants of the Polar Libraries Colloquy agree to voluntary provide input to a Polar Information Directory from information readily available in their parent organisations.
(5) That future Colloquy include papers and sessions devoted to this Russian organisation database as well as other institutional databases related to polar regions.
(6) That international and national funding organisations be encouraged to support further development of the Russian Arctic Directory.

Acknowledgements

The authors personally thank and acknowledge the assistance of the many individual contributors to the Far East Directory (see those listed under Appendix: Sources). The Bureau of Oceans and International Environmental and Scientific Affairs (OES), U.S. Department of State, provided the principal financial support for the Russian Far East project, with Dr. John G. Van Derwalker (OES), providing advice throughout the project. The Arctic Division of the American Association for the Advancement of Science through Dr Gunter Weller's office at the University of Alaska-Fairbanks, provided funding for final report preparation of the database.

The second author provided overall guidance for database, computer and linguistic quality control and productions of the printed copy and the diskette. Rebecca Toth Juras, Kompass Resources International, was responsible for organising, inputting to and maintaining the majority of the database. Sonoma Lee Kellogg and Lisa Dickey, Kompass, updated and made revisions to the database and text, as did Anastasia Kitsul, summer intern at Kompass, who provided invaluable assistance in translating and data entry. Sergey Sheveiko provided valuable advice and expertise in the later stage of the project.

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Appendix : Far East Directory Sources

The following sources were used in the compilation of the database:

Russian Documents:

Directory of the Far East Branch of the Russian Academy of Sciences (unpub. 1993; draft English translation was prepared by Kirill Simakov, Magadan, and subsequent changes to the list of institutions (not subdivisions) were provided by Valentine Sergienko, Vladivostok, in June 1994).

USSR Academy of Sciences Directory (1989); much of this now appears in updated form in Russian Government Today prepared and published by Carroll Publishing Company, Washington D.C.

USSR Academy of Sciences, Siberian Division: Novosibirsk Science Center; Eastern Siberian, Yakut, Buryat, Tomsk, and Krasnoyarsk Branches; and Scientific Institutions in Chita, Kemerovo, Tyumen, Barnaul, Kysyl, and Omsk (1987). Additional brochures were available for individual Academy institutions.

START starts in Siberia, Russia. Academy of Sciences, Siberian Branch.

USSR Academy of Medical Sciences, Siberian Branch.

Non-Russian Documents:

Russian Far East Update (monthly newsletter; Elisa Miller, Seattle, Washington); map and regional summaries from several issues of the Newsletter.

Alaska Center for International Business (Far East newsletter and reports on Sakhalin, Vladivostok, Nakhodka).

Institute of Social Economic Research, University of Alaska-Anchorage (reports on the Far East by John Ticholtsky, Gunnar Knapp and others).

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Individual Russians:

Kiril V. Simakow, Magadan, provided the diskette and both Russian and English text for the Northeast Scientific Centre, Far East Branch, RAS.

Valentin Krasilov, All-Russian Research Institute for Nature Protection, Moscow, with the assistance of Stanislav E. Belilkov, Valrey F. Leonon and Tamara P. Belikova, prepared the introductory text on the Far East and provided c.60 entries for the Far East.

Valentine Sergienko, Far East Branch, RAS, Vladivostok, for corrections to the FEB Directory.

Alexander V. Andreev, Magadan, provided c.30 entries from Magadan region.

George Z. Perl'stein, Magadan, revisions and additional entries.

Andrei Sher, Moscow, for assistance in e-mail communication.

David A. Gilichinsky, Alexander Pavlov, Maria K. Gavrilova, Vyacheslaw M. Makeeyev, and Marina Leibman for assistance on terrestrial research site information.

Vladimir Solomatin, Nikolai Romanovskii and Dmitri Karelin, Moscow State University, for information on the faculties of Geography, Geology and Biological Sciences.

Igor Shiklomanov, State Hydrological Institute, St. Petersburg.
Anatoly Kotov, Chukotka Science Center, Anadyr.
Valentine Markusova, Moscow, for corrections and additions.

Other Non-Russian Organisations and Individuals
Arctic Center, University of Lapland, Rovaniemi, Finland (Liisa Kurppa).
International Arctic Science Committee, Oslo, Norway (Odd Rogne)
Parks Canada (Paul Grigoriew and Nikita Lapoukhune).
Indian and Northern Affairs Canada (Steven Bigras).
World Conservation and Monitoring Centre (Donald Gordon, Graham Drucker).
University of Alaska (Victor Fischer, Sven Ebbesson, Stephen MacLean).
National Academy of Sciences (Gary Waxmonsky, Kelly Robbins).
International Science Foundation (Gerson Sher, Elisa Chait).
ISAR (formerly the Institute for Soviet-American Relations; for source documents).
SRI, International (Ron Freign, Kathy Ailes).
Svanhovd Environmental Centre (Ragnar Vaga Pedersen).
National Oceanic and Atmospheric Adminstration (Joe Fletcher, Tom Murray, Barbara Moore).
U.S. Mineral Management Services (Dennis Thurston, Bradley Laubach).
U.S. Fish and Wildlife Service (Stephen Kohl, Peter Ward).
U.S. National Park Service-National Biological Survey (Dale Taylor).
U.S. Environmental Protection Agency, Corvallis (Robert Lackey, Dixon Landers).
U.S. Department of State (Cathy Campbell, John VanDerwalker).
U.S. Forest Service (Ben Steinberg, Eldon Ross, Charles Slaughter, Paul Soler Sala).

The Yakut connection: The Michael Z. Vinokouroff Collection

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Abstract: The Alaska State Library in Juneau and the Elmer E. Rasmuson Library share a very interesting and extensive archival source, known as the *Michael Z. Vinokouroff Collection*, acquired by the Alaska State Library in 1983. This is a unique corpus of materials on Alaska, Russian America, Eastern Siberia and Yakutia. In addition, it also incorporates sizeable materials relating to the Russian émigré culture in the United States, between the years 1920 and 1950. In the *Vinokouroff Collection*, the largest number of items and titles relate to Russian and Yakutian history; history of the Russian Orthodox Church in Alaska; some travel and description literature; and, original collections of Yakut poetry and literature: such as the work of Petr Chernykh, as well as additional biographical information about other literary and political figures of the area. It includes an interesting selection of socio-political pamphlets, leaflets and notations dealing with the early revolutionary milieu of Yakutia (The Sakha Republic). By collecting, preserving and sharing these resources, Michael Z. Vinokouroff has paid homage to his own complex Russian-Yakutian-Alaskan legacy. And above all, the collection testifies to Michael Z. Vinokouroff's desire to secure the historical memory of a culture and build a strong bridge connecting to Russian-Yakutian and Alaskan history. As a result of the extensive contacts established within the last five years by the University of Alaska with the Russian Far Eastern Region and its educational institutions, the *Vinokouroff Collection* has received a broader exposure and, consequently, numerous Russian and Yakut scholars have discovered the importance of these materials to Russia and the Sakha Republic.

Key words: Yakut poetry, Soviet Union, Russian refugees, Alaskan history, Vinokouroff, Russian Orthodox Church

Introduction

One of the purposes of the Elmer E. Rasmuson Library Archives it to collect, preserve and make accessible primary sources, diaries and papers that help to document the complex quilt of Alaska's history. How does the *Michael Z. Vinokouroff Collection* fit into this pattern? What are the links that tie it to the history of Russia, Yakutia and Alaska? What contribution does the collection make to the documentation of the Russian first wave émigré experience in the United States? Who are the leading characters to emerge from this panorama? And, finally, why was it important that this collection find an honourable place in Alaska?

The collector himself, Michael Vinokouroff, was born in 1884 in Yakutsk. He was a very striking personality and a brilliant man of unrelenting individualism and courage. Yet, he was also often described, by those who knew him well, as a misfit and a loner, who detested groups, conventions and generalizations. He was deeply rooted in Russian and Yakut culture, and devoted most of his life to the preservation of this heritage. In his own self-description he portrays himself in many roles: as a member of the Russian intelligencia; as an incurable bibliophile; a historian; a philosopher; a poet; an ethnographer; and even a political activist. The broad spectrum of his interest and his scholarship reveal a man of boundless intellectual curiosity and energy.

The collection he bequeathed does indeed, reflect the complexity of this persona and his legacy. He gave the *Vinokouroff Collection* to the Alaska State Library in honour of his own ancestry and its strong linkage to the history of Russian America. The arrangement for the donation was made by Ms. Antoinette Shalkop, a Russian scholar. At the time she was working in the Library of Congress, indexing, arranging and microfilming the Russian Church Archives. The work that Ms. Shalkop was undertaking represented to Vinokouroff the worthiest of aspirations, and the two scholars became friends. Ultimately, Vinokouroff was readily persuaded to bequeath his extensive and unique collection to the State Library. Upon receiving the *Vinokouroff Collection* in 1983, the State Librarian, Mr. Richard Engen, recognized its complexity, and summoned appropriate specialists, such as Dr. Richard Pierce and Dr. Lydia Black and others to the rescue.

The *Vinokouroff Collection* is multi-lingual. Russian and English language materials predominate, but there are also considerable sources in the Yakut language and numerous items in the Alaskan Native languages as well. Unfortunately, only a small portion of these records have been translated. A significant effort is currently being made by Yakut, Russian and American scholars to make these important records more accessible through translation.

The Michael Z. Vinokouroff Collection

The acquisition of such a massive and multi-faceted personal collection, assembled over a long period and spanning several countries, can be problematic. Many of the materials are fragmented, scattered, and the collection is not easily seen as cohesive. Yet, its overall value cannot be underestimated. The *Vinokouroff Collection* spans two-hundred and nineteen years - from 1764 to 1983 with the majority of materials falling into the 1911 to 1940 time period.

When the Alaska State Library completed the assessment of the *Vinokouroff Collection*, some portions of it were offered to other special libraries holding large Slavic collections. Thus, the Hoover Institution of the Stanford University acquired a significant portion of Russian revolutionary monographs and pamphlets. The University of Urbana-Champaign, accepted a large number of rare serial publications, and, the Rasmuson Library acquired about 800 monographs, largely in the fields of humanities and social sciences.

A comprehensive analysis of the entire *Vinokouroff Collection* is not intended here. The aim of this presentation is to provide a limited analysis and a humanistic background for the development of the collection. An initial, marginal analysis of the collection was already completed in 1986. The work was edited by Louise Martin, and was entitled: *Michael Z. Vinokouroff: a profile and inventory of his papers (MS 81) and photographs (PCA 243) in the Alaska Historical Library*

The *Vinokouroff Collection* offers the researcher a wide spectrum of materials, in a variety of formats, written by many hands, reflecting multiple socio-political and philosophical viewpoints. But above all, the collection of 105 boxes, depicts a colourful mosaic of irreplaceable personal and cultural history. It includes, but is not limited to: notebooks; letters; memoirs; diaries; personal and official documents; manuscripts; rare administrative decrees from Eastern Siberia; monographs; journals; photographs and some post-cards. It also embraces a great quantity of ephemeral, grey literature, such as political notes, leaflets and pamphlets.

A very revealing component of the *Vinokouroff Collection* comprises Vinokouroff's early memoirs and recollections as well as his own poetry. His youth, spent among a loving, close-knit clergyman's family in Yakutia echoes a harmonious world. Intermingled with these recollections are memories of his uncommonly deep friendship with the youthful, Yakut poet Petr Chernykh. Petr Chernykh and Vinokouroff shared many similarities in their youth. Both were educated in a Siberian Orthodox Seminaries, both shared an extensive love of literature and poetry and together they were also drawn into the whirlwind of political activism, as a result of which they were both imprisoned - Vinokouroff in 1918 - and Chernykh during the First World War. These early recollections have attracted the attention of numerous Russian and Yakut scholars. There is an escalating interest shown in the early years of development, writings and poetry of Petr Chernykh.

Petr Chernykh was born in the village of Inya, on the shore of the Okhotsk Sea. In 1894, his family relocated in Yakutsk. Being of mixed ethnic heritage, (his mother was Yakut, father was of Georgian-Russian-Tartar origin), Chernykh always considered himself to belong to both worlds: Russia and Yakutia. Yet, he considered Yakutia to be "the cradle of my youth, a cradle embraced by the harsh winds of the North, cradle rocked by the mellow tones of the Olonkho". (Chernykh-Yakutskiy 1982)

Both men share a rare spiritual closeness in their youth. They dedicate volumes of poetry to each other, addressing the other as "my soul mate, wonderful Petya", - "My dear glorious Misha", etc.

The early works of Petr Chernykh depict a tender poet on the verge of transition. They show a remarkable delicacy and deep reverence for nature. Rich in colour, graceful in outline they show an impressionist's vision of the Arctic world that surrounded him: as seen in: "A Winter Night", "Storm", and "A Memory". He is able to create an ephemeral universe of sun pierced snow, and multiple coloured spheres hanging in the dark sky. The early Chernykh combines light and shadow to create poetry that often expresses the transitory and precious nature of life. As the political milieu changes, the images become more restless. In the remarkable story "By the Blue Light", the winter images, deep shadows and the eerie light, separate the inhabitants of the room from an outside world of the brutal Yakut winter filled with "bottomless darkness", where one could detect the remnants of former hopes. As the story progresses, the two protagonists admit that their present reality seems to be slipping away, changing, and that "a sombre longing was growing like a thunderbolt at midnight"... and "an unspeakable gloom descended as a huge slippery wiper" over them. Somehow the poet has, in this collection, dedicated to Vinokouroff, captured the paradox of hope and hopelessness and the mood of the land caught in the abyss of change. Later, his poetic mood changes radically. He becomes Maxim Gorky's pupil and eventually Chernykh embraces fully the hope and the cause of the Revolution. The later work becomes dedicated to the theme of struggle and the re-emerging new Yakutia.

M. Z. Vinokouroff himself

The collection of materials in the *Vinokouroff Collection* is so extensive that it covers Michael Z. Vinokouroff's entire life from 1894 to 1956. There is considerable documentation regarding the Vinokouroff ancestry. Michael Vinokouroff is a direct descendant of an extensive line of well recognized clergymen who served Alaska. His grandfather, Georgii Ivanovich Vinokouroff, served as a priest in Novo Arkhangel'sk, from 1851

through 1863 and held positions of great responsibility (Shalkop 1980). His son, Zinovii Georgievich, Michael Vinokouroff's father, was born in Novo Arkhangel'sk in 1853, and later became the spiritual leader of the Yakutsk Seminary. Michael Vinokouroff's grandmother, Nadezhda Ivanova Ulianov, on the other hand, was the daughter of Ioann Ulianov, a St. Petersburg Russian American Company official and Maria Frumentievna Mordovsky, who was a daughter of one of the early Kodiak Island priests, Frumenty Mordovsky. Michael Vinokouroff's grandmother, Nadezda, died in 1862, was buried in Sitka, and her grave is well preserved even today (Shalkop 1980).

This unique heritage clarifies Vinokouroff's lifelong dedication and love for the history of Alaska. Of particular importance here is his intense commitment to the preservation and the recording of the Russian Orthodox Church records in Alaska. When he was working as an archivist of Russian American manuscripts in the Library of Congress, he became determined to secure permission to save as many of these records as possible, and in 1940 he did secure the approval of the Orthodox Church and the support of the Library of Congress to carry out this project. Unfortunately, many Alaskans initially saw this as a despoilment (A.H.L. 1986), nevertheless, 150 cartons of archival materials from Russian churches in Alaska were transferred to the Library of Congress. His constant commitment to that cause is further seen in the extremely voluminous personal, even intimate correspondence between him and Father Gerasim Schmaltz of Spruce Island, Alaska.

Who then was the man who left us such a varied and a rich legacy, dedicating most of his life in exile to the reconstruction and preservation of his Russian Yakutian heritage? Dr. Oleg Yakimov, of the Yakutsk State University sees him as a member of the Yakutian intelligencia, who was "carried away by the winds of revolution". Michael was born in Yakutsk in 1894, into an ecclesiastical family. Educated in a seminary, Michael becomes a poet, and a humanist and a political activist in the moderate wing of the Socialist Revolutionary Party. By 1917, Vinokouroff becomes mainly involved in the political and literary life of Yakutia, and as the political tempo escalates, the Vinokouroffs leave Yakutsk for Okhotsk in 1919 and by July 1919 they enter the Russian colony of émigrés in Japan. Unable to find suitable employment there, the journey in exile is continued and on February 11, 1921, they arrive in San Francisco, And so, another chapter begins in this voyage of uncertainty.

The revolution and the civil war had split Russia in two, literally and figuratively. A whole new term had to be coined for this phenomenon, as those Russians who were scattered, created the realm of "Russia Abroad" (Raeff 1993) Vinokouroff's life, in the United States, becomes an example of how and by what means the society in exile managed to carry on a culturally creative life in the new country, despite enormous difficulties and an overpowering sense of loss and nostalgia.

After a sequence of changing occupations, Michael Vinokouroff ultimately acquired a position in the Library of Congress in 1921, as an assistant in the Slavic Section. It is in the Library of Congress that he feels he can make a contribution to the new land, and ultimately also be able to serve the culture he had been severed from. Thus, exile or emigration for many often entailed a sense of mission beyond the task of mere physical survival. That mission to Vinokouroff was to preserve values, treasures, and traditions of the Russian-Yakut culture and serve his Russian American heritage as well. Many of these aspirations he was able to fulfil. He lobbied continuously as he continued to build his own archives, for the procurement and expansion of Russian monograph collections and archival materials and the preservation and organization of those materials found in the Library of Congress. As he stated, "For me, an immigrant, this was the height of success and happiness" (A.H.L. 1983). By 1944, Vinokouroff estimated that the twenty-two years spent in the Library of Congress had enable him to bring into it "923 large sized filing boxes of greatly valued archive material and other materials". Thus, to Michael Z. Vinokouroff, even in these distant shores, to secure and share the culture he so loved had become a reality.

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The importance of being a librarian in the computer world

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Abstract: Librarians have traditionally worked as intermediaries between the knowledge stored in libraries and researchers. But this situation has greatly changed since many new ways of storing and exchanging information have appeared. Thus librarians have been drawn into a new process of storing, processing, and distributing information among the scientific community, as well as information exchange. This paper analyses the present situation in scientific libraries in the Russian North using the Library of Polar Geophysical Institute (Kola Science Centre) as examples. Development of PC tools and e-mail networks coupled with storage and exchange of all kinds of information on PC files and CD-ROMs presents new and easy access for every researcher incorporated into the computer community to any scientific information. In this respect a librarian's duty is not only to provide, acquire and supply comprehensive information on the subject domain. A librarian has to be properly educated to be able to develop the necessary techniques and to support easy and friendly access to the tools. On the other hand, the role of a librarian to maintain human contacts among the scientific community is emphasized.

Key words: new duties of librarians, human relations, applying new techniques.

Introduction

Librarians have traditionally worked as intermediaries between the knowledge stored in libraries and researchers. But nowadays the situation has greatly changed because there have appeared many new ways of storing and exchange of information. Thus librarians now need to be involved in new methods of storing, processing and distributing knowledge and information among the scientific community.

This presentation will consider two independent, but closely connected, issues. The first one is devoted to the analysis of the situation in the Library of the Polar Geophysical Institute, Kola Science Centre. The second one will consider the problem of the place and the role of a librarian from the point of view of new trends and human relation.

Library of Polar Geophysical Institute

The structure of the Library of Kola Science Centre exactly reflects the structure of the Centre itself (Fig. 1). The history of the library goes back to the first years of the scientific station "Tietta" established in 1930 in the Khibiny Mountains. The books are distributed among the Institutes according to the fields of research and specialization. Thus the PGI Library contains all kinds of books,journals and publications on solar-terrestrial physics, space science, radio-physics, and the like. Today the book fund of the PGI Library is 85 285 items that constitutes about 12 percent of the total amount of books. Table I presents some figures illustrating functioning of the Library.

Table I: List of the main Russian and Foreign Journals (titles)

Russian journals (titles translated into English)
Geomagnetism and Aeronomy
Journal of Abstracts (Referativny Journal)
Computer Sciences and Mathematical Physics
Journal of Experimental and Theoretical Physics
Foreign Radio Electronics
Globe and Universe
Proceedings of Russian Academy of Science (Planetary Physics series)
Space Research
Letters to JETPh
Radio
Radiotechnics and Electronics
Journal of Abstracts (Physics)
Achievements of Physics
Foreign Journals missing from the Library since 1992
Planetary and Space Science
Geophysical Research Letters
Journal of Atmospheric and Terrestrial Physics
Solar-Geophysical Data
Review of Geophysics
Space Science Reviews
Radio Science

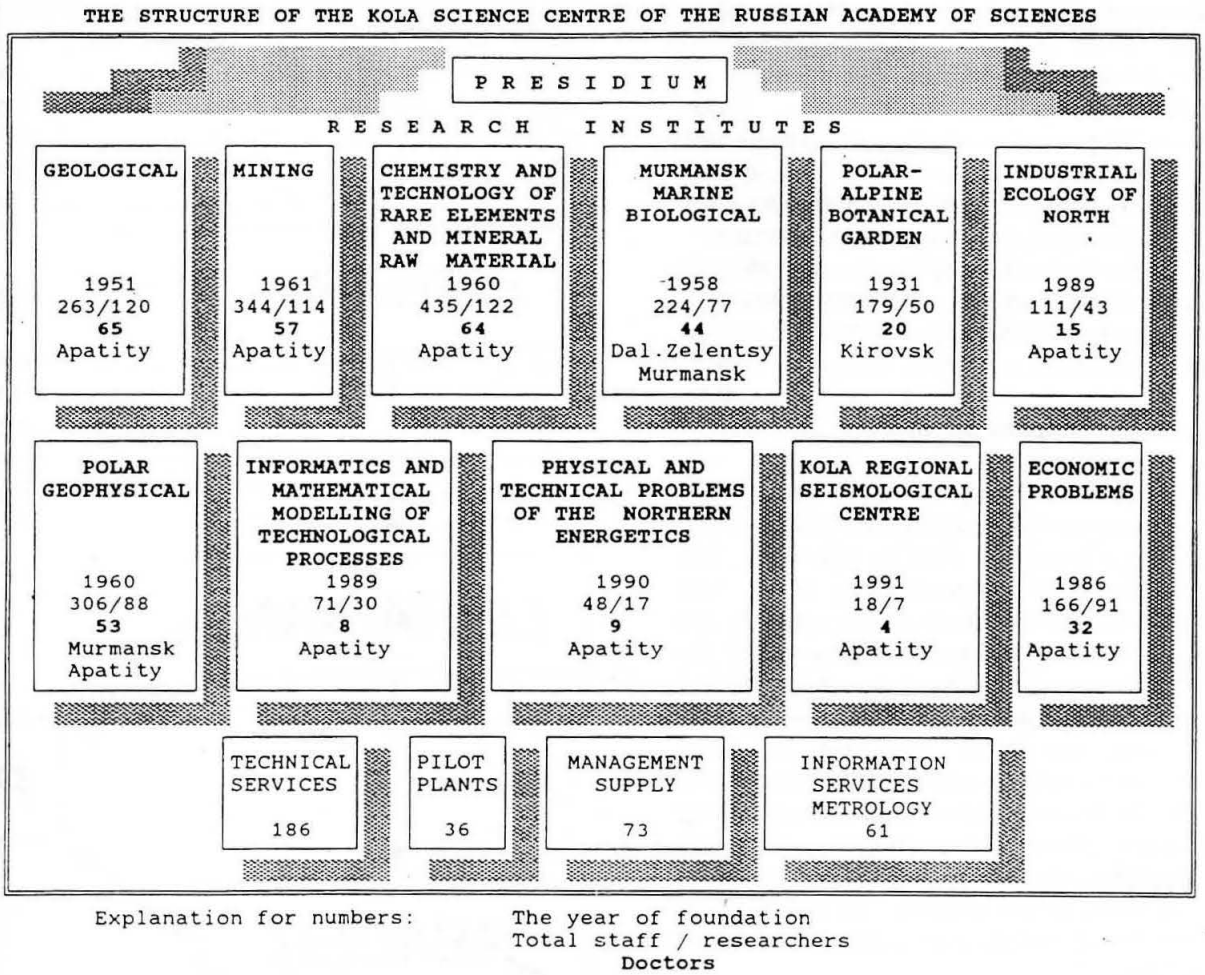

Fig. 1. Structure of Kola Science Centre. Each institute box shows year of foundation, total staff, number of researchers with number of doctoral researchers in bold, and geographical location of institute.

In former years the Library was supplied with new books and journals (including foreign ones) from a central library distributor. But now this system has gone and no foreign journals come to the Library any longer. The readers, who are mainly researchers, can no longer find some of vitally important journals (Table II).

The few foreign books and journals which have appeared in the Library during the last three years were either brought by PGI researchers or sent to the Library by foreign researchers or libraries. Thus the Library cannot fulfil its main duty, i.e. supply the researchers with new publications and provide necessary information for investigations. The situation has however slightly improved with the supply of some journals through the Soros Foundation.

Table II: Functioning of PGI Library

Year	Number of readers	New items received books (Russian/ Foreign)	journals	Number of retrieved items
1985	525	520/ 2	1058/342	24862
1986	554	416/ 9	987/349	20492
1987	545	587/11	1186/448	23588
1988	444	532/11	1142/446	30395
1989	427	877/54	1403/505	40987
1990	418	642/38	1120/456	36314
1991	431	520/ 9	848/571	33824
1992	373	307/ 0	596/369	22759
1993	337	153/ 2	305/ 42	11057
1994 (to June)	190	102/11	154/ 73	1686

Until recently the Library has not been equipped with computers and the researchers have been unable to use the world wide networks. This has now changed with the Institute incorporated into the RELCOM network in April 1993. Since that time the amount of the information transmitted through this means of communication has increased tremendously. Today there are about 25 persons on the list of end-users who use E-mail to exchange small amounts of data, discuss joint papers and exchange information. But this cannot substitute for books, journals, bulletins and publications. There are now prospects of being incorporated into the INTERNET network that will provide direct connection and access to the main global data bases.

A librarian and the computer world

It can hardly be denied that the 20th century has witnessed a unique evolution in human history which has resulted in a profound shift in our life. The worldwide network of communications is the most important infrastructure that binds people together and helps them to interact. Throughout the world the growth of telecommunications has been very rapid and it has its impact on the libraries too. These developments not only change our world view but also unite humanity into a common social neighbourhood and sooner or later the libraries of the world will merge into one global library connected through globa information networks. And thus we have to understand ourselves as organic members of this process. So the question arises: where should the place of a librarian be in this new scheme? (Fig. 2).

Let us consider the situation with a librarian, as it used to be, as a junction between a book and a reader. The main function of a librarian, i.e. to supply information, remains but it acquires new forms and trends. Here PC tools may play a significant role - both constructive and destructive. In a world of constant change requiring dynamic adaptability we have to unite the knowledge from books and the readers' desire to find and acquire such knowledge. Thus we have to become the conjunction that makes the two ends meet and provide constructive channels to make the process smooth. But on the other hand, we have to keep moderation and balance and make the process of interaction enduring, friendly and effective for a user (Minion & Goodwin 1991).

The destructive effect of this process lies in the loss of direct contacts with readers by being placed behind the machine while the reader is sitting in front of it. So we are losing the important human interaction component. How can we stimulate and encourage book computing and exchange of information through computer networks and still retain human contacts? Viewed from this angle high standards of quality are not to be sacrificed yet neither is the human relationship to the reader to be lost. We have to actively and personally participate in developing libraries so that they remain the most important storage of book knowledge and strive for keeping direct human relations with readers. This is not an easy problem to solve.

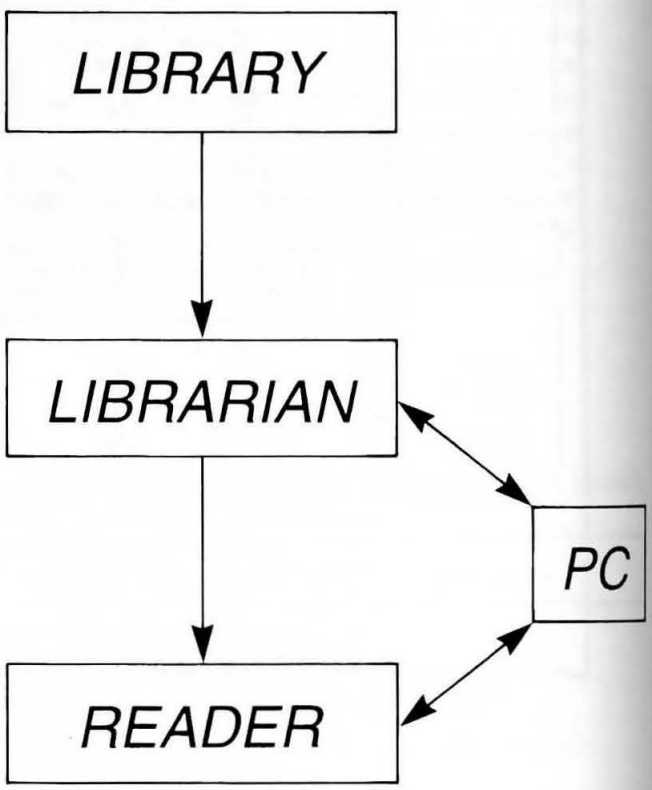

Fig. 2. Place of a librarian

East-West junctions

Throughout the decades after the Great October Revolution we became used to regarding the world as East and West. Now let us look at both sides as two great sources of information which are merging due to the development of communications. The amount of valuable information contained in books and various kinds of publications (including grey literature) is enormous but the gap between the two systems in technical support is frustrating. Most western libraries have already been equipped with modern PC tools and the materials available have already been processed and recorded. In the east we are only at the beginning. The libraries equipped with computers have started to compile data bases and reference books. If we want to be included into the world's network systems, we have to translate at least the titles and abstracts of our publications into English. This work is under way now

in Kola Science Centre. References or abstracts of KSC publications are being transferred as text files to Finland. This is going fairly well since the amount of the material is not very large. But we failed to transfer bibliographic references when we tried to do this using the MARC system. The MARC systems that are in use in Russia and in the USA turned out to be incompatible. This means that we have to elaborate a unified standard of presentation or adapt the systems so that the material can be readable and compatible.

Conclusions

1. Libraries are and will always be the main source of information for the scientific community.
2. Librarians have to work collectively to keep pace with technological development and to preserve human relationships with readers.

Acknowledgments

The author is grateful to employees of Polar Geophysical Institute and its library for their concern and the figures supplied.

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An analysis of the *PolarPac3* database using the WLN Collection Analysis Service

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Abstract: At the meeting of the 12th Polar Libraries Colloquy held in Boulder, Colorado, USA, in 1988, a statement of action relating to the development of an international polar information network was approved by the participants. One of the goals of the action statement was to develop "...a CD-ROM product." Following that meeting, a grant from the U.S. National Science Foundation was award jointly to the University of Colorado Boulder, Institute of Arctic and Alpine Research and the Elmer E. Rasmuson Library, University of Alaska Fairbanks to develop such a CD-ROM product. *PolarPac*, first edition, was designed, developed and produced in 1990. In 1991, *PolarPac2*, the second edition, was released with the addition of more monographic and serial records. *PolarPac3*, produced in 1993, incorporated the holdings of Scott Polar Research Institute Library, Cambridge University, and the Indian and Northern Affairs Canada Library. An analysis of the unique polar holdings is presented by subject, and by comparative data between both U.S. and international libraries. An attempt is made to draw a conclusion about the depth of polar literature available to researchers and a profile of circumpolar collection strengths is presented. Data suggest increasing holdings of diverse libraries to the *PolarPac* database will not change publication pattern distribution in terms of age of publication or subject distribution. A more surprising finding is that there is little collection development duplication occurring among the libraries analyzed.

Keywords: polar information, database analysis, collection development

Introduction

Organized research on the polar regions has taken place since Vitus Bering discovered Alaska in 1741. Attempts to collate and disseminate the results of research on northern regions--historical, scientific, ethnographic, etc.--- have been under way almost as long. The same can be said of the Antarctic regions, whose recorded research is said to have begun in 1773 when James Cook crossed the Antarctic Circle. While most scientific literature is organized along discipline lines, information on the polar regions has always been an exception to this. The interdisciplinary and multidisciplinary literature of the polar/cold regions is traditionally organized on a geographic basis (Thuronyi 1975). In the 1970s, there grew a heightened awareness that the Arctic and Antarctic regions played a major role in world climate and that change to these environments might have wider implications for more populated areas (Gourdeau *et al.* 1971).

When individuals think of the North, many think of the Klondike Gold Rush, but the exploitation of the natural resources of the Arctic began in earnest with the oil discovery at Prudhoe Bay, Alaska and the subsequent building of the Trans-Alaska Pipeline in 1974. What is often forgotten is that a coalition of environmental and native American rights groups temporarily halted exploitation of the Prudhoe Bay oil while native land claims and environmental safeguards were put in place (Coates 1991). Concerns about global warming in the Arctic (Walsh 1991), the discovery of the ozone hole in the Antarctic (Farman *et al.* 1985), and the understanding that polar environments must be protected (Griffiths & Young 1990) for the good of world climate have all contributed to an increasing awareness of the regions, both in the scientific community and among the general public. This increased interest by conservationists, environmentalists, oil companies, native peoples of the North, and other interest groups has led to an explosion of polar information.

Developing a Polar Information Database

The development of polar bibliography has been traced from the early 20th century until the present by Andrews (1988). Perhaps the premier example of this historical commitment to informing scholars of northern research results was the Arctic Bibliography, beginning in 1953. The Arctic Bibliography sought to be all-encompassing, but in 1975, it ceased publication--just as Arctic information and research began to proliferate.

After the demise of the Arctic Bibliography, it was necessary for numerous groups to provide control of their part of the literature to meet their Arctic research requirements. This piecemeal approach led to uneven coverage of the world's literature. Primarily due to the military importance of the North, the scientific and

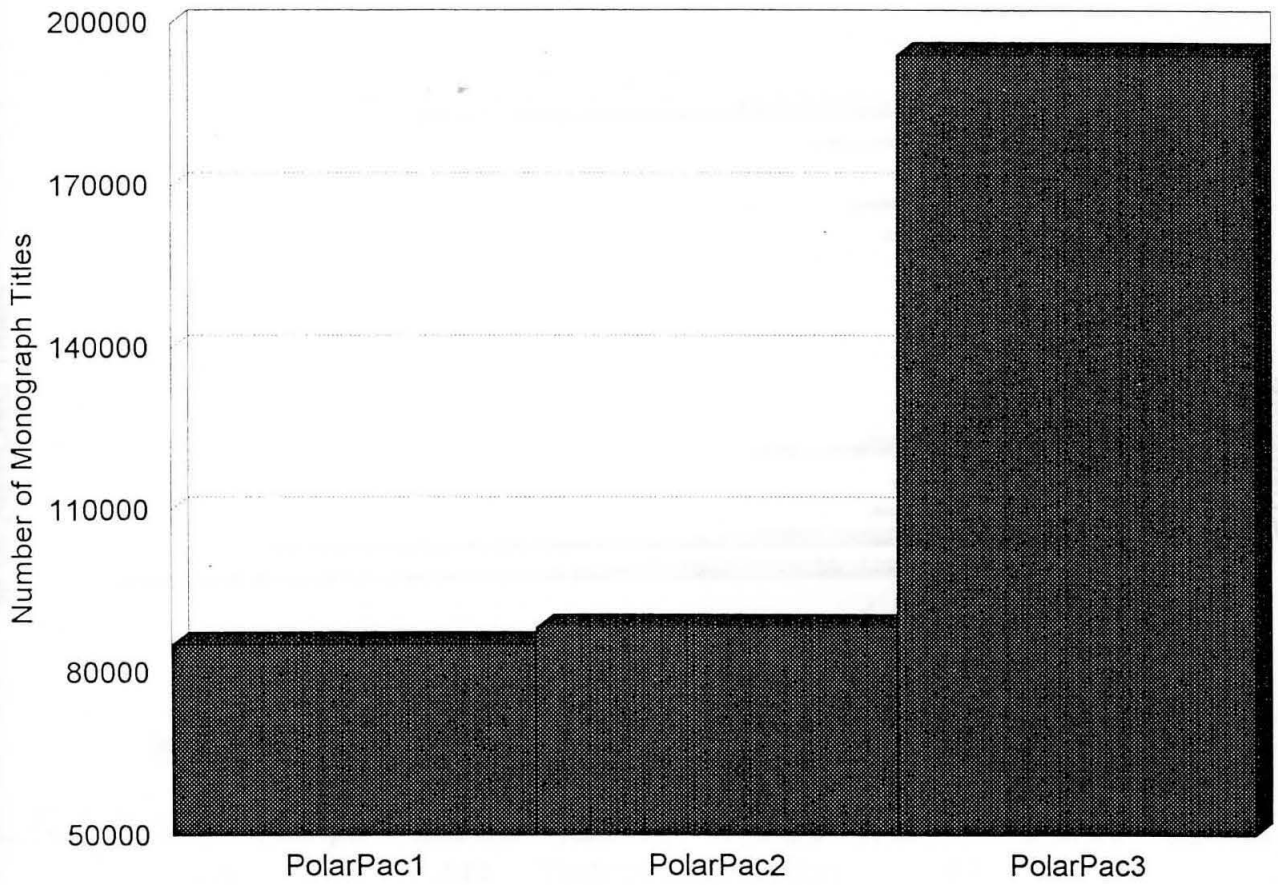

Fig. 1. *PolarPac* growth 1990-1993

technological disciplines had better control of the literature while other areas such as the social sciences and humanities were and are under represented in bibliographic control of northern information.

Polar researchers of all disciplines have long believed that they need more comprehensive access to information; the resolution of this problem has been made all the more difficult due to the interdisciplinary and international nature of Arctic and Antarctic research. By geographic definition, "Arctic" encompasses the United States, Canada, Greenland, Norway, Sweden, Finland, Russia, and other countries which historically have been involved in northern exploration efforts (Holden 1989).

Since the early 1970s there has been a high level of cooperation among polar librarians and, more lately, database producers, mainly through the biennial meetings of the international Polar [formerly Northern] Libraries Colloquy. This polar library community has long expressed the desire for a common polar information database. At the 12th Colloquy of the group in 1988, a vision statement and plan of action for developing such a database was endorsed by the Colloquy. Funded by the U.S. National Science Foundation, this vision became a reality when WLN (a bibliographic utility located in Lacey, WA used by all Alaskan libraries) was established as the on-line host for the information and the subsequent publication of the CD-ROM database, *PolarPac*, in 1990.

PolarPac1

Using the holdings of Alaskan libraries in the WLN database as a foundation, *PolarPac* was developed by adding the holdings of additional important polar libraries. Monographic records were added from the Stefansson Collection, Dartmouth College, and the Institute of Arctic and Alpine Research, University of Colorado-Boulder. Wishing to increase the serial portion of the database, a request for serial records by the Rasmuson Library of the University of Alaska Fairbanks resulted in 13 399 new serial records being added from libraries worldwide.

In the end, *PolarPac1* had holdings from libraries in Australia, Canada, Denmark, Germany, Finland, France, Greenland, Iceland, Italy, Japan, New Zealand, Norway, Sweden, United Kingdom and the United States. The database consisted of 85 293 records (West 1990). (Please note that all statistics refer to bibliographic records for books, serials, and other materials such as archival collections and maps, but do NOT include statistics for periodical analytic files contained on the PolarPac discs.)

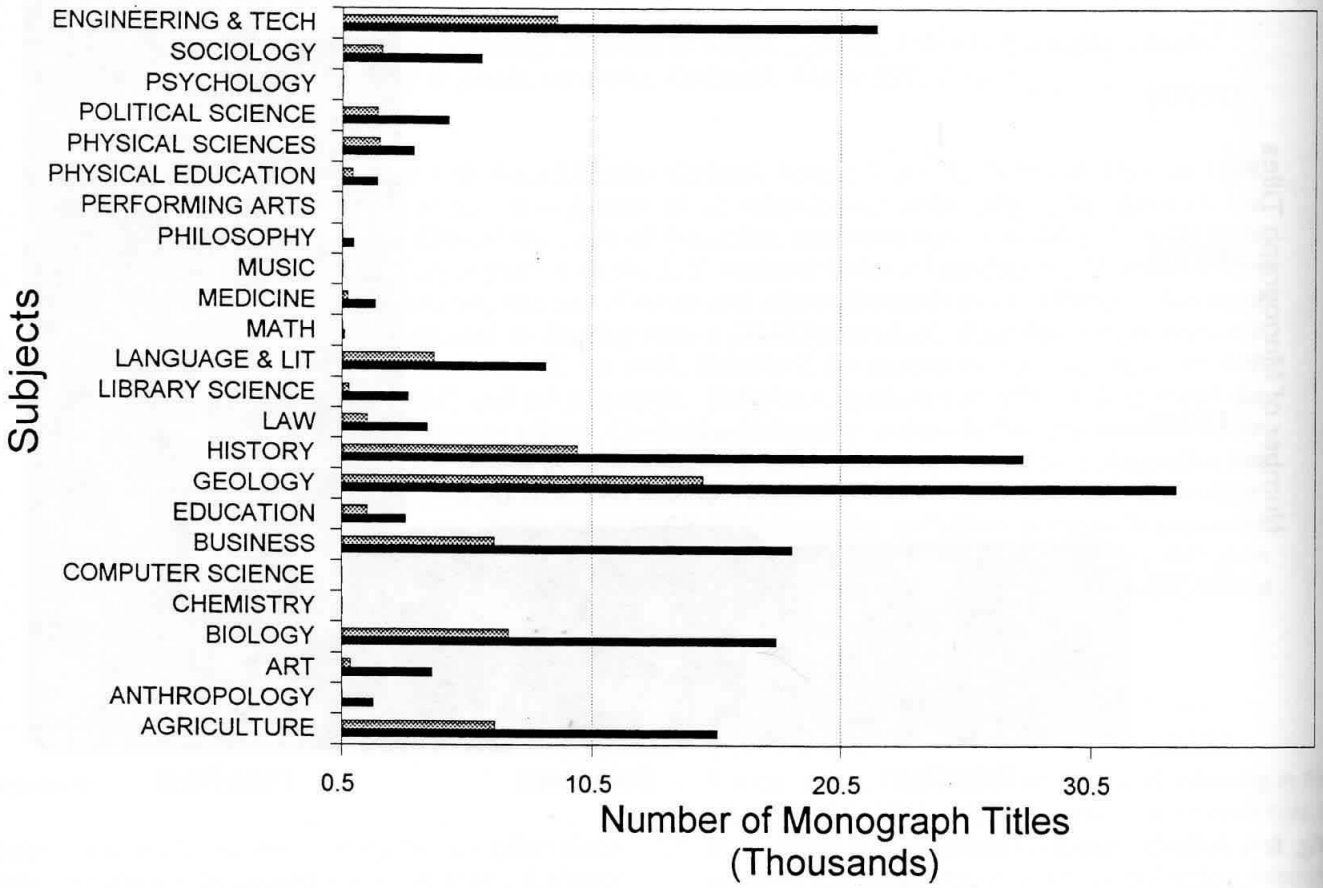

Fig. 2. *PolarPac* publication date comparison, *PolarPac2* and *PolarPac3*

PolarPac2 and *PolarPac3*

PolarPac2, produced in 1991, contained holdings of 32 libraries, of which the holdings of five were analyzed using the WLN conspectus software. (For an explanation of WLN Conspectus software, see West 1992). In total, PP2 had 88 539 bibliographic titles with 105 579 locations The major addition to PP2 was the addition of periodical analytic databases such as the Bibliography of Alaska and Polar Regions and the Oil Spill Public Information news file.

The *PolarPac3* database contains 194 325 monograph and serial records with 333 698 locations being reported. This represents a 119% increase in number of bibliographic records and a 216% increase in location information over *PolarPac2*. 125 455 records have only one location making that title unique to the database--a unique percentage of 65%. (Fig. 1)

Publication by date analysis

Fig. 2 shows the pattern of publication by time span in both *PolarPac2* and *PolarPac3*. Publication by date analysis was done using the bibliographic data for monographic records from: the University of Alaska Fairbanks (UAF); Alaska State Library (ASL); Alaska Resources Library (ARL); Scott Polar Research Institute (SPRI); and, Indian and Northern Affairs Canada (INA).

As might be expected, the period following World War II showed a much greater rate of publication than prior to the war. This mirrors the worldwide increased rate of publication in general for all subject and geographic areas. Of all the holdings in *PolarPac2,* 77.6% were published from 1965-1989. In other words, out of every 10 polar monographs, 7.7 of them were published since 1965.

Since the *PolarPac3* database was significantly larger than PP2, it might be surmised that the distribution of publications by date might show a shift in pattern. This did not prove to be the case. From the time period of pre-1900 to 1969, the publication pattern is almost exactly the same. In the period 1970-1979, the first deviation appears with a slightly smaller percentage of publications being published in 1970-1979. The period 1980-1989 showed a significantly greater number of publications being acquired for the that time period. Since the base of comparison remained the same for Alaskan libraries (University of Alaska Fairbanks, Alaska State Library, Alaska Resources Library), one possible

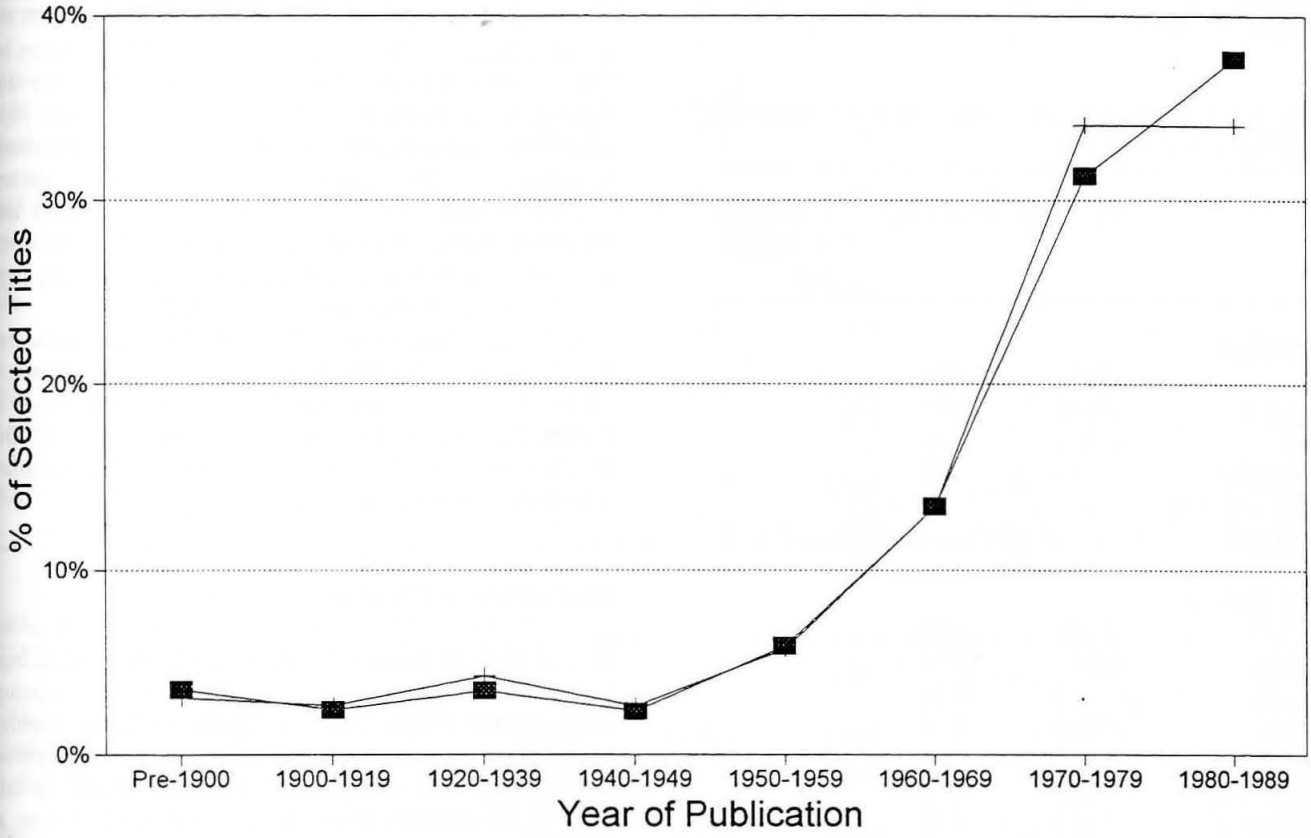

Fig. 3. Subject comparison, *PolarPac2* and *PolarPac3* 1990-1993

interpretation is that the two libraries new to the database, SPRI and INA, are adding to their libraries at a higher rate than the Alaskan libraries are for the same time period.

Subject coverage of *PolarPac*

Subject analysis of *PolarPac2* and *PolarPac3* covers the monographic holdings of: the University of Alaska Fairbanks; Alaska State Library; Alaska Resources Library; Scott Polar Research Institute; and, Indian and Northern Affairs Canada. Analysis of *PolarPac2* showed that the greatest number of titles was held in the area of geology and earth sciences. 14 945 holdings were reported here which constituted over 20% of the database. The next largest area of concentration was history and auxiliary sciences which had 9924 holdings. The other areas of high concentration were business, agriculture, biology, and engineering/technology.

While containing literature of all disciplines, *PolarPac3* was a deliberate attempt to increase the social science and humanities holdings of the database. Much of the literature of the northern social sciences is grey in nature and relatively difficult to access. Insufficient attention had been given to those areas such as aboriginal rights and the power that knowledge and information can give to the native peoples of the north. Perhaps the best documented field is historical exploration--but even here much of the work is dependent upon original sources whose locations are unknown or known only to a few scholars.

With a grant from the U.S. National Endowment for the Humanities, *PolarPac3* sought to augment these areas. The authors focused on libraries whose holdings would expand literature in the humanities and social sciences internationally. For this reason, the two libraries targeted were the main library of the Department of Indian and Northern Affairs Canada in Ottawa and the Scott Polar Research Institute, at Cambridge University in Cambridge, United Kingdom. It was in the analysis of these two libraries holdings that the most interest was focused in looking at PolarPac3's database.

Fig. 3 shows the result of a comparison between the two databases. Due to the large increase in the total number of titles in *PolarPac3*, it is to be expected that there were be large increases in the number of titles in each category. It might also be expected that the distribution of holdings might change due to the specialized nature of the collections at SPRI and INA. However, Fig. 3 shows that this is not the case. The subject areas of heaviest concentrations in *PolarPac2* simply became even more concentrated in *PolarPac3*.

The areas of heaviest concentration are geology/earth sciences, history, engineering and technology, business, biology, and agriculture.

Table I. Comparison of broad subject categories, *PolarPac2* and *PolarPac3*

	PolarPac3	PolarPac2	% increase in database size
Humanities:			
Art	4126	844	
Lang & Lit	8638	4255	
Music	224	81	
Philosophy	993	514	
Performing Arts	106	45	
Subtotal	14087	5739	245.5
	7.8%	7.9%	
Social Sciences:			
Anthro	1765	346	
Business	18611	6596	
Education	3123	1545	
History	27765	9924	
Law	3960	1557	
Library Science	3175	804	
Physical Ed.	1934	907	
Political Science	4781	1938	
Psychology	209	59	
Sociology	6075	2149	
Subtotal	71398	25825	276.5
	39.4%	35.5%	
Sciences:			
Agriculture	15525	6639	
Biology	17918	7159	
Chemistry	282	150	
Computer Science	509	101	
Geology/ Earth Sci	33966	14945	
Math	584	345	
Medicine	1837	734	
Physical Science	3379	2021	
Engineering	21896	9071	
Subtotal	95896	41165	233.0
	52.9%	56.6%	
TOTALS	181381	72729	249.5

Does this mean that the stated purposed of *PolarPac3*: to increase the holdings of the humanities and social sciences was not accomplished? A closer reading of the subject analysis is needed to answer this question. Looking at individual subject division as given in Fig. 3 above would seem to give the answer that the goals were not accomplished. However, when the subject divisions are recombined into the greater subject divisions of: humanities, social sciences, and sciences, a slightly different answer is presented. Table I shows the results.

Overall, *PolarPac3* increased size by 249%, with the social sciences increasing by 276% and the sciences by 233%. This does not mean that the sciences are less significant in *PolarPac3*, they still make up the most significant percentage of titles in the database. However, the social sciences have gained disproportionally through the addition of Indian and Northern Affairs Canada and Scott Polar Research Institute. The humanities remain a very poor third, even with their rate of increase in *PolarPac3*.

This subject division of library holdings has remained the same since the first investigation of polar literature (West 1992). Based upon the data retrieved in *PolarPac3*, one might reasonably postulate that this division reflects the research activities and resultant output of literature among polar scholars.

Duplication of collections

One concern of many information professionals, at least in the United States, is the duplication of collection development efforts. That is, libraries serving clientele working in similar areas are duplicating acquisition, cataloguing, and storage of monographs and serials. One of the primary motivations for *PolarPac1* was an attempt to seek out such duplication and find ways to cooperate in collection development. Is this indeed the case in the area of polar libraries?

It was decided by the authors to conduct a monographic title study to determine quantitatively what was occurring among the four major libraries in *PolarPac3* in terms of collection overlap. The monographic holdings analyzed were: the University of Alaska Fairbanks; Alaska Resources Library; Scott Polar Research Institute Library; and, the Indian and Northern Affairs Canada Library. The results, given below in Table II, were quite surprising.

PolarPac3 contained 172 675 total monographic titles. Of these, 147 661 were unique titles, meaning only one of the libraries reported owning it. Of those, UAF had 66 540 unique titles; ARL had 10 446 unique titles; SPRI had 13 122; and, INA had 33 690 unique titles. Thus these four libraries together represent almost 84% of all the unique titles in *PolarPac3*.

Analysing the data further, we find that UAF shared 12 918 titles with ARL, shared 3475 titles with SPRI, and shared 9206 titles with Indian and Northern Affairs Canada. Overall, we then find that the highest rate of duplication is between UAF and ARL which shared only 14.4% of its titles. It would appear, at least in *PolarPac3*, that the rate of duplication between libraries is not significant.

A more detailed analysis looked at the title overlap for the two largest subject concentrations in *PolarPac3*: geology/earth sciences, and history. Beyond the high

Table II. *PolarPac3* Title overlap report

	UAF	ARL	SPRI	INA	
Total no. of unique titles in PP3					147661
Total no. of titles in PP3	89630	23747	17112	43569	
% of unique titles against total titles	60.7	16.1	11.6	29.5	
UAF	66540	12918	3475	9206	
	74.2	54.4	20.3	21.1	
ARL	12918	10446	654	1542	
	14.4	44.0	3.9	3.5	
SPRI	3475	654	13122	1292	
	3.9	2.7	76.7	3.0	
INA	9206	1542	1292	33690	
	10.3	6.5	7.5	77.3	

Table III. Title overlap--geology & earth sciences

	UAF	ARL	SPRI	INA	
Total no. of unique titles in PP3					24351
Total no. of titles in PP3	13356	5453	7764	3283	
% of unique titles against total titles	54.8	22.4	31.9	13.5	
UAF	8678	2797	1378	1131	
	65.0	51.3	17.7	34.4	
ARL	2797	2566	258	249	
	20.9	47.1	3.3	7.6	
SPRI	1378	258	6224	354	
	10.3	4.7	80.2	10.8	
INA	1131	249	354	2013	
	8.5	4.6	4.6	61.3	

Table IV. Title overlap--history & auxiliary sciences

	UAF	ARL	SPRI	INA	
Total no. of unique titles in PP3					19459
Total no. of titles in PP3	10897	1636	1925	9359	
% of unique titles against total titles	56.0	8.4	9.9	48.1	
UAF	7224	1112	750	2413	
	66.3	68.0	39.0	25.8	
ARL	1112	503	118	272	
	14.4	44.0	4.0	3.5	
SPRI	750	118	1106	353	
	6.9	7.2	57.4	3.8	
INA	2413	272	353	6870	
	22.1	16.6	18.3	73.4	

Table V. *PolarPac3* libraries sharing titles

	Unique	2 libraries sharing a title	3 libraries sharing a title	4 libraries sharing a title	Totals
Totals	123798	21485	2222	156	147661
UAF unique titles	66540	20737	2197	156	89630
% of all unique titles	53.7	96.5	98.9	100.0	60.7
% unique to UAF	74.2	23.1	2.4	0.2	
ARL unique titles	10446	11644	1501	156	23747
% of all unique titles	8.4	54.2	67.5	100.0	16.1
% unique to ARL	44.0	49.0	6.3	0.7	
SPRI unique titles	13122	2715	1119	156	17112
% of all unique titles	10.6	12.6	50.4	100.0	11.59
% unique to SPRI	76.7	15.9	6.5	0.9	
INA unique titles	33690	7874	1849	156	43569
% of all unique titles	27.2	36.6	83.2	100.0	29.51
% unique to INA	77.3	18.1	4.2	0.4	

numbers, we used these two subject areas for detailed analysis because it was believed that SPRI would be especially strong in geology/earth sciences (this area includes ice, glaciology, etc.) and INA would be especially strong in history since it contains the subject category of native peoples.

Table III shows the title overlap for geology and earth sciences. There were a total of 24 351 unique titles in this area. UAF had 8678 unique titles, ARL had 2566, SPRI had 6224, and INA had 2013. Considering the total number of unique titles SPRI has in *PolarPac3* (13 122), 6224 unique titles in this area indicates a high degree of concentration. This can be interpreted to mean that, while SPRI's collection is not large enough in sheer numbers to impact upon the overall subject division, it is a library that is narrowly defined, but especially deep in its definition. More importantly in terms of collection development duplication, SPRI and UAF duplicated no more than 1378 titles. Out of 24 351 titles, this is statistically insignificant (5.6%).

Table IV shows the title overlap for history and auxiliary sciences. There were a total of 19 459 titles in this area. UAF had 7224 unique titles, ARL 503, SPRI 1106, and INA 6870. Clearly, since INA had 33 690 unique titles in total, this area was not nearly so highly concentrated for them as geology/earth sciences was for SPRI. While these titles represent a uniqueness factor of 73.4% and thus important to the literature of aboriginal peoples, it does also reveal INA to be a more broadly developed collection than SPRI. Between any two libraries there were no more than 2413 duplicative titles (UAF and INA). Out of the 19 459 total for unique titles in this subject division, this represents a duplicative factor of only 12%.

Titles shared among polar libraries

We were then interested in knowing just to what degree these four libraries are sharing titles. We ran an analysis of title sharing without regard for subject categories or divisions. Table 5 reveals what we found.

Two factors should be noted. Each library was measured in terms of its uniqueness contribution to the *PolarPac3* database. Then, each library was analyzed in terms of its uniqueness within its own holdings. For example, UAF has 66 540 unique titles. This constitutes 53.75% of all titles in the *PolarPac3* database. It constitutes 74.24% of UAF's total holdings.

While SPRI and INA did not contribute large numbers of titles to the database, contributing only 10.6% and 27.21% respectively, what they did contribute was remarkable and broadened yet again the database content. SPRI contributed 76.68% unique records and INA contributed 77.33%.

Further reading of the data shows that, in the end, these four libraries share ONLY 156 TITLES in common (0.1%). This is simply astounding. These four libraries have been active for some time in polar collection development. Over time, they have been well-funded (with extreme fluctuations) and able to collect aggressively. While not sharing a common mission, they are clearly working in similar areas, serving similar, and, sometimes shared, polar researchers. Anecdotally, we sometimes joke at UAF that we are part of the UAF-SPRI shuttle because of the many researchers we share. Yet, the collections are not duplicative to any real degree.

Conclusions

This data suggest strongly that increasing additions of diverse libraries to the *PolarPac* database will not change publication pattern distribution in terms of age of publication or subject distribution. This corresponds to what many of us who work and live in the polar regions know: that the development of natural resources began in earnest in the 1970s and development has lead to publication. We also know that, because of the type of development, most of the research has been done in the sciences, with some work in the social sciences. It is the authors' theory that this pattern will not significantly change as we add the holdings of Russian libraries in *PolarPac4*.

What is much more surprising is that there is so little collection duplication between the four major libraries analyzed. This suggests that discussions that aimed at exploring ways of preventing duplicative collection development are not necessary; little is occurring in any case. We believe that this pattern will also not change with the addition of libraries in Russia. If anything, this diversity of collections will be accentuated.

This suggests that what is needed is much more work on sharing of collections to meet the needs of our scholars and researchers. The existence of *PolarPac* has shown where the information is located--now the challenge for polar libraries is to develop ways of sharing the actual document quickly and inexpensively.

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Conversion of the Cold Regions Bibliography

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Extended Abstract: In the two years since the last Colloquy the Cold Regions Bibliography has been converted to a commercial software called STAR, which has a proven record as a powerful and versatile database management system. The existing database has now been copied from its MARC format into STAR records with equivalent fields, and a new entry form has been designed for future citation input. STAR also includes the FrameMaker desktop printing software which will compose camera-ready copy for production printing. After database definition and software debugging, the full file of some 180 000 records has been copied into STAR in the host Sun computer at the Library of Congress, where it may be accessed over Internet. The paper discusses some features of the database design, and gives examples of data entry and search methods.

As publications on cold regions research continues to grow, there has been increasing concern in the polar libraries community about duplicate indexing of sources, notably journal articles; several of the 15th Colloquy papers addressed this question. Furthermore, given the fact that almost half of the Cold Regions Bibliography comes from non-English sources, it would seem useful if we could have indexing effort from other countries having their own polar publications, and thus share out the responsibility for the coverage on an international basis. This should also be a more efficient way of capturing the grey literature world-wide.

Now that the Cold Regions database will be online and available everywhere via the Internet, we have the technical capability to disseminate the indexing as well as providing search access; the Cold Regions staff will be inputting records via Internet, and others could do the same from any Internet node. As a first step in joint indexing, SPRI and the Cold Regions Project have agreed to collaborate on inputting of Antarctic records in the bibliography, and this plan has received the approval of the CRBP sponsors. William Mills spent a week last March working with CRBP staff in our Library of Congress offices, and I have spent the week after the Colloquy at SPRI to introduce staff to the database in STAR, mainly on the indexing practices, as well as to discuss our joint strategy for sharing the Antarctic indexing in future.

As a start we propose to select some Antarctic journal titles which we both routinely index, and have SPRI staff enter them using STAR record format in a separate STAR file. Those journals will be available at LOC, so original articles can later be married to their indexed STAR record for proofreading and microfiching. The edited SPRI records will be added to the current STAR monthly file for printing, and then go into the permanent database. Every such journal that SPRI will do is one less for CRBP staff, so a substantial increase in indexing efficiency should be realized. Furthermore, any such records could be downloaded and changed from STAR to any other format desired; users are free to copy and alter STAR records at will.

In addition to sharing the Antarctic journal indexing, SPRI can provide valuable input in the area of Antarctic grey literature, notably from Australia and New Zealand as well as other European sources; we have long recognized this as an area in which the Cold Regions database is deficient.

SPRI thus now becomes a formal partner in producing the Antarctic portion of the Cold Regions Bibliography, and should be so acknowledged. Provided that consistency of indexing practice is maintained, we see no reason why this effort could not extend to other countries as well, thus making the Antarctic Bibliography a truly international publication.

Icelandic research libraries in the natural sciences and the library computer system Gegnir

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Abstract: The Icelandic National Library and the University Library in Reykjavik will be consolidated into one library in 1994. A computer library system, Gegnir, which has been used by the National Library, the University Library and six other smaller libraries since 1991, will be used for cataloguing, circulation control and on-line searching by the new library. Gegnir now contains an Icelandic National Bibliography from 1970, a catalogue of foreign holdings of the National Library and the University Library, a union catalogue of foreign periodicals in Icelandic libraries and a bibliographic database of articles in Icelandic periodicals. A number of small Icelandic research libraries in the natural sciences plan to use Gegnir as a union catalogue in order to make cataloguing information of each library available to other libraries and to other users of Gegnir. The centralised cataloguing will benefit all users of natural science libraries in Iceland, reduce duplication of effort between these small libraries and greatly increase the usefulness of the information in the libraries to the scientific community in Iceland.

Key words: Gegnir, library systems, Iceland, natural science libraries, research libraries.

Introduction

A number of Icelandic research institutions in the natural sciences run small research libraries with a few thousand scientific books and a number of scientific periodicals which are necessary for the research work of the scientists at the institute. The staff of each library usually consists of only one librarian and possibly a part-time secretary. This situation has lead to co-operation between the libraries in order to co-ordinate the acquisition of scientific periodicals, exchange information about cataloguing and identify other areas where co-operation is useful. The librarians meet regularly to discuss common problems and share experience.

The installation of the computer library system Gegnir (Libertas) at the National Library of Iceland and the University Library in Reykjavik has opened the possibility to computerize and centralize the cataloguing of these small research libraries and make the holdings of each library available for on-line searching to users of the other libraries and to other scientists and students with access to Gegnir. This will reduce duplication of effort between the libraries and facilitate effective specialization of the library of each research institute. The scientific periodicals of the research libraries have already been catalogued in Gegnir and a pilot study which was limited to a part of the scientific books has been carried out. The cataloguing of the rest of the scientific books and other scientific material is in the planning stage.

This paper describes the libraries of Icelandic research institutions in the natural sciences and the library system Gegnir which will be used to maintain a union catalogue for the libraries. The paper starts with a brief description of each institution and its library. The new possibilities offered by Gegnir are then described. Finally, the paper gives information on how to connect to and perform searches in Gegnir.

Natural science libraries in Iceland

The five largest research institutes in the natural sciences in Reykjavik, which run their own libraries are: The Icelandic Museum of Natural History, the National Energy Authority, the Marine Research Institute, the Agricultural Research Institute and the Icelandic Meteorological Office (Finnbjornsson 1990, The World of Learning 1993). The largest natural sciences library in Iceland is a part of the University Library in Reykjavik and will not be described here.

The libraries are open to the public, although they are first and foremost supposed to serve their institutions. Most of the Icelandic research libraries are connected to the Internet and it is possible to contact the librarians via e-mail. It has also become common to use e-mail for ordering articles and publications from other libraries. The libraries are all connected to the library system Gegnir.

The Icelandic Museum of Natural History
A research institution which conducts basic research in zoology, botany and geology, maintains comprehensive scientific collections of natural history objects and organizes exhibitions representing Icelandic nature. In zoology, most emphasis is laid on bird ringing, breeding distribution of Icelandic birds, seabird colony register and a checklist and distribution of Icelandic terrestrial invertebrates. In botany, the scientists of the institute are working on distribution maps for Icelandic vascular plants and bryophytes and a checklist of Icelandic vascular plants. In geology, most emphasis is laid on geological mapping, and research in the petrology and the mineralogy of Iceland. Increasing effort has been put into environmental research and environmental assessment in the recent years. The Icelandic Museum of Natural History participates, on behalf of Iceland, in the project "Conservation of Arctic Flora and Fauna", which is part of the "Arctic Environmental Protection Strategy". This library was founded in 1983, almost 100 years after the Museum itself was established, The main subjects are: mineralogy, petrology, vascular plants, bryology, ornithology and entomology. Holdings are 7000 books, 500 current periodicals, 2000 maps, mostly geological, and 26000 reprints, mainly scientific studies of Icelandic nature.

The National Energy Authority (NEA)
NEA advises the Icelandic government on energy policy and performs research and planning commensurate with satisfying the nation's energy needs, whilst ensuring the most economical utilization of available energy resources. It works closely with the energy utilities developing the geothermal and hydropower potential of Iceland. It also markets various services in energy research and exploration of geothermal areas and potential hydropower sites both at home and abroad. A Geothermal Training Programme, jointly sponsored by the Government of Iceland (80%) and the United Nations University (20%) is run by the Geothermal Division of NEA. The holdings of the library of NEA are 10 000 books, 220 current periodicals and a collection of reports concerning research results. Specialization: geology, geochemistry, hydrology, energy resources and engineering technology.

The Marine Research Institute
Its primary objective is to obtain knowledge of the sea around Iceland and its living resources. Research is carried out in most disciplines of modern oceanography, i.e. physical and chemical properties of the sea, morphology and nature of the sea floor, environmental conditions and life history of algae, zoo plankton, benthos and fish. Studies in mariculture have recently been initiated. The greatest effort is, however, put into research relating to the exploitation of marine resources, including analysis of stock sizes and recommendations of catch quotas. The Marine Research Institute runs the Fisheries Library in co-operation with the Icelandic Fisheries Laboratories. The holdings are: c. 18 000 books, 800 current periodicals and 20 000 pamphlets/reprints. The main subjects are marine biology, marine geology, fisheries and oceanography.

The Agricultural Research Institute
The main objectives of the Institute are to acquire new knowledge and apply it in agriculture, to promote profitable agriculture without land impairment, to enhance utilisation of locally produced feeds, to improve the quality and variety of farm products and to increase their market share. The library emphasises scientific journals, but few books. The library holdings are 3700 books, 520 periodicals, 120 vegetation maps of Iceland, and reprints. The main subjects covered are: animal nutrition and breeding, aquaculture, environmental ecology, erosion control, land use and reclamation, soil erosion mapping, biotechnology, plant protection, plant pests and diseases, agronomy and cytogenetics.

The Icelandic Meteorological Office
The Office provides meteorological services for Iceland and surrounding ocean areas and carries out research in meteorology and other related fields. It participates in international activities connected with North Atlantic meteorology and the World Meteorological Organisation. It is also involved in seismological research, alerts the authorities to avalanche dangers, and collects data on sea ice. The library holdings are 10 000 books, 430 current periodicals, 120 microforms and a collection of reprints in seismology and meteorology.

The library system Gegnir

The Icelandic National Library and the University Library in Reykjavik, which will be consolidated into one library in 1994, installed the computer library system Gegnir in 1991 (Ragnarsson 1993). The system, which consists of several modules, is currently used for cataloguing, circulation control, acquisitions and serials control and for on-line searching. The system can also be used to transfer bibliographic records from the international database OCLS directly into the MARC-format used by Gegnir. The word Gegnir has a double meaning in Icelandic: firstly, something that is useful, and secondly, someone that obeys. Gegnir comes originally from SLS Information Systems in Bristol, UK, where it is call LIBERTAS (Leeves 1994). It is used as a library system in about forty libraries in Great Britain, Sweden and Spain. Gegnir runs on a Micro-VAX 3900 from Digital Equipment Corporation.

Gegnir is first and foremost the library system of the University Library in Reykjavik and the National Library of Iceland, with unlimited possibilities for other libraries to join. Smaller libraries which currently use Gegnir are the libraries of the Icelandic Teachers College, the

Central Bank of Iceland, the National Museum, the Arnamagnaean Manuscript Institute, the Icelandic Parliament and the Woman's History Library. The libraries are now in the process of cataloguing their holdings in Gegnir and some work remains to be done before this is completed. Gegnir contains a catalogue of the foreign holdings of the National Library and the University Library and the Icelandic National Bibliography from 1970. Gegnir also serves as a union catalogue for Iceland. Currently, foreign periodicals in about 60 Icelandic Libraries are catalogued in Gegnir and in the future a union catalogue for books in at least Icelandic research libraries will be maintained there as mentioned in the previous section. Gegnir, furthermore, contains a bibliographic database for articles in Icelandic periodicals. Only articles from a few periodicals have been catalogued so far, but this includes the most important periodicals in the natural sciences. At present the database contains about 300 000 records.

The union catalogues maintained in Gegnir will link the Icelandic libraries which participate in the system and enable library customers to make much more effective use of the libraries through inter-library loans. New possibilities for co-operation and specialization which are introduced by Gegnir are especially important for the small Icelandic research libraries which will be able to plan their acquisition of books and periodicals more effectively when their holdings are available in a common union catalogue to all users.

On-line searching in Gegnir

Gegnir makes it possible for librarians, scientists and other potential users to quickly obtain information about books and other holdings of libraries in Iceland. This will be particularly useful for humanists studying Icelandic literature and culture and scientists who need information about icelandic nature.

Gegnir can be accessed remotely through the Internet (saga.rhi.hi.is), X-25 (274011723010) and over modem (+354-1-694748). Apart from communications costs, remote access of Gegnir is free and open to any Icelandic and foreign users who have access to Internet, X-25 or a modem.

Searches in Gegnir are menu and command driven. The system offers the choice of eight languages in addition to Icelandic. A booklet in English describing the use of the system is available from the University Library in Reykjavik. Many Icelandic entries in Gegnir contain 8-bit characters and it is therefore advantageous to use computer equipment which is capable of entering and displaying 8-bit information. In the absence of such equipment, users may enter alphabetic keywords (indices) as close to the desired letter as possible and browse on as needed. Searches in Gegnir are of three main types: keyword searches, browsing in alphabetical or numerical lists, such as author, title or Dewey index lists, and Boolean searches. Icelandic names are catalogued and arranged first by given name and then by surname, but non-Icelandic names follow the general cataloguing rule - surname first and then given names. Subject headings are almost the same as used in Library of Congress cataloguing.

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Full-text Arctic databases: the tool, the methodology, the research potential

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Abstract: Full-text, indexed, databases such as the Hubert Wenger Anthropological Eskimo Database, have several profound applications. As the number of computer scanned pages grows by the tens of thousands, questions of database design and access strategy become increasingly important. A hybrid system using elements of computer word indexing, controlled vocabulary indexing, and hypertext techniques provide a variety of tools for the end user to use to navigate within a large database, through the use of Boolean logic. The use of a standard, such as SGML, makes the sharing of information across databases and a variety of computer platforms feasible. It also makes the data independent of whatever software is currently utilised to display it. The Internet provides an alternative delivery system to CD-ROM.

Key words: CD-ROM, Eskimo, full-text database, SGML

Introduction

The power of a full-text database is that it is location independent and can be searched in ways that are not practical in a traditional, manual, way. Connections can be made throughout a body of literature. Much of this is true of a well constructed bibliographic database as well, of course, but in a fundamentally different way. A bibliographic database points to other objects, which must be retrieved to be used -- fetched from the shelf. Even hybrid systems with electronic retrieval, for example large commercial databases such as ABI-INFORM, include journal articles stored separately as images on numerous CDs, a kind of electronic microfilm. With a full-text database, we have direct access to the works themselves -- the published word and photograph.

As a full-text database grows in size, the question of how to provide navigational tools to the end user become more pressing. No system designer could possibly foresee all of the variety of ways the database could be queried. In what follows, I will explore some of the alternative access methods available to us, discuss our implementation of them, and finally pose some alternatives for future developments -- both within and beyond the Wenger project itself.

Search tools

Hybrid search system

What we have worked to develop is a hybrid system, which takes functions from several methodologies. It brings together the expertise of human subject specialists with the ability of the computer to count, store, and retrieve words in a variety of combinations. The trick is to provide the tools for a researcher to limit the information that they retrieve to digestible portions, hopefully the most relevant information for their purposes from a great mass of text. At present, the Wenger Disk I contains 200 publications, with 4 693 645 words that the computer maintains a location for in its index.

The first step is the selection of material in the database. It is focused. It emphasises first contact literature about Eskimos. It is not about Arctic ecology, although there is some useful information there; it is not about archaeology, although someone with that interest would find this to be useful co-lateral information; it is not about issues of acculturation, although this database literature would be an essential part, but only one part, of such a study. Dates of publications vary considerably, and we have had excellent co-operation from both authors and publishers in the granting of copyright permissions for those works still under copyright for inclusion within the database.

The second step to bring some control over this information is to treat it as units. The term we will use for them is "object". An object is either an image from the publications indexed in the database, or a parcel of text (usually one chapter or a sub-chapter) from a publication that has a theme or general subject. Thus a search would give the user a list of book chapters and images, all labelled and identified, that could then be examined. Once within a text object, a user can go directly to search words within the chapter itself through a "zoom" function if desired. The current database contains 7922 objects, 3000 of them images, and the remainder text. Thus through the use of objects, the 4 693 645 possible locations within the database are brought down to slightly less than 8000.

A third tool provided for the user is the ability to choose publication by author and title. Any author or group of authors may be included or excluded in a search. This leads us to the fourth tool which is in many ways the most important: assigned subject terms.

In its earliest form, this database was a manual card system which was an extension of book indexes to many works. Hubert Wenger developed this from his knowledge of manual systems for handling military intelligence and from a number of years of thought about the matter. He became convinced that computers could vastly improve and extend this system, and he began to actively pursue this in the late 1970's. His first system utilised an IBM DisplayWriter and a subject code system that he had developed from his earlier work to access what he had typed in.

The advent of functional computer scanners and the increasing memory capacity that dwarfed that of the DisplayWriter, allowed us, at the Rasmuson Library (funded by donations by Hubert and Beatrice Wenger of Mies, Switzerland), to begin the further development of Hubert's system that we have today. It also allowed us to scan and retrieve images. Hubert had spent many laborious hours photographing and mounting enlargements of illustrations for a manual subject access system. Increased computer capacity allowed us to spell out the terms, rather than use codes, which is much easier for a user to master. Hubert, himself, developed the first version of the subject terms, entering them into a dBase program and sending them to us on disk. Today, indexers, with a knowledge of anthropology and its terminology, assign subject terms to each object from a controlled vocabulary of terms. This allows the user to search for images or text passages that substantially discuss a particular term, and not those in which a term may simply be utilised in an incidental manner.

In addition to subject terms, indexers identify which of the twenty-one population groups are treated in each object, as appropriate. These are the major cultural divisions c.1825, as identified by Tiger Burch and used with his co-operation. If more than one group is discussed within a document, each group may be accessed by name, both individually and in combination with the others listed.

Boolean logic

The ability to precisely define a search within a large database is what makes it all possible. The database will search for words in relationship to each other, such as words adjacent to each other, words occurring in the same sentence, words occurring within the same paragraph, or words appearing anywhere within the same object. This can then be combined with a search that includes or excludes certain populations, includes or excludes certain assigned terms, and so on. There can be up to nine complex Boolean search arguments operating at any one time, each building on the others. There are several examples in our Search Manual that illustrate how this functions.

Without such a system, the user would be nearly helpless. Certain themes, such as housing, transportation and hunting techniques are treated again and again in the literature. One would obviously not use the term "Eskimo" as a search word in a database about Eskimos, but the word appears 46 001 times within the database (and its closest variant "Esquimax" 1400 times. The word "ice" occurs 18 732 times, "iceberg" 422, "snow" 10 681 times, "seal" 14 082 times, "caribou" 9005 times (not counting the variant names given these animals by various authors).

This allows us to look at the literature in a new way. Not only can we use these tools to find out about what was written on certain topics in a precise way, but we can also begin to analyze the literature itself. What were these authors interested in? What did they write about most often? How does the treatment of a particular topic vary through time? What can this database tell us about the world view and the interests of these observers?

Hypertext

Yet another common method of developing databases has been made popular in the Apple computer world: hypertext. This is, in its most essential elements, a system of linkages that form a complex web of connections within a hypertext database. The real strength of a hypertext system is in presenting a defined body of information to a user, such as an on-line encyclopedia. Thus, if one were to design a database to teach students about the Arctic world, there might be a general discussion of wildlife. Clicking with a mouse on "polar bear" would bring up a definition of the term, along with the possibility of access to other media, such as sound and/or video clips. Fascinated by how the bear hunts, a student then might click on the term seal, to learn more about the bear's prey -- and so on through the database. This methodology is very seductive. It looks impressive, and it is relatively easy to develop a convincing demonstration project. However, it takes an immense amount of labour to create a large hypertext database and many a fond dream has faltered on the enormous cost involved in creating such a thing. There are some success stories, such as Will Schneider's Project Jukebox, in which the investment has paid off through a lot of hard work.

We will take only a couple of elements from the Hypertext world. First, for this next disk, we will link all of our illustrations to the place that they occur in the text. The user will still be able to search and view images entirely separate from the text if they so wish. We will explore adding an on-line help system that will include hypertext within the help system itself. We can also enhance our table of contents system that we used with our test CD, but that had grown too large for the software on Disk I to handle. The real advantage of hypertext could come with the version beyond Disk II (we will call it Disk III), when we will be able to link place names to a gazetteer with map locations, if we decide that it is feasible option. It would certainly take a lot of labour to prepare.

Windows environment

The next version of the Wenger database, Disk II, will be done under the Microsoft Windows platform instead of straight DOS. It will enable us to add some additional functions to aid the user in utilising the information that this database, which will contain as many as 100 additional works, has to offer. It will allow us to place multiple information elements on the computer screen at one time, something that the software on Disk I will not allow. Thus two texts can be directly compared, or a text with an image that was originally published with the text can be displayed at the same time, or two or more images can be directly compared, or any combination of all of these is possible. The handling of images will be greatly enhanced. The user will be able to enlarge and shrink images at will and images can be linked together. This will allow us to scan selected images at a greater resolution, and to link multiple images together.

Future possibilities

New access methods, new software, and new ways of sharing information between databases provides us with an interesting set of possibilities for what would be Disk III and beyond.

The promise of SGML

SGML (Standard Generalised Mark-up Language) is an international standard first adopted in 1986. It is a system or format for encoding text that is independent of any particular computer system or computer software. Not only can a text be shared between systems, but prepared text can migrate from one software system to a more advanced version without any re-coding or special preparation. SGML text is basically plain ASCII text with codes (based on TEI -- Text Encoding Initiative -- standards). It dictates how the text should appear (which fonts, how formatted); contains elements that describe the text (which language, subject descriptors; and may have pointers to other material (hypertext links to multimedia such as other text, images, video or audio clips or even other databases). SGML has been adopted by a number of large agencies to manage their technical manuals. Boeing Aircraft uses the system to manage its world-wide technical support and the U.S. military has mounted a major program to put its technical manuals on-line (a typical U.S. warship will carry between 25 and 50 tons of paper manuals to support its weapons systems). SGML has also been the principal system employed for a growing number of co-operative projects in the humanities, involving such things as Greek texts, the entire corpus of Old English documents, and Dante's texts along with the critical scholarship concerning these texts which spans 600 years.

To the extent that other databases employ SGML or can be made to be compatible with it, the end user could access co-lateral information that would be helpful in their work. My vision of the most desirable development of this would be that each database would retain its own integrity and identity. Thus database managers would worry only about their own, and not someone else's data. In addition, there are compelling reasons why each database must retain its own identity and its own standards for access.

However, it these issues can be worked out, and I have several suggestions of how we might start to work on this, the advantages to the user are substantial. Someone using the Wenger database might like to have access to some of the oral history stored in Project Jukebox or perhaps they would like to know as much as possible about what the weather was really like in 1832 and would like access to a collection on climatological data. A great deal of work has been done recently on place names in the Arctic, especially in Canada. On-line access to electronic gazetteers which contained not only the current, but also all known older and variant names as well, would be most useful.

Electronic access

Our CD will soon be full. The technology currently exists for enormously enhancing the storage capacity of this sort of technology, but it is difficult to tell if this will become commonly accepted to the extent that it can be used as a general system of distribution. Carousels with multiple CD's have become quite common in larger libraries (I have seen as many as 88 databases, many utilising multiple disks, available on-line within one large research library). One option is direct electronic access to the database.

Current technology allows low or no cost access to thousands of computer systems by millions of people. Right now large text tiles, library catalogues and image libraries can be accessed through the Internet. If database owners want, they can limit access to a database to a select group of users through passwords, just as we now limit distribution of the CD-ROM through use agreements. The technical advantages are many:

1. we can continually update the product without waiting for a major production date.
2. we can dispense with the special effort of re-compiling the database for CD-ROM pressing, which takes several months work and is technically challenging. We can avoid the cost of CD mastering, duplication and distribution.
3. we would not require special equipment on the part of our users beyond their own local access to the Internet. This means that we do not need to help our users install a complicated system at remote sites on a wide variety of computer equipment. This will also save valuable staff time. It is especially important as the database grows in size beyond what can be stored on one CD-ROM and as the display requires ever more

powerful machines, which our users may or may not have access to.

4. we can retain control over access to the database through use agreements.

The age of large-scale access to electronic text is upon us. There are a number of very large projects under way outside ofthe world of polar information, and many libraries, special libraries as well as large research and teaching libraries, are appointing specialised personnel to manage this and to provide coherent user access, not only within a building, but at a distance as well. It is up to us to utilise these developments to the best advantage of our users. Still, for an understanding of the subject, a user will need to do some reading in an organised fashion. A student would do well to select a basic text and read it from cover to cover in order to provide a context for understanding the bits and pieces that a database will let them access in whatever order they choose. Hubert's personal favourite is Edward Weyer's 1932 book *The Eskimos*, but others could serve the same purpose. The Wenger database will allow the user to read a complete book, chapter by chapter, with all of the illustrations. Or, once identified, there the user may want to sit down with the original paper copy in preparation for a fruitful hunt through the database to see what else has been written about topics of interest to the user.

Progress towards a Canadian polar information system

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Abstract: During the past two years some progress has been made on the development of the proposed Canadian Polar Information System (CPIS), but, as of June 1994, no funding has yet been identified to construct and operate the system. This paper reports on a study to choose formats for non-bibliographic records in CPIS, on the development of the CPIS subject and geographic thesauri, on a CPIS market analysis, on a bibliography and database on indigenous knowledge being prepared by ASTIS as a CPIS initial service, and on recent developments in the search for CPIS funding.

Key words: Canadian Polar Information System (CPIS), bibliographic databases, information systems, Canada, polar regions.

Introduction

This is the fourth Polar Libraries Colloquy at which we have reported on progress in the design and development of the proposed CPIS (Minion & Goodwin 1988, Goodwin & Minion 1990, Minion & Goodwin 1992a). During the past two years progress has been made in the CPIS system design, in the development of the CPIS thesauri, in the measurement of the usefulness of a CPIS to users, and in the creation of an indigenous knowledge database as a CPIS initial service. The past two years have also made it clear, however, that the ideal CPIS described in our 1991 report *Sharing Knowledge, Sharing Resources* (Minion & Goodwin 1991) will be very difficult to fund in the present Canadian economic climate.

CPIS developments

Non-bibliographic record formats

Our report to the 14th Polar Libraries Colloquy summarized the results of a study, funded by the Canadian Polar Commission, which chose descriptive indexing standards, a record format and display formats for bibliographic records in CPIS (Minion & Goodwin 1992b). During the past two years we have completed a similar study (Goodwin & Minion 1994), also funded by the Canadian Polar Commission, to choose record and display formats for the four proposed non-bibliographic CPIS record types: research projects, experts, organisations and numeric datasets. The size of the CPIS operating budget will determine which of the five record types are actually implemented.

The non-bibliographic formats study began by summarising the CPIS bibliographic format, and then identified a set of sixteen fields from that format that will be used in common by all five CPIS record types. Each of the four non-bibliographic record types was then examined in turn, beginning with a review of the fields used by other databases and directories of that type. Fields were selected for each record type, reusing previously defined fields when possible and creating new fields when necessary. An example of the display format for each record type was prepared.

Designing record formats for the four non-bibliographic CPIS record types added 11 new fields to the 32 fields created for the bibliographic format, making a total of 43 fields in the final CPIS record. All but six of the original bibliographic fields were reused in at least one of the non-bibliographic formats. As with other CPIS design studies, a group of fifteen participating information specialists from organizations with an interest in Canadian polar information reviewed a draft version of the study report.

The next step in completing the technical design of CPIS will be the selection of software and hardware for the system. Because software and hardware technologies are continually changing, work on the remainder of the CPIS design will not proceed until operating funding for CPIS is found and we are sure that the design can be completed and implemented without further delay.

Subject and geographic thesauri

Our report to the 14th Polar Libraries Colloquy mentioned that work had begun in 1992 on enhancing the ASTIS subject thesaurus to produce a CPIS Subject Thesaurus, and on simultaneously converting the subject terms in ASTIS records to use the new thesaurus. This work has been substantially completed over the past two years, as has a similar project to prepare a CPIS

Geographic Thesaurus. Funding for the majority of this work was provided by the Canadian Polar Commission during the period January 1992 to March 1993, with ASTIS continuing to work on the thesauri using its own resources since then.

Development of the CPIS Subject Thesaurus was guided by the ISO2788 thesaurus standards. The largest single task was the factoring of many of the pre-coordinated ASTIS subject terms into simpler component terms. This required turning all subdivisions into terms, and then breaking those terms that contained several concepts into single concept terms. Throughout this process all ASTIS records that used the affected terms were re-indexed as necessary. The BT-NT relationships that defined the thesaurus hierarchies were also checked and improved, many more USE references (non-preferred terms) were added, and scope notes were added or improved.

Most thesauri contain only "subjects", and not identifiers such as the names of people, organisations, expeditions, ships, etc. We decided that identifiers were essential to the indexing of publications in the polar social sciences and humanities, and that identifiers should be controlled and listed in the thesaurus rather than being treated as a separate uncontrolled part of the indexing vocabulary. Because most ASTIS records describe publications issued within the last twenty years, however, the identifiers in the thesaurus for historical figures and events are far from comprehensive.

As part of this project the ASTIS thesaurus management software was improved to allow keyword searching of preferred terms, non-preferred terms and scope notes; to allow the use of two types of USE reference (USE a OR b; USA a AND b); and to allow thesaurus terms to be tagged with broad subject codes so that they can be grouped by discipline for checking or display. The major remaining task of the thesaurus development project is to look at the terms discipline-by-discipline to see what further improvements can be made.

No printed versions of the CPIS thesauri are available at the present time, but the subject and geographic indexes of the 1993 microfiche ASTIS contain the thesauri as of February 1994.

A market analysis

Our survey of potential CPIS users (Goodwin & Minion 1991, summarized in Goodwin & Minion 1992) examined in detail what users wanted from CPIS in terms of content and services, but did not attempt to estimated how many people would use CPIS or what quantifiable benefits the system would provide to users. A study conducted for the Canadian Polar Commission in 1992 by Brian Pratt of Western Management Consultants provided answers to these two questions about the market for CPIS.

Working from preliminary estimates of usage across a number of sectors, Pratt focused his study on the sectors where greatest usage of CPIS is likely to occur - the federal and territorial governments, universities and northern native organizations. Rather than attempt to send questionnaires directly to a sample of potential users within these sectors, Pratt used a top-down survey method that attempted to reach every potential user in an organization. One survey package was sent from the Chair of the Polar Commission to a senior person in each organization (deputy ministers in government departments, vice-presidents of research at universities) with a request that the organization self-administer the survey to all of their staff doing northern research or analysis. This approach was very effective, with more than 60% of organizations responding.

The questionnaire was brief, asking how many person-years of northern research or analysis were being done, how useful a CPIS would be, and how much a CPIS would increase productivity. Organizations totalled the responses from their employees, and provided an estimate of how many of their employees were missed by the survey. In an unpublished report to the Polar Commission Pratt adjusted for missed employees within responding organizations, for non-responding organizations (based on the responses of similar organizations), for organizations not surveyed and for sectors not surveyed. He combined the estimates of person-years with the estimates of productivity increases to determine how many person-years would be saved, and then multiplied by average employee costs to determine the value of a CPIS.

The study concluded that a CPIS as described in *Sharing Knowledge, Sharing Resources*, and costing $1 500 000 per year, would provide Canada with $11 200 000 per year in increased northern research productivity. These results were used in subsequent approaches to the federal government for CPIS funding.

The CPIS initial service indigenous knowledge bibliography and database

While doing his market analysis, Brian Pratt of Western Management Consultants was told by potential CPIS users that they were impatient with the lack of action on CPIS. They had been hearing about the proposed CPIS for several years, but there was still no system to provide the information that they needed. Pratt recommended that a CPIS initial service or pilot project, using the existing ASTIS system, be created to provide information on one subject of current importance and to generate support for CPIS. The Canadian Polar Commission agreed with this recommendation, and after some deliberation, chose indigenous knowledge as the subject. The Commission provided funding to ASTIS from July 1993 to March 1994 to prepare a bibliography and microcomputer database on indigenous knowledge in northern Canada.

A detailed description of the scope of the indigenous knowledge bibliography was prepared with the help of an advisory committee of six indigenous knowledge researchers. Briefly, the project covers the traditional knowledge of the native peoples of northern Canada, including practical current applications of this knowledge in areas such as co-management of natural resources, traditional approaches to justice, etc. The project attempts to emphasize knowledge gathered with the active participation of indigenous peoples and tries to avoid becoming a bibliography of all of the anthropology and ethnology of northern Canada, although this line is a difficult one to draw.

When work on the project began, ASTIS, and the few indigenous knowledge researchers who were willing to venture a guess, estimated that the final bibliography would contain about 500 citations. Three internal drafts of *Indigenous Knowledge in Northern Canada: An Annotated Bibliography* have been produced by the project. The latest of these, in early April, 1994, contained 609 citations. ASTIS has continued to work on the bibliography since April using its own resources, and now has about 700 relevant citations in its database. ASTIS is working to obtain and examine a pool of about 300 additional publications that appear from their titles to be possibly relevant to the bibliography. This pool of unexamined citations does not adequately cover relevant French language literature, and probably does not include all relevant publications from native organizations. The current estimate is that there are somewhere between 1200 and 1400 relevant publications that should be included in the final bibliography.

A printed bibliography and microcomputer database will not be published until the project comes closer to comprehensive coverage of the relevant literature. Funding is currently being sought to resume the rate of indexing that was attained during the period of financial support from the Polar Commission. In the meantime, the citations in ASTIS are available through all of that database's normal products. Work done to mid-February, 500 citations, will be available on the next issue of *Arctic & Antarctic Regions* CD-ROM.

The search for CPIS funding

According to the Act of Parliament that created the Canadian Polar Commission, "The purpose of the Commission is to promote the development and dissemination of knowledge in respect of the polar regions" including "encouraging Canadian organizations, institutions and associations to support the development and dissemination of knowledge in respect of the polar regions" and "providing information about research in respect of the polar regions to Canadians and Canadian organizations, institutions and associations". It is widely accepted, both inside and outside government, that this Act gives the Commission the mandate to create the Canadian Polar Information System that was proposed in the 1987 federal report *Canada and Polar Science*, which also proposed the creation of the Commission.

Unfortunately the Commission's budget, while containing a small amount of money for CPIS design work, does not contain the significant amount of funding that would be needed to create and operate a comprehensive CPIS. During the past two years the Commission has attempted to obtain the necessary additional funding, both through the normal Treasury Board planning process and through a direct approach to the Minister of Indian and Northern Affairs. These efforts have so far been unsuccessful.

The Polar Commission's budget has been reduced by about 20% over the three years that it has been in operation. This fiscal year, April 1994 to March 1995, the Commission has decided to spend nothing on CPIS unless it can raise additional funding outside its present budget for this purpose. Work on CPIS has therefore come to a halt. We hope that this halt is a temporary one. We have not given up on CPIS, neither has the Polar Commission. We have, however, reconciled ourselves to the prospect of a CPIS that is much less ambitious in both scope and comprehensiveness than our original vision.

Acknowledgements

The authors would like to thank the Canadian Polar Commission for funding the work described in this paper. Special thanks to the Commission's chairman, Whit Fraser, and to the members of the Commission's CPIS Committee: George Miller, Marc-Adilard Tremblay and Lloyd Barber. We would also like to thank the many Canadian polar information specialists who have participated in CPIS design studies over the past six years. Their advice and encouragement have been essential to the completion of this work.

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Building a polar want list using the Internet

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Abstract: The ability to keep abreast of publications related to polar issues on an international scale can be slow and time consuming. Recent developments in international electronic communication provide opportunities for identification of desirable polar subject items which were not possible as recently as five years ago. This paper presents results of an experiment to determine the utility of using the Internet to compile a want list of desired monographs. The polar collections of the University of Alaska Fairbanks have known areas of subject weakness. A selection of subjects were searched in internationally available library catalogues on the Internet. Publications identified were compared to holdings of the Rasmuson Library to determine items not owned. Results of this process are reported together with time invested per identified desirable monograph. An evaluation of this process for collection building is included together with some discussion of its opportunities and limitations.

Key words: bibliographic records, Internet, Rasmuson Library, collection development, polar

Introduction

The Rasmuson Library polar regions collection has been built with a combination of depository items, gifts, and exchanges together with purchases of current and out of print materials. Government deposited monographs, gifts, and exchanges arrive at a more or less steady rate and constitute about 80-85 percent of newly acquired items per year. New publication purchases account for about 8 percent per year, with out-of-print purchases comprising the rest. Rasmuson Library may have made more effort to acquire out-of-print materials than some polar collections because of its relatively recent development, only getting seriously under way with the advent of the first Arctic Bibliographer in 1971. At that time the collection contained only about 5-6000 titles with content largely limited to Alaska and nearby Canadian regions. Twenty-three years later the geographic scope of the collection is much more international and it has about 90 000 titles.

This paper will focus on one aspect of Rasmuson Library's acquisitions effort: the attempt to acquire older out-of-print titles, to build retrospective aspects of the polar collection. In the past, desired titles have been identified in a variety of ways. These were: patron/user requests; dictionary catalogues of other polar collections; relevant subject bibliographies; and offerings of commercial out-of-print and rare book dealers. Obviously some of these have worked in combination. For example, patron requests, and titles from dictionary catalogues or bibliographies must be requested in want lists sent to out-of-print dealers.

Two decades ago, offerings by out-of-print dealers were very useful because the Rasmuson Polar Collection had many gaps and nearly every dealer catalogue would produce numerous monograph titles which could be purchased. Over time, this has gradually changed as more and more materials were obtained. For example, in the past year nothing was purchased from a dealer who specialises in English language books about Alaska; although ten years ago several titles were purchased from each catalogue listing. At present, the polar collection only occasionally acquires French Canadian books from one long time supplier because it appears that only the most uncommon items are absent from the collection. The collection appears to have thus reached a point of diminishing returns for effort expended in examining out-of-print catalogues from some of its most reliable and long standing suppliers.

At one time it seemed that the diminishing return per time expended meant that Rasmuson's polar collection had acquired nearly all the available polar literature in subjects of primary interest. However, evidence from a statistical comparison of unique holdings of several polar collections and reported at this meeting by Sharon West and Paul McCarthy (1994) indicates other possibilities. Their analysis suggests that extensive duplication of polar collections is not common. It may be that the universe of polar literature is much larger than most had imagined. Their results suggested that it might be fruitful to identify desirable polar monographs through examination of the bibliographic records of other polar collections and/or large national libraries.

This paper is a review of an initial attempt to see if the recent widespread development of the Internet could be used to build a wants list. A search of library literature in the ERIC educational database about Internet utilisation produced very few results. A review of abstracts to 195 Internet subject citations revealed that only one referred to collection development and upon examination was discovered to be irrelevant. Additional

review of library literature produced only one relevant article. M. C. Smith (1978) reported on similar work with electronic databases. He reported use of on-line data bases as a searching tool to identify citations for review and inclusion in the Antarctic Bibliography. Smith reported that a search of printed products which would require 15-18 hours to accomplish in a month, could be accomplished in 20 minutes a month. Additional literature for review regarding this subject would have been useful. Its apparent absence suggests that as the Internet expands to encompass libraries world wide more comparisons, similar to the one reported below, could contribute to changes in the traditional way that polar libraries have built their collections.

Methodology

To compare the time needed to build a listing of desired out-of-print titles utilising the Internet compared to time needed utilising dealer catalogues, the following time processes were assumed to be important enough to be compared:

a. time needed to connect with the computer system holding bibliographic records of another library,
b. time needed to learn how to find books by author, title, subject or key word using an unfamiliar software package of another library,
c. time needed to identify and download, print or write out unknown titles from such a library,
d. time needed to determine if such titles were missing from Rasmuson Collections,
e. report the time needed per title so identified,
f. compare this time with that needed for identifying unowned titles in out-of-print dealer catalogues to determine which procedure was most time efficient.

It also appeared useful to report to other potential searchers of the Internet, problems, difficulties, and successes of the effort.

In the beginning, a first attempt was made to search a wide selection of subjects or key words, but after one attempt, tactics were changed. It worked much better to decide in advance on selected subject words, such as caribou/reindeer or Inuit/Eskimo, and then use language dictionaries to determine the terms for these in the national language of library records to be examined.

This initial effort deserves to be reported - although it will doubtless not improve the reputation of the author! An attempt was made to find citations to books about reindeer/caribou in Finnish libraries without prior determination of the terminology in Finnish. The 39½ minutes utilising the same library software as that used at Rasmuson Library, resulted in no titles which could even be identified as associated with "reindeer".

There was one accidental success with the word" Eskimos" which led to identification of the correct Finnish word which in turn led to 19 titles in 9.4 minutes. Unfortunately no record of unowned titles was made and the search time on Rasmuson Library software was not recorded. Therefore, it can only be said that 19 titles were identified during a search of an unknown language, but known software, in a period of 51.5 minutes. It should be noted that 20.3 minutes of this time involved connect and disconnect time to Finland and the Lapin University catalogue records, together with three unplanned disconnects from the Internet system or the Lapin University catalogue.

To become more time effective in searching, relevant language dictionaries were used to properly identify correct subject terms in each language prior to going to the Internet. Experimental terms for this project were also limited to subject and/or key words. These were reindeer/caribou, Inuit/Eskimo, and the explorer Malaspina. Reindeer and Inuit appeared to have widespread international interest and it was expected publications could be found on the Internet from several nations far from Alaska and probably outside normal Rasmuson acquisitions processes. Malaspina was a Spanish navigator who explored a portion of the Alaska southern coast and Rasmuson Library coverage in monograph holdings was suspected to be quite limited. The choice of this specific localised subject was made to contrast with the presumed more general interest terms "reindeer" and "Inuit."

Internet search process

To understand the process and discoveries made during the searching on the Internet, a few examples will be presented. The subjects Inuit/Eskimo and Malaspina were searched in Spanish libraries. It was a pleasant surprise to discover that the University of Barcelona used the same VTLS software found at the University of Alaska. At first no titles about Eskimos could be identified, even though I had the correct spelling and word for these people in Spanish. By checking an English language book about Alaska in the Barcelona library, I discovered that a slightly different spelling was used at the library. This is presumably the Catalonian spelling, which I had neglected to consider. Using this spelling nine titles of interest with the subjects, Eskimos, Alaska, and Malaspina were located. However, it took 40 minutes of Internet connect time to find these titles because I had failed to carefully think through all possible languages and spellings of search terms used. Thirteen minutes were expended in determining that Rasmuson Library owned all but three of the nine titles.

Later in the month, two additional efforts were made to connect to the Barcelona University library catalogue; once for five minutes and another for three minutes before the Internet system disconnected the search. In sum, 61 minutes were expended to identify three unowned titles for a time expenditure of 20.3 minutes per title.

When connection failed with the Barcelona University Library, effort was transferred to another Spanish library, the Superior de Investigaciones Cientificas. This library utilised a totally unfamiliar software but had the advantage of being read in either Spanish or English. However, 40 minutes were needed to learn how to use the bibliographic software. Searching for Eskimos and Malaspina, 11 unknown titles were identified and 17 minutes were expended to determine that eight titles were unowned by Rasmuson. Thus total time expended was 57 minutes or 7.12 minutes per unowned title.

It took 35 minutes of effort to connect to a polar library in Canada after several Internet rejections and disconnections occurred. Once connected to the Canadian Circumpolar Library catalogue at the University of Alberta, about five minutes were needed to understand the search software. "Inuit" and " Northwest Territories" were searched as key words. This resulted in 487 bibliographic records identified; far more than could be easily searched, printed off and checked against Rasmuson Library's records for this preliminary project. Therefore, full records for only the first 13 titles were examined. Twelve of these were unknown and their records were examined and printed in 10 minutes. It took 12 minutes to check the 12 titles against Rasmuson holdings. Results indicated the only three of the 12 were owned by Rasmuson Library.

A second key word search was made using the words "caribou" and "Yukon Territory" which produced 272 bibliographic records. The first eight of these were examined in full and all eight records printed in eight minutes. It took six minutes to check these against Rasmuson records. This check showed that two titles were owned and six were not. To summarise, time expenditure related to the Canadian Circumpolar Library amounted to 71 minutes to identify 15 titles not owned or 4.73 minutes per unowned title.

Additional examples could be presented but these would simply expand on the experiences above with little additional different information. These seem sufficient to illustrate the Internet search process, results, and time expenditures for this presentation.

Commercial dealer catalogue search process

To compare the amount of time needed to identify desiderata for potential purchase on the Internet with the more traditional use of submitted commercial dealer catalogues the following procedure was followed. Three long out-of-print listings were time studied to determine average time needed to identify a single unowned title. The lists used included one American, one Canadian, and a German list. These contained a total of 1860 offered titles together with short annotations for most titles.

Initial review by the Arctic Bibliographer took 108 minutes or 17.2 titles per minute to select 669 titles for review. These were searched against Rasmuson Library's bibliographic database by a student assistant in 790 minutes or 1.18 minutes per title. A second search of the database records by a long time clerk with excellent language facility and experience followed. This clerk searched the remaining 134 titles in 241.2 minutes or 1.8 minutes per title. The above does not account for all time expended. The German list contained several obscure titles which required additional time checking items on the shelf and review for decision by the library's Rare Book Curator. This additional time amounted to 180 minutes. In the end, eighty titles out of 1860 offered were requested from the three dealer catalogues.

To summarise, following traditional methods outlined above, it required a Rasmuson Library investment of 1319 minutes or 16.49 minutes per title to identify monographs not owned, but desired for the library's polar collections. From the above examples is obvious that nearly all searches on the Internet, regardless of knowledge of language or library software, resulted in more unowned titles identified in less time than more traditional methods. Only the search of the Barcelona University Library had a greater time expenditure of 20.3 minutes per title than the 16.49 minutes per title for searching published paper out-of-print dealer catalogues.

Review of problems encountered

Based upon the above experiences some suggestions may be in order. It should go without saying that the more language facility a searcher holds, the more quickly the search process will probably be. The same applies to familiarity with several types of bibliographic software used for various library catalogue systems. Multiple experiences with any type of Internet searching should also speed the searchers ability to connect to unknown library systems. Assessing ones own limitations and making efforts to overcome them can probably be done by advance preparation. For example, identifying the correct search terms to be used in any language in advance as well as limiting searches to libraries with familiar software systems should reduce the problems encountered and the time needed for searches.

Another problem encountered was the limitations of certain Gopher interface programs which are supposed to assist searching distant library catalogue systems. The LIBS software interface at Sonoma State University in California has not kept pace with the extremely rapid growth of the Internet system. For example, LIBS to date, has no listing of French libraries but a listing of Internet addresses for French libraries was accidentally discovered on the Library of Congress Marvel System. This same French listing is available on the University of Minnesota Gopher II library interface program for

Internet searching. However, neither the Sonoma nor Minnesota programs contain Internet addresses for any Alaska libraries. This situation exists despite the fact that the Rasmuson Library has had an available address for at least nine years; well before the Internet system existed. The only Internet address for Alaska Libraries that I am aware of which uses a Gopher interface is the very recent one prepared in the last month by Eric Tull at the University of Calgary. These are only some examples of Internet limitations, and doubtless there are a great many more electronic library catalogues from many nations which could be identified as available than are currently easily identified.

It would be well to be prepared for some inevitable problems when conducting an Internet search for library bibliographic records. Always be prepared to write down or print the initial instructions for using a library system once you have connected to a particular library with unknown software. Without this information you can get locked into certain screens or search procedures and waste much time attempting to back out of the problems encountered. Be prepared to be disconnected from a local library system or part of the Internet system one or more times for each thirty minutes of time you put in. Be prepared to encounter an inability to connect to a particular library catalogue system, even though you have the correct Internet address and follow procedures correctly. Like all Internet addresses, library catalogues are arbitrarily closed down for repairs, updating, etc. at all times of the day or night. Others may be closed to remote access at certain hours, on certain busy days, or when a library is closed for the day. Be prepared to discover that a library catalogue connected to on one day will be impossible to access the following day, week or month.

Other polar libraries may wish to expand on this very preliminary use of the Internet system for identifying materials not in their own collections and/or for identifying titles they may wish to obtain. Obviously any title found in a library catalogue is likely to have already been in print for several months and may have already moved to an out-of-print status. Thus it may be that Internet searches will not have much utility for adding current publications to collections This paper does suggest that there is much room for retrospective collection additions. It also would indicate that Internet searching is probably a faster procedure for identifying desired titles than reviewing the offerings of commercial out-of-print dealers.

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Polar Libraries Gopher - an information source with potential

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Abstract: A new service for polar libraries was set up in June through the University of Calgary Library. The Polar Libraries Gopher is intended as a one-stop source for information about polar libraries, as well as a means of accessing and searching the computer catalogues of each library's holdings.

At this point the Polar Libraries Gopher has been set up on a trial basis. It contains information about the following libraries, and the means to connect to them:

1. Arctic Institute Library, University of Calgary
2. Canadian Circumpolar Library, University of Alberta
3. Ocean Engineering Information Centre, Memorial University of Newfoundland
4. Rasmuson Library and Alaska Periodical Index, University of Alaska, Fairbanks
5. Scott Polar Research Institute, Cambridge University

For each library there are two selections. The first choice provides information about the library. The second choice enables the user to leave the Gopher and connect directly to that Library's online computer catalogue. The first choice includes information on how to make the connection in order to search the catalogue (eg. passwords and procedures needed), and information on how to disconnect.

Descriptions of the three Canadian libraries were adopted from information very kindly provided by Martha Andrews (Institute of Arctic and Alpine Research, University of Colorado) from the material she and Liissa Kurppa (Arctic Centre, University of Lapland) and Ann Brennan (World Data Center A for Glaciology) have been assembling for the directory of polar libraries. Brief information for the other two libraries outlining the means of accessing their online catalogues.

To access the Polar Libraries Gopher issue the command <gopher gopher.ucalgary.ca> This will get you to the University of Calgary Gopher. Select <6.University Library> then select <13.Polar Libraries> Although at present a small trial, the Polar Libraries Gopher has the potential to become a considerably larger and more useful information source. Success of the Gopher will depend on whether potential users, and particularly members of the Polar Libraries Colloquy, would find such a gopher to be a useful information source.

The Gateway to Antarctica, an Internet World Wide Web server for Antarctic information

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Introduction

Over the past few years the number of organisations and individuals connected to Internet has grown dramatically, and with this growth there have been significant changes in the way information is transferred over Internet. The World Wide Web (WWW) is one of the latest such advances in information exchange using Internet. WWW is another application like e-mail, Telnet, FTP, Usenet news, and Gopher, that uses the communication channels of Internet to transfer information from one computer to another. In fact, WWW is now the third highest generator of network traffic over Internet. When part of the Internet backbone in the US was monitored earlier this year, over 1/3 of a terabyte of WWW data were seen passing through the network during a one month period. The 'Gateway to Antarctica' is a WWW server specialising in Antarctic information, with sections containing scientific, logistic, educational, and treaty information. It also provides links to much of the Antarctic related data already on Internet.

What is WWW?

WWW is a distributed hyper-media system. Its distributed nature means that information from universities, research organisations, and commercial agencies located in every continent of the globe can be found on the Web. This information is presented using hyper-media, a cross between hyper-text and multi-media. WWW brings text, images, audio, and video almost seamlessly onto the desktop, making them all accessible by the simple click of a mouse. It is this ease of use that is allowing the computer neophyte to locate and down-load megabytes of data about a mind-boggling array of subjects. And it is this in turn that has contributed to the huge increase in Internet traffic, and subsequent bottlenecks.

Information on the WWW is linked together by anchors that are embedded in text and images. By clicking on the highlighted text or graphics of an anchor the data to which the anchor points is retrieved. Anchors contain Universal Resource Locators (URL's) that can point to any other information or resource on Internet, so information about a particular subject can be linked together from anywhere in the world. Anchors can be created to on-line catalogues via the Telnet protocol, and to other information servers such as Gopher.

This linking together of various data formats is achieved by using a simple document description language - Hyper Text Mark-up Language (HTML). This language allows text documents to be attractively presented using several fonts and styles without having to transfer the description of the fonts or styles. This is achieved by describing documents in terms of their structure rather than their appearance.

The HTML definition also provides a forms interface. Documents can include electronic forms that can be filled out by anyone browsing the Web. These forms can be used to perform real-time queries of on-line databases or catalogues, to order products, or to provide input and instructions to interactive programs.

How does WWW work? How can I get access?

WWW is a client/server based system. Like the File Transfer Protocol (FTP) there are thousands of host computers connected to Internet that are running WWW servers. To connect to a WWW server and start browsing through the net your computer must be directly connected to Internet. This can be achieved in a number of ways: connect your computer to a LAN that is already connected to Internet; set up a Serial Line Internet Protocol (SLIP) connection to a local bulletin board or university; or rent a leased line from Telecom and connect directly to an Internet provider. SLIP connections are becoming more commonly available from local bulletin boards and appear to be the better option for home users.

Once your computer is part of Internet you need a WWW browser. The most popular browser in use on the Web today is a public domain program developed at the National Centre for Supercomputing Applications in the United States, known as NCSA Mosaic. Mosaic is available for most machines ranging from Unix workstations to Macintoshs and PCs running Windows. Mosaic is more than just a WWW browser, it also supports FTP, Usenet News, Gopher, and Wide Area

Information Servers (WAIS). Mosaic can be down-loaded from the NCSA FTP site (ftp.ncsa.uiuc.edu) or a quick search with archie may reveal suitable ftp sites that are closer. Once a computer is connected to Internet and a WWW browser has been installed, access to the Gateway to Antarctica is made by opening a connection to http://www.icair.iac.org.nz/, the URL that describes the location of the Gateway.

WWW browsers and servers "talk" to each other over Internet using yet another protocol, hyper-text transfer protocol, or HTTP. HTTP can transfer any type of digital data, and sets no limitation on file formats or size. When data is down-loaded to the browser, the data type is also transmitted. If the browser does not know how to display or play the data then it can check the data type and start an appropriate program for handling that data. Take for example a Quicktime movie. Most browsers don't know how to play a Quicktime movie, but there are suitable players for most hardware platforms. If such a player is present then the browser can pass the movie on to be displayed. By using this method for handling unknown data types, the browser is not limited to a fixed set of data types that it can view.

What is out there on the Web?

WWW originally started as the brain-child of scientists at the European Laboratory for Particle Physics (CERN) located in Geneva. Researchers needed a way to distribute their findings to the international scientific community. To fulfil this need the WWW project was born. Because the Web is so simple to access, and contains such rich information, it has generated more interest over a shorter period of time than any other Internet application.

The number of Antarctic related WWW servers and Internet resources is constantly growing, and it is not the aim of the Gateway to duplicate or mirror all of this information. To date there are several Antarctic groups and organisations maintaining WWW servers and other Internet resources, for example, Alfred Wegener Institute, Antarctica Meteorology Research Center, the Antarctic Cooperative Research Center, the Australian Working Group for Antarctic Astronomy, the Byrd Polar Research Center, the Italian Antarctic Program, the Office of Polar Programs, and the Polar Libraries Gopher. Our main aim is to provide a core of information locally, and more importantly, maintain links to as many other servers that provide Antarctic information on Internet. In this way, the Gateway to Antarctica will become exactly what it's name implies, a gateway to all other Antarctic information on Internet.

GRID, AMAP and CAFF

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Established in 1985, the Global Resource Information Database (GRID) is an important element within Earthwatch, the United Nations system-wide environmental assessment activity. GRID is a network of cooperating centres. There are 10 GRID centres established throughout the world today coordinated by the UNEP/GRID Programme Activity Centre in Nairobi, Kenya. GRID offers a unique international database service which contains more than 2000 digital environmental data sets.

Within the GRID system, GRID-Arendal has designated responsibility for polar regions and Nordic countries with adjacent seas. In addition to populating the GRID database with relevant data sets, GRID-Arendal provides an information service for the public, environmental database development, assistance in producing maps, organization of courses and workshops, and technical transfer and capacity building.

GRID-Arendal had contributed to the development of the AMAP (The Arctic Monitoring and Assessment Programme) project directly (AMAP-PD). This information, maintaining the information database, performing quality control and promoting efficient dissemination of the information. A PC-based database system for query and update of the directory is made available through Internet and modem link to GRID-Arendal.

In connection with the Ministerial meeting on the Arctic environmental Protection Strategy held in Greenland in September 1993, and as a follow up to the Rovaniemi process, the Norwegian Directorate for Nature Management prepared a report and established a database on habitat protection in the Arctic (CAFF - The Conservation of the Arctic Flora and Fauna). GRID-Arendal has contributed to the report through the development of a GIS database and produced approximately 20 maps illustrating different aspects of protected areas in the Arctic.

Use of electronic mail listservers as communication tools for polar research

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Listservers are notice boards which operate via electronic mail (e-mail). They monitor incoming e-mail and automatically forward it to members of a specific distribution list. Any person with access to E-mail can join a listserver and be able to receive and read messages posted by other members and send his or her own messages. Facilities usually exist to retrieve past messages from an archive and to obtain e-mail addresses of listserver members. Listservers allow an interactive exchange of information and views in a specialized field (e.g. biodiversity, molluscan taxonomy), and carry notices of meetings, job and bursary opportunities, and availability of published materials.

Recently, three listservers have been initiated that will be of interest to polar researchers and librarians. POLAR-L, operated from the University of Guelph, Canada, is concerned with topics about the Antarctic and Arctic generally. SANAP, operated from the University of Cape Town, has a narrower focus, dealing in the main with matters of interest and relevance to the South African National Antarctic Programme. IMON (the International Marine Ornithologists' Network) takes a global view, and covers seabirds, which are important parts of polar ecosystems and are widely studied at high latitudes. IMON is also operated from the University of Cape Town.

Examples of how these three listservers have served to disseminate polar information include advertising the 15th Polar Libraries Colloquy (POLAR-L), posting the latest conservation measures of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) designed to reduce the incidental mortality of seabirds from the long-line fishery (IMON), and advertising posts for a botanist and a microbial ecologist to work on nunatak ecosystems on the Antarctic Continent within the South African Antarctic programme (SANAP).

It is considered that as the availability and use of e-mail increases, listservers will serve an ever-increasingly important function in the speedy and reliable dissemination of knowledge. There are likely to become as important as more traditional ways of long-distance dissemination of information, such as by mailed letter, facsimile, telex, telephone, and for libraries, by interlibrary loans and exchange of publications.

Polar collections at Moscow libraries

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The Russian State Library (RSL) which was found in 1862 contains a collection of 37 000 000 volumes in 247 languages. There are types of resource: basic (books and periodicals in Russian and other languages), specialised (newspapers, maps, music and records, theses, technical documents, reference books, bibliographies, literature on arts and manuscripts) and subsidiary (subdivisions of branch, universal and reference literature). The central reference library of RSL has its own resource of 240 000 volumes of the 19th and 20th century. The system of catalogues includes the general systematic catalogue (two sections on books - ancient and modern, and two card indices), alphabetic, systematic and subject catalogues on books, journals and proceedings. The other card indices are the alphabetic register on bibliographies and reference journals, and the subject card indices on unpublished bibliographical lists.

The Arctic section embraces literature on such subject groups as archaeology, biogeography, geology, history, agriculture, forestry, sociology, fauna, flora, ethnography and others. The bibliographies are mainly on polar expeditions and discoveries. One of them, the systematic index to "The Northern Notes" journal, was published in 1916. Another one, "The Northern Bulletin", dates from 1804. The index to the articles on Russian history, geography, statistics and legislation is entitled "The Northern Archives". In 1948-1950, three bibliographies on expeditions were compiled: "The Russian polar navigators in the 17th to 19th century", "The Russian navigators in the Arctic and Pacific oceans" (documents on great Russian geographic discoveries in the 17th century) and "The history of great Russian geographic discoveries in the Arctic and Pacific oceans between the 17th and early 18th century". In 1967 the World Data Centre prepared the "Catalogue of data and publications on the Arctic and Antarctic". The bibliographical index "The North sea route and regions of the Far North" covers the period 1917-1945. The most detailed index to the first drifting scientific station "The North Pole" was issued in 1979.

The second library to be presented is the Central Scientific Agricultural Library (CSAL). It was originally established in 1930, soon after the USSR Agricultural Academy was set up. The library has over 3 000 000 accessioned volumes on agriculture and related subjects. The bibliographical rarities of CSAL date back to the 18th century. The pre-revolutionary magazines for a period of over 100 years are kept here. The alphabetic catalogues and card indices include catalogues of books, articles and proceedings, unpublished translations, deposited manuscripts and theses.

The section "The Far North of Russia" includes such themes as research, geography, nature, history, climate, soils, nature conservation, fauna, flora, stock-breeding, forestry, plant raising, statistics etc. The bibliographical index published in 1910 covers the documents of Arkhangelsk Society on "Investigations of the Russian North". A similar index was compiled by the Vologda Society. Bibliographies on agricultural research were issued by the Karelia and Kola branches of the Academy of Sciences. The list "The History of Agricultural Institutes" gives data for 1917-1974 while the index "Publications of the research institutes on agriculture" covers the period of 1931-1967. One of the most interesting books "The comprehensive collection of research expeditions over Russia" was published by the Emperor Academy of Sciences in 1819. The notes of the member of Navaya Zamlya Government Expedition "Polar Circle" were issued in 1909.

The third library is the collection of the Research Institute on Nature Conservation and Reserves. It was established in 1972. Currently it holds 31 500 Russian and 3000 foreign volumes, over 200 titles of journals in Russian and 500 in foreign languages. There is a collection of theses. The library has two catalogues (alphabetic and systematic catalogues of books) and four card indices (periodicals, theses, geographical index, dictionaries). The section on the Arctic includes literature on natural and geographic conditions, terrestrial and marine environment, ecosystems, fauna, flora, forestry, stock-breeding, hunting, statistics, sociological matters and other subjects related to polar information.

A multi-language index of permafrost terms

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Abstract: The Terminology Working Group of the International Permafrost Association has prepared a multi-language index of the main terms and synonyms contained in the "Glossary of Permafrost and Related Ground-Ice Terms" published by the National Research Council of Canada in 1988. The index covers some 650 terms and synonyms in English, French, German, Italian, Norwegian, Spanish, Swedish, and Russian. To simplify editing and updating, the index is prepared as a database, using WordPerfect version 5.1 for IBM-compatible computers. The database occupies about 260 000 bytes on diskette; it can be sorted alphabetically for any of the eight languages. Small files of layout specifications are used to print separate versions of the index for each of the eight languages, with the terms in the selected language as the prime entries. In the printouts, the sequence of the secondary entries can be varied as desired, but the Russian terms and their transliterations are most easily listed after the other languages, to minimize printer commands in the layout specifications. A database of English definitions for all the terms is also being prepared. Printouts of the current draft versions of the index and definitions will be available for distribution in hard-copy format, at cost.

Key words: permafrost, terminology, translations

Introduction

During the 5th International Permafrost Conference, held in Trondheim (Norway) in August 1988, the Council of the International Permafrost Association (IPA) authorized the establishment of a Terminology Working Group with the mandate "to develop a set of internationally accepted permafrost terms for use in engineering and science, with equivalents in various languages, and to disseminate and encourage the use of such terminology". The Terminology Working Group was established in the autumn of 1988, with members from Argentina, Canada, China, Finland, France, Germany, the USA, and the (former) USSR. Continuation of the Working Group, with additional members from Italy, Norway and Sweden, for the period 1993-1998, was approved during the 6th International Permafrost Conference in Beijing (China) in July 1993.

The Working Group agreed to use as the basis for its work the "Glossary of Permafrost and Related Ground-Ice Terms", which had just been published (Permafrost Subcommittee 1988). The initial effort was directed towards the preparation of a multi-language index incorporating the primary and secondary terms from the Glossary, and a number of synonyms. The languages to be covered by the index were to be English, French, German, Spanish, and Russian. Other languages were to be added if desirable. This effort was coordinated by the author. Since that time, Italian, Norwegian and Swedish have been added.

At about the same time, work started in Lanzhou (China) on a Chinese-English-Russian list of permafrost and frozen-ground terms, and in Moscow on a Russian-English glossary.

Translations

French

At the time of publication of the Glossary (Permafrost Subcommittee, 1988), a French translation was also published (Sous-comité de Pergélisol, 1988). From this, most of the French equivalents of the primary and secondary terms were incorporated in the glossary index without change. Changes were made for 46 of the terms, following suggestions from the French Commission for the Study of Periglacial Phenomena (Commission Française pour l'Étude des Phénomènes Périglaciaires), which were received from J.-P. Lautridou (Caen, France) in January 1991. Examples of the changes include: "couche active" instead of "mollisol"; "géli-adhérence" instead of "congélation adhérente"; and "frange gelante" instead of "frange gelée". Final corrections and additions were received in June 1993.

German

A German translation of "Permafrost Terminology" (Brown & Kupsch 1974) had been prepared in 1982 by J. Karte (Bonn, Germany). The German equivalent terms from that translation were incorporated in the glossary index, with a number of corrections and additions provided by J. Karte in September 1991. Corrections are still needed for a number of German terms added since that time.

Italian
Italian translations of the Glossary terms were prepared by C. Ottone (Pavia, Italy) and F. Dramis (Camerino, Italy) in 1992, and incorporated in the index after they were formally accepted in November 1992 by the Italian adhering body for IPA. Translations of additional terms were provided in early 1994.

Norwegian
Preparation of a listing of Norwegian terms for the index did not get underway until late 1992. The list of Norwegian terms was received in April 1993, and the terms were incorporated in the index before the 6th International Conference on Permafrost in Beijing, July 1993. Additional terms (and corrections) were supplied in March 1994.

Spanish
The Spanish translation of the glossary terms was prepared by A. E. Corte and E. Buk (Mendoza, Argentina). Their listing of the Spanish equivalents of the primary terms was received in February 1990; secondary terms were added in May 1990, and final additions and corrections were received in June and July 1993.

Swedish
Preparation of a listing of Swedish terms for the index also did not get underway until the fall of 1992. The list of Swedish terms was received in April 1993, and the terms were incorporated in the index before the 6th International Conference on Permafrost in Beijing, July 1993. Additional terms (and corrections) were supplied in late 1993.

Russian
A copy of the Russian translation of the whole Glossary, prepared by N. N. Romanovsky, G. Rozenbaum, and V. N. Konishchev (Moscow, Russia), was received in February 1991. The Russian equivalents of the primary and secondary terms have been incorporated in the multi-language index. Corrections and a number of additional terms were provided by the same authors in early 1994. In the meantime, an expanded glossary of Russian terms, with English equivalents has been compiled by Romanovsky and his co-workers. Currently, the definitions and comments in that expanded Russian glossary are being translated into English, with support from the IPA. Russian/English and English/Russian versions of the term listing are being prepared at the Arctic Institute in Calgary. Transliterations of Russian terms, from the Cyrillic alphabet to the Latin alphabet, using the Library of Congress system, have been added to the terminology index for the convenience of non-Russian users.

Synonyms
A number of synonyms (including terms designated as "not recommended" in the 1988 Glossary) have been included in the current terminology index, because many of these terms are found in the early permafrost literature.

Form of the index

To simplify editing and updating, the index was prepared as a database, using WordPerfect version 5.1 (for IBM and compatible computers). The index is maintained as a master list of *records*, in which each record comprises the following *fields*:

1) a sequential number; 2) the English term; 3) the French equivalent; 4) the German equivalent; 5) the Italian equivalent; 6) the Norwegian equivalent; 7) the Spanish equivalent; 8) the Swedish equivalent; 9) the Russian equivalent; and 10) the transliterated Russian equivalent.

In order to avoid possible confusion of entries such as "ice, wedge" and "ice wedge", all multi-word terms have been entered in the index using the natural word sequence (i.e. "wedge ice" and "ice wedge" for the above example). The elimination of commas also improved the quality of machine sorting.

The database can be sorted alphabetically for any of the eight languages. Small files of layout specifications can then be used to print separate versions of the index for each of the eight languages, with the terms in the selected language as the prime entries (see Figs 1 to 8). In individual printouts, the sequence of the secondary entries can be varied as desired, but the Russian terms and their transliterations are best listed after the other languages, to minimize printer commands in the layout specifications. A utility program (Lines, Boxes Etc., from MAP Systems, Houston) is used by the author to enhance print quality and printing speed on dot-matrix printers.

Currently, the Index database occupies about 258 000 bytes on diskette; individual language sections with layout specifications each occupy between 199 000 and 268 000 bytes on diskette, and 16 to 20 single-spaced pages in print-out. The draft of revised definitions occupies about 254 000 bytes on diskette (85 pages in printout), and the list of references 53 000 bytes on diskette (13 pages in printout).

Availability

Photocopies of printouts of the current draft of the multi-language Index can be obtained from the author, at a nominal cost of US$ 5.00 per language section, or US$ 30.00 for the eight-language set, and US$ 12.00 for the updated definitions. At the time of writing of this paper, no decision had been made regarding the eventual publication of the index.

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acoustically-defined permafrost (→ **ice-bonded permafrost**)

active air-cooled thermal pile
Fr..pieu thermique à circulation d'air froid. Ge..Kühlpfahl mit Luftzirkulation. It..pilone termico attivo raffreddato ad aria. No..aktiv luftavkjøld termopel. Sp..pila térmica activa a circulación de aire frío. Sw..aktivt luftkyld kylpåle. Ru..термосвая с активным охлаждением воздухом [termosvaia s aktivnym okhlazhdeniem vozdukhom].

active construction methods in permafrost
Fr..méthodes actives de construction dans le pergélisol. Ge..aktive Bauverfahren für Permafrost. It..metodi attivi di costruzione nel permafrost. No..aktive konstruksjonsmetoder i permafrost. Sp..métodos activos de construcción en permafrost. Sw..aktiva konstruktionsmetoder i permafrost. Ru..активные методы строительства на вечной мерзлоте [aktivnye metody stroitel'stva na vechnoi merzlote].

active frost (→ **seasonal frost**)

active ice wedge
Fr..coin de glace actif. Ge..aktiver Eiskeil. It..cuneo di ghiaccio attivo. No..aktiv iskile. Sp..cuña de hielo activa. Sw..aktiv iskil. Ru..растущая ледяная жила [rastushchaia ledianaia zhila].

active layer
Fr..couche active. Ge..Auftauboden. It..strato attivo. No..aktivt lag. Sp..capa activa. Sw..aktivt lager. Ru..деятельный слои [deiatel'nyi sloi].

active-layer failure
Fr..décollement dans la couche active. Ge..Auftauboden-Sackung. It..collasso dello strato attivo. No..brudd i aktivt lag. Sp..falla de la capa activa. Sw..kollaps i aktiva lagret. Ru..смещение деятельного слоя [smeshchenie deiatel'nogo sloia].

active-layer glide (→ **active-layer failure**)

active-layer thickness
Fr..épaisseur de la couche active. Ge..Auftaubodenmächtigkeit. It..spessore del strato attivo. No..aktivt lager mektighet. Sp..espesor de la capa activa. Sw..aktivt lager tjocklek. Ru..мощность деятелъного слоя [moshchnost' deiatel'nogo sloia].

active liquid-refrigerant thermal pile
Fr..pieu thermique à réfrigérant liquide. Ge..Kühlpfahl mit flüssigem Kühlmittel. It..pilone termico attivo a refrigerante liquido. No..aktiv væskeavkjølt termopel. Sp..pila térmica activa a refrigerante líquido. Sw..aktivt vätskekyld kylpåle. Ru..термосвая с активным охлаждением жидкостью [termosvaia s aktivnym okhlazhdeniem zhidkost'iu].

active rock glacier
Fr..glacier rocheux actif. Ge..aktiver Blockgletscher. It..rock glacier attivo. No..aktiv steinbre. Sp..glaciar de detrito activo. Sw..aktiv blockglaciär. Ru..активный каменный глетчер [aktivnyi kamennyi gletcher].

active thermokarst
Fr..thermokarst actif. Ge..aktiver Thermokarst. It..termocarsismo attivo. No..aktiv termokarst. Sp..termocarst activo. Sw..aktiv termokarst. Ru..активный термокарст [aktivnyi termokarst].

active zone (→ **active layer**)

adfreeze / adfreezing
Fr..géli-adhérence. Ge..Anfrieren. It..congelamento aderente. No..tilfrysning. Sp..congelamiento adherente. Sw..fastfrysning. Ru..смерзаться / смерзание [smerzat'sia / smerzanie].

adfreeze strength
Fr..résistance de la géli-adhérence. Ge..Anfrierungsfestigkeit. It..resistenza per congelamento aderente. No..tilfrysningsstyrke. Sp..fuerza de la congelación adherente. Sw..frostgreppsstyrka. Ru..сила смерзания [sila smerzaniia].

adfreezing force (→ **adfreeze strength**)

aggradational ice
Fr..glace d'agradation (d'accroissement). Ge..Aggradationseis. It..ghiaccio di aggradazione. No..aggradasjonsis. Sp..hielo agradacional. Sw..aggradationsis. Ru..аградационный лед [agradatsionnyi led].

air freezing index
Fr..indice de gel de l'air. Ge..atmosphärischer Gefrierindex. It..indice di gelo nell'aria. No..lufts fryseindeks. Sp..índice de congelamiento del aire. Sw..frostindex i luften. Ru..атмосферный индекс промерзания [atmosfernyi indeks promerzaniia].

air thawing index
Fr..indice de dégel de l'air. Ge..atmosphärischer Auftauindex. It..indice di disgelo nell'aria. No..lufts tineindeks. Sp..índice de descongelamiento del aire. Sw..töindex i luften. Ru..атмосферный индекс протаивания [atmosfernyi indeks protaivaniia].

alas / alass
Fr..alass. Ge..Alas / Alass. It..alas. No..alass. Sp..alass. Sw..alass. Ru..алас [alas].

albedo
Fr..albedo. Ge..Albedo. It..albedo. No..albedo. Sp..albedo. Sw..albedo. Ru..альбедо [al'bedo].

alpine permafrost (→ **mountain permafrost**)

altiplanation terrace (→ **cryoplanation terrace**)

altitudinal permafrost limit
Fr..limite altitudinale de pergélisol. Ge..altitudinale Permafrostverbreitungsgrenze. It..limite altitudinale del permafrost. No..høydeavhengig permafrostgrense. Sp..límite altitudinal del permafrost. Sw..altitudinell permafrostgräns. Ru..высотная граница вечной мерзлоты [vysotnaia granitsa vechnoi merzloty].

annual frost zone (→ **active layer**)

annually frozen/thawed layer (→ **active layer**)

apparent heat capacity
Fr..capacité calorifique apparente. Ge..scheinbare Wärmekapazität. It..capacità termica apparente. No..tilsynelatende varmekapasitet. Sp..capacidad de calor aparente. Sw..skenbar värmekapacitet. Ru..эффективная теплоемкость [effektivnaia teploemkost'].

approximate freezing index
Fr..indice de gel approximatif. Ge..approximativer Gefrierindex. It..indice approssimato di congelamento. No..tilnærmet

Fig. 1. Sample of the English version.

abaissement du point de congélation
En..freezing-point depression. Ge..Gefrierpunktserniedrigung. It..abbassamento del punto di congelamento. No..frysepunkt senkning. Sp..depresión del punto de congelamiento. Sw..fryspunktsnedsättning. Ru..понижение точки замерзания [ponizhenie tochki zamerzaniia].

action du gel (→ gélivation)

affaiblissement dû au dégel
En..thaw weakening. Ge..auftaubedingte Abschwächung. It..indebolimento da disgelo. No..tinesvekkelse. Sp..debilitación por descongelamiento. Sw..töförsvagning. Ru..ослабление прочности грунта при протаивании [oslablenie prochnosti grunta pri protaivanii].

affaissement de dégel
En..thaw sink. Ge..Tausenke. It..depressione di disgelo. No..tineavløp. Sp..dolina de descongelamiento. Sw..termokarstsänka. Ru..понижение обусловленное протаиванием [ponizhenie obuslovlennoe protaivaniem].

agradation du pergélisol
En..permafrost aggradation. Ge..Permafrost-Aggradation. It..aggradazione del permafrost. No..permafrostutvidelse. Sp..agradación del permafrost. Sw..permafrosttillväxt. Ru..аградация вечной мерзлоты [agradatsiia vechnoi merzloty].

aiguille de glace (→ pipkrake)

alass
En..alas / alass. Ge..Alas / Alass. It..alas. No..alass. Sp..alass. Sw..alass. Ru..алас [alas].

albedo
En..albedo. Ge..Albedo. It..albedo. No..albedo. Sp..albedo. Sw..albedo. Ru..альбедо [al'bedo].

amas de neige
En..snowdrift. Ge..Schneewehe. It... No..snøfonn. Sp..nieve acarreada. Sw..snödrev. Ru..снежный сугроб [snezhnyi sugrob].

aquiclude cryogénique (→ piégeage aqueux cryogénique)

aufeis (→ glaçage)

baidjarakh (→ butte de thermokarst)

base du pergélisol (→ plancher du pergélisol)

béton de glace / géliciment
En..permacrete. Ge..Frostbeton. It..permacrete. No..jordsement. Sp..gelicemento. Sw..isbetong. Ru..искусственно приготовленные блоки (кирпичи) из мерзлого грунта [iskusstvenno prigotovlennye bloki (kirpichi) iz merzlogo grunta].

bulbe de dégel
En..thaw bulb. Ge..Tau-Aureole. It..bulbo di disgelo. No..tineboble. Sp..bulbo de descongelamiento. Sw..töbulb. Ru..ореол протаивания [oreol protaivaniia].

bulte gazonnée tourbeuse
En..peat hummock. Ge..Torfbülte. It... No..torvtue. Sp..montículo turboso. Sw..pouno. Ru..торфяная кочка [torfianaia kochka].

butte cryogénique
En..frost mound. Ge..Frost-Hügel. It..monticello criogenico. No..frosthaug. Sp..domo de congelamiento. Sw..frostkulle. Ru..бугор пучения [bugor pucheniia].

butte de glaçage
En..icing mound. Ge..Aufeis-Hügel. It..monticello da ghiacciamento superficiale. No..isforhøyning. Sp..montículo de engelamiento. Sw..svalliskulle. Ru..наледный бугор [nalednyi bugor].

butte de terre
En..earth hummock. Ge..Erdbülte. It..cuscinetto di terra. No..tue. Sp..montículo de tierra. Sw..jordtuva. Ru..земляная кочка (бугорок) [zemlianaia kochka (bugorok)].

butte de thermokarst
En..thermokarst mound. Ge..Thermokarst-Hügel. It..monticello termocarsico. No..termokarst haug. Sp..montículo de termocarst. Sw..termokarstkulle. Ru..термокарстовый бугор [termokarstovyi bugor].

butte gazonnée
En..turf hummock. Ge..Rasenbülte. It..cuscinetto torboso. No..torvtue. Sp..montículo hierboso. Sw..torvkulle. Ru..дерновая кочка [dernovaia kochka].

capacité calorifique
En..heat capacity. Ge..Wärmekapazität. It..capacità termica. No..varmekapasitet. Sp..capacidad de calor. Sw..värmekapacitet. Ru..теплоемкость [teploemkost'].

capacité calorifique apparente
En..apparent heat capacity. Ge..scheinbare Wärmekapazität. It..capacità termica apparente. No..tilsynelatende varmekapasitet. Sp..capacidad de calor aparente. Sw..skenbar värmekapacitet. Ru..эффективная теплоемкость [effektivnaia teploemkost'].

capacité calorifique massique (→ chaleur spécifique)

capacité calorifique volumique
En..volumetric heat capacity. Ge..volumetrische Wärmekapazität. It..capacità termica volumetrica. No..volumetrisk varmekapasitet. Sp..capacidad de calor volumétrico. Sw..volumetrisk värmekapacitet. Ru..объемная теплоемкость [ob'emnaia teploemkost'].

cercle de boue
En..mud circle. Ge..Lehmkreis. It..circolo di fango. No..mudsirkel. Sp..círculo de barro. Sw..jordcirkel. Ru..пятно-медальон незазернованное [piatno-medal'on nezazernovannoe].

cercle de pierres
En..stony earth circle. Ge..Steinkreis. It..circolo di pietre. No..steinrik jordsirkel. Sp..círculo de tierra pedregoso. Sw..blockig jordruta. Ru..каменно-земляные круги [kamenno-zemlianye krugi].

cercle sans triage
En..nonsorted circle. Ge..nichtsortierter Feinerdekreis. It..circolo non selezionato. No..usortert sirkel. Sp..círculo no seleccionado. Sw..osorterad cirkel. Ru..несортированный круг [nesortirovannyi krug].

cercle trié
En..sorted circle. Ge..Steinring. It..circolo selezionato. No..sortert sirkel. Sp..círculo seleccionado. Sw..stenring. Ru..сортированный круг [sortirovannyi krug].

chaleur latente (de fusion)
En..latent heat (of fusion).

Fig. 2. Sample of the French version.

Abscherung
En..detachment failure. Fr..rupture par décollement. It..frana di distacco. No..detasjementbrudd. Sp..ruptura por despegamiento. Sw..skred i aktiva lagret. Ru..смещение грунта с отрывом [smeshchenie grunta s otryvom].

Adereis (→ Veneneis)

adsorbiertes Wasser
En..interfacial water. Fr..eau d'interface. It..acqua di interfaccia. No..partikkelbundet vann. Sp..agua interfacial. Sw..hygroskopiskt vatten. Ru..межчастичная вода [mezhchastichnaia voda].

Aggradationseis
En..aggradational ice. Fr..glace d'agradation (d'accroissement). It..ghiaccio di aggradazione. No..aggradasjonsis. Sp..hielo agradacional. Sw..aggradationsis. Ru..аградационный лед [agradatsionnyi led].

aktive Bauverfahren für Permafrost
En..active construction methods in permafrost. Fr..méthodes actives de construction dans le pergélisol. It..metodi attivi di costruzione nel permafrost. No..aktive konstruksjonsmetoder i permafrost. Sp..métodos activos de construcción en permafrost. Sw..aktiva konstruktionsmetoder i permafrost. Ru..активные методы строительства на вечной мерзлоте [aktivnye metody stroitel'stva na vechnoi merzlote].

aktiver Blockgletscher
En..active rock glacier. Fr..glacier rocheux actif. It..rock glacier attivo. No..aktiv steinbre. Sp..glaciar de detrito activo. Sw..aktiv blockglaciär. Ru..активный каменный глетчер [aktivnyi kamennyi gletcher].

aktiver Eiskeil
En..active ice wedge. Fr..coin de glace actif. It..cuneo di ghiaccio attivo. No..aktiv iskile. Sp..cuña de hielo activa. Sw..aktiv iskil. Ru..растущая ледяная жила [rastushchaia ledianaia zhila].

aktiver Thermokarst
En..active thermokarst. Fr..thermokarst actif. It..termocarsismo attivo. No..aktiv termokarst. Sp..termocarst activo. Sw..aktiv termokarst. Ru..активный термокарст [aktivnyi termokarst].

akustisk definert permafrost (→ isbundet permafrost)

Alas / Alass
En..alas / alass. Fr..alass. It..alas. No..alass. Sp..alass. Sw..alass. Ru..алас [alas].

Albedo
En..albedo. Fr..albedo. It..albedo. No..albedo. Sp..albedo. Sw..albedo. Ru..альбедо [al'bedo].

alpiner Permafrost (→ Hochgebirgspermafrost)

altitudinale Permafrostverbreitungsgrenze
En..altitudinal permafrost limit. Fr..limite altitudinale de pergélisol. It..limite altitudinale del permafrost. No..høydeavhengig permafrostgrense. Sp..límite altitudinal del permafrost. Sw..altitudinell permafrostgräns. Ru..высотная граница вечной мерзлоты [vysotnaia granitsa vechnoi merzloty].

Anfrieren
En..adfreeze / adfreezing. Fr..géli-adhérence. It..congelamento aderente. No..tilfrysning. Sp..congelamiento adherente. Sw..fastfrysning. Ru..смерзаться / смерзание [smerzat'sia / smerzanie].

Anfrierungsfestigkeit
En..adfreeze strength. Fr..résistance de la géli-adhérence. It..resistenza per congelamento aderente. No..tilfrysningsstyrke. Sp..fuerza de la congelación adherente. Sw..frostgreppsstyrka. Ru..сила смерзания [sila smerzaniia].

approximativer Auftauindex
En..approximate thawing index. Fr..indice de dégel approximatif. It..indice di disgelo approssimato. No..tilnærmet tineindeks. Sp..índice de descongelamiento aproximado. Sw..uppskattat töindex. Ru..приближенный индекс протаивания [priblizhennyi indeks protaivaniia].

approximativer Gefrierindex
En..approximate freezing index. Fr..indice de gel approximatif. It..indice approssimato di congelamento. No..tilnærmet fryseindeks. Sp..índice de congelamiento aproximado. Sw..uppskattat frostindex. Ru..приближенный индекс промерзания [priblizhennyi indeks promerzaniia].

atmosphärischer Auftauindex
En..air thawing index. Fr..indice de dégel de l'air. It..indice di disgelo nell'aria. No..lufts tineindeks. Sp..índice de descongelamiento del aire. Sw..töindex i luften. Ru..атмосферный индекс протаивания [atmosfernyi indeks protaivaniia].

atmosphärischer Gefrierindex
En..air freezing index. Fr..indice de gel de l'air. It..indice di gelo nell'aria. No..lufts fryseindeks. Sp..índice de congelamiento del aire. Sw..frostindex i luften. Ru..атмосферный индекс промерзания [atmosfernyi indeks promerzaniia].

Aufeis
En..icing. Fr..glaçage. It..ghiacciamento superficiale. No..ising. Sp..engelamiento. Sw..svallis. Ru..наледь [naled'].

Aufeis-Hügel
En..icing mound. Fr..butte de glaçage. It..monticello da ghiacciamento superficiale. No..isforhøyning. Sp..montículo de engelamiento. Sw..svalliskulle. Ru..наледный бугор [nalednyi bugor].

Aufeisblase
En..icing blister. Fr..dôme de glaçage. It..blister da ghiacciamento superficiale. No..isboble. Sp..domo de engelamiento. Sw..svalliskupol. Ru..наледный бугор пучения [nalednyi bugor pucheniia].

Auffrieren
En..frost jacking. Fr..éjection gélivale. It..eiezione criogenica. No..frosthiv. Sp..eyección por congelamiento. Sw..frostlyftning. Ru..мороэное выпучивание (вымораживание) [moroznoe vypuchivanie (vymorazhivanie)].

aufgetauter Boden
En..thawed ground. Fr..sol dégelé. It..terreno disgelato. No..tinet grunn. Sp..suelo descongelado. Sw..upptinad mark. Ru..талый грунт (отложение, порода) [talyi grunt (otlozhenie, poroda)].

Fig. 3. Sample of the German version.

abbassamento del punto di congelamento
En..freezing-point depression. Fr..abaissement du point de congélation. Ge..Gefrierpunktserniedrigung. No..frysepunkt senkning. Sp..depresión del punto de congelamiento. Sw..fryspunktsnedsättning. Ru..понижение точки замерзания [ponizhenie tochki zamerzaniia].

acqua di interfaccia
En..interfacial water. Fr..eau d'interface. Ge..adsorbiertes Wasser. No..partikkelbundet vann. Sp..agua interfacial. Sw..hygroskopiskt vatten. Ru..межчастичная вода [mezhchastichnaia voda].

acqua di intrapermafrost
En..intrapermafrost water. Fr..eau intrapergélisol. Ge..Intrapermafrostwasser. No..intrapermafrost vann. Sp..agua de intrapermafrost. Sw..intrapermafrostvatten. Ru..межмерзлотные воды [mezhmerzlotnye vody].

acqua di soprapermafrost
En..suprapermafrost water. Fr..eau suprapergélisol. Ge..Suprapermafrostwasser. No..vann over permafrosten. Sp..agua de suprapermafrost. Sw..suprapermafrostvatten. Ru..надмерзлотные воды [nadmerzlotnye vody].

acqua di sottopermafrost
En..subpermafrost water. Fr..eau infrapergélisol. Ge..Subpermafrostwasser. No..vann under permafrosten. Sp..agua de subpermafrost. Sw..subpermafrostvatten. Ru..подмерзлотные воды [podmerzlotnye vody].

acqua interstiziale
En..pore water. Fr..eau interstitielle. Ge..Porenwasser. No..porevann. Sp..agua intersticial. Sw..porvatten. Ru..поровая вода [porovaia voda].

acqua libera
En..free water. Fr..eau libre. Ge..freies Wasser. No..fritt vann. Sp..agua de poros. Sw..fritt vatten. Ru..свободная вода [svobodnaia voda].

acquiclude criogenico
En..cryogenic aquiclude. Fr..piégeage aqueux cryogénique. Ge..kryogener Grundwasserstauer. No..kryogenetisk akviklude. Sp..acuiclusa criogénica. Sw..kryogen akviclud. Ru..криогенный водоупор [kriogennyi vodoupor].

aggradazione del permafrost
En..permafrost aggradation. Fr..agradation du pergélisol. Ge..Permafrost-Aggradation. No..permafrostutvidelse. Sp..agradación del permafrost. Sw..permafrosttillväxt. Ru..аградация вечной мерзлоты [agradatsiia vechnoi merzloty].

aghi di ghiaccio
En..needle ice. Fr..pipkrake. Ge..Kammeis. No..nåleis. Sp..hielo acicular. Sw..pipkrake. Ru..игольчатый лед [igol'chatyi led].

alas
En..alas / alass. Fr..alass. Ge..Alas / Alass. No..alass. Sp..alass. Sw..alass. Ru..алас [alas].

albedo
En..albedo. Fr..albedo. Ge..Albedo. No..albedo. Sp..albedo. Sw..albedo. Ru..альбедо [al'bedo].

assestamento da disgelo
En..thaw settlement. Fr..tassement dû au dégel. Ge..auftaubedingte Setzung. No..tinesynkning. Sp..asentamiento por descongelamiento. Sw..upptiningssättning. Ru..осадка при оттаивании [osadka pri ottaivanii].

assestamento del terreno (→ assestamento da disgelo)

azione del gelo
En..frost action. Fr..gélivation. Ge..Frostwirkung. No..fryseprosess. Sp..acción del congelamiento. Sw..frostprocesser. Ru..криогенные процессы [kriogennye protsessy].

azione del gelo/disgelo (→ azione del gelo)

barrens
En..barrens. Fr..désert de gélivation. Ge..Ödländer. No..goldt land(skap). Sp..estéril. Sw..köldöken. Ru..пустошь (лишенная растительность поверхноцть земли) [pustosh' (lishennaia rastitel'nost' poverkhnost' zemli)].

base del permafrost
En..permafrost base. Fr..plancher du pergélisol. Ge..Permafrostuntergrenze. No..permafrostbasis. Sp..base del permafrost. Sw..permafrostbas. Ru..подошва вечной мерзлоты [podoshva vechnoi merzloty].

blister criogenico
En..frost blister. Fr..hydrolaccolite saisonnier. Ge..Frostblase. No..frostblemmer. Sp..domo de congelamiento estacional con nucleo de hielo. Sw..tjälkupol. Ru..гидролакколит сезонный [gidrolakkolit sezonnyi].

blister da ghiacciamento superficiale
En..icing blister. Fr..dôme de glaçage. Ge..Aufeisblase. No..isboble. Sp..domo de engelamiento. Sw..svalliskupol. Ru..наледный бугор пучения [naledнyi bugor pucheniia].

bulbo di disgelo
En..thaw bulb. Fr..bulbe de dégel. Ge..Tau-Aureole. No..tineboble. Sp..bulbo de descongelamiento. Sw..töbulb. Ru..ореол протаивания [oreol protaivaniia].

calore latente (di fusione)
En..latent heat (of fusion). Fr..chaleur latente (de fusion). Ge..Schmelzwärme. No..latent (tine)varme. Sp..calor latente (de fusión). Sw..latent (fusions)värme. Ru..скрытая теплота (плавления) [skrytaia teplota (plavleniia)].

calore latente volumetrico di fusione
En..volumetric latent heat of fusion. Fr..chaleur latente volumique de fusion. Ge..volumetrische Schmelzwärme. No..volumetrisk latent tinevarme. Sp..calor latente de fusión volumétrico. Sw..volumetrisk latent fusionsvärme. Ru..объемная скрытая теплота плавления [ob'emnaia skrytaia teplota plavleniia].

campo di massi (→ campo di pietre)

campo di pietre
En..block field. Fr..champ de blocs. Ge..Blockfeld. No..blokkmark. Sp..campo de bloques. Sw..blockfält. Ru..глыбовое (каменное) поле [glybovoe (kamennoe) pole].

canale a grani di rosario (→ corso di acqua a grani di rosario)

capacitá termica
En..heat capacity. Fr..capacité calorifique. Ge..Wärmekapazität. No..varmekapasitet.

Fig. 4. Sample of the Italian version.

aggradasjonsis
En..aggradational ice. Fr..glace d'agradation (d'accroissement). Ge..Aggradationseis. It..ghiaccio di aggradazione. Sp..hielo agradacional. Sw..aggradationsis. Ru..аградационный лед [agradatsionnyi led].

aktiv frost (→ sesongmessig frost)

aktiv iskile
En..active ice wedge. Fr..coin de glace actif. Ge..aktiver Eiskeil. It..cuneo di ghiaccio attivo. Sp..cuña de hielo activa. Sw..aktiv iskil. Ru..растущая ледяная жила [rastushchaia ledianaia zhila].

aktiv luftavkjøld termopel
En..active air-cooled thermal pile. Fr..pieu thermique à circulation d'air froid. Ge..Kühlpfahl mit Luftzirkulation. It..pilone termico attivo raffreddato ad aria. Sp..pila térmica activa a circulación de aire frío. Sw..aktivt luftkyld kylpåle. Ru..термосвая с активным охлаждением воздухом [termosvaia s aktivnym okhlazhdeniem vozdukhom].

aktiv sone (→ aktivt lag)

aktiv steinbre
En..active rock glacier. Fr..glacier rocheux actif. Ge..aktiver Blockgletscher. It..rock glacier attivo. Sp..glaciar de detrito activo. Sw..aktiv blockglaciär. Ru..активный каменный глетчер [aktivnyi kamennyi gletcher].

aktiv termokarst
En..active thermokarst. Fr..thermokarst actif. Ge..aktiver Thermokarst. It..termocarsismo attivo. Sp..termocarst activo. Sw..aktiv termokarst. Ru..активный термокарст [aktivnyi termokarst].

aktiv væskeavkjølt termopel
En..active liquid-refrigerant thermal pile. Fr..pieu thermique à réfrigérant liquide. Ge..Kühlpfahl mit flüssigem Kühlmittel. It..pilone termico attivo a refrigerante liquido. Sp..pila térmica activa a refrigerante líquido. Sw..aktivt vätskekyld kylpåle. Ru..термосвая с активным охлаждением жидкостью [termosvaia s aktivnym okhlazhdeniem zhidkost'iu].

aktive konstruksjonsmetoder i permafrost
En..active construction methods in permafrost. Fr..méthodes actives de construction dans le pergélisol. Ge..aktive Bauverfahren für Permafrost. It..metodi attivi di costruzione nel permafrost. Sp..métodos activos de construcción en permafrost. Sw..aktiva konstruktionsmetoder i permafrost. Ru..активные методы строительства на вечной мерзлоте [aktivnye metody stroitel'stva na vechnoi merzlote].

aktivt lag
En..active layer. Fr..couche active. Ge..Auftauboden. It..strato attivo. Sp..capa activa. Sw..aktivt lager. Ru..деятельный слой [deiatel'nyi sloi].

aktivt lager mektighet
En..active-layer thickness. Fr..épaisseur de la couche active. Ge..Auftaubodenmächtigkeit. It..spessore del strato attivo. Sp..espesor de la capa activa. Sw..aktivt lager tjocklek. Ru..мощность деятелъного слоя [moshchnost' deiatel'nogo sloia].

alass
En..alas / alass. Fr..alass. Ge..Alas / Alass. It..alas. Sp..alass. Sw..alass. Ru..алас [alas].

albedo
En..albedo. Fr..albedo. Ge..Albedo. It..albedo. Sp..albedo. Sw..albedo. Ru..альбедо [al'bedo].

alpin permafrost (→ fjellpermafrost)

altiplanasjonsterrasse (→ kryoplanasjonsterrasse)

åpen talik
En..open talik. Fr..talik ouvert. Ge..offener Talik. It..talik aperto. Sp..talik abierto. Sw..öppen talik. Ru..сквозной талик [skvoznoi talik].

åpent system frysing
En..open-system freezing. Fr..engel en système ouvert. Ge..Gefrieren im offenen System. It..congelamento in sistema aperto. Sp..congelamiento en sistema abierto. Sw..frysning i öppna system. Ru..промерзание в открытой системе [promerzanie v otkrytoi sisteme].

åpent system pingo
En..open-system pingo. Fr..pingo en système ouvert. Ge..Pingo vom offenen System. It..pingo a sistema aperto. Sp..pingo de sistema abierto. Sw..öppen system pingo. Ru..пинго открытой системы [pingo otkrytoi sistemy].

åreis
En..vein ice. Fr..glace de fissure. Ge..Veneneis. It..ghiaccio di vena. Sp..hielo de veta. Sw..åderis. Ru..жильный лед [zhil'nyi led].

årlig frostsone (→ aktivt lag)

årlig fryse/tine lag (→ aktivt lag)

årlig middel grunntemperatur
En..mean annual ground temperature. Fr..température annuelle moyenne du sol. Ge..Jahresmitteltemperatur des Bodens. It..temperatura media annua del terreno. Sp..temperatura media anual del suelo. Sw..årsmedel marktemperatur. Ru..среднегодовая температура грунта [srednegodovaia temperatura grunta].

årlig middel overflatetemperatur
En..mean annual ground-surface temperature. Fr..température annuelle moyenne de la surface. Ge..Jahresmitteltemperatur der Bodenoberfläche. It..temperatura media annua della superficie (del terreno). Sp..temperatura media anual del superficie. Sw..årsmedel markytetemperatur. Ru..среднегодовая температура поверхности грунта [srednegodovaia temperatura poverkhnosti grunta].

basal heving (→ frostheving)

basal kryopeg
En..basal cryopeg. Fr..cryopeg basal. Ge..basaler Kryopeg. It..criopeg basale. Sp..criopeg basal. Sw..basal kryopeg. Ru..подмерзлотный криопег [podmerzlotnyi kriopeg].

beaded drenering (→ perle drenering)

begravd is
En..buried ice. Fr..glace enfouie. Ge..begrabenes Eis. It..ghiaccio sepolto. Sp..hielo enterrado. Sw..begravd is. Ru..погребенный лед [pogrebennyi led].

blokkhav (→ blokkmark)

blokkmark
En..block field. Fr..champ de blocs.

Fig. 5. Sample of the Norwegian version.

åderis
En..vein ice. Fr..glace de fissure. Ge..Veneneis. It..ghiaccio di vena. No..åreis. Sp..hielo de veta. Ru..жильный лед [zhil'nyi led].

aggradationsis
En..aggradational ice. Fr..glace d'agradation (d'accroissement). Ge..Aggradationseis. It..ghiaccio di aggradazione. No..aggradasjonsis. Sp..hielo agradacional. Ru..аградационный лед [agradatsionnyi led].

aktiv blockglaciär
En..active rock glacier. Fr..glacier rocheux actif. Ge..aktiver Blockgletscher. It..rock glacier attivo. No..aktiv steinbre. Sp..glaciar de detrito activo. Ru..активный каменный глетчер [aktivnyi kamennyi gletcher].

aktiv iskil
En..active ice wedge. Fr..coin de glace actif. Ge..aktiver Eiskeil. It..cuneo di ghiaccio attivo. No..aktiv iskile. Sp..cuña de hielo activa. Ru..растущая ледяная жила [rastushchaia ledianaia zhila].

aktiv termokarst
En..active thermokarst. Fr..thermokarst actif. Ge..aktiver Thermokarst. It..termocarsismo attivo. No..aktiv termokarst. Sp..termocarst activo. Ru..активный термокарст [aktivnyi termokarst].

aktiva konstruktionsmetoder i permafrost
En..active construction methods in permafrost. Fr..méthodes actives de construction dans le pergélisol. Ge..aktive Bauverfahren für Permafrost. It..metodi attivi di costruzione nel permafrost. No..aktive konstruksjonsmetoder i permafrost. Sp..métodos activos de construcción en permafrost. Ru..активные методы строительства на вечной мерзлоте [aktivnye metody stroitel'stva na vechnoi merzlote].

aktivt lager
En..active layer. Fr..couche active. Ge..Auftauboden. It..strato attivo. No..aktivt lag. Sp..capa activa. Ru..деятельный слой [deiatel'nyi sloi].

aktivt lager tjocklek
En..active-layer thickness. Fr..épaisseur de la couche active. Ge..Auftaubodenmächtigkeit. It..spessore del strato attivo. No..aktivt lager mektighet. Sp..espesor de la capa activa. Ru..мощность деятелъного слоя [moshchnost' deiatel'nogo sloia].

aktivt luftkyld kylpåle
En..active air-cooled thermal pile. Fr..pieu thermique à circulation d'air froid. Ge..Kühlpfahl mit Luftzirkulation. It..pilone termico attivo raffreddato ad aria. No..aktiv luftavkjølt termopel. Sp..pila térmica activa a circulación de aire frío. Ru..термосвая с активным охлаждением воздухом [termosvaia s aktivnym okhlazhdeniem vozdukhom].

aktivt vätskekyld kylpåle
En..active liquid-refrigerant thermal pile. Fr..pieu thermique à réfrigérant liquide. Ge..Kühlpfahl mit flüssigem Kühlmittel. It..pilone termico attivo a refrigerante liquido. No..aktiv væskeavkjølt termopel. Sp..pila térmica activa a refrigerante líquido. Ru..термосвая с активным охлаждением жидкостью [termosvaia s aktivnym okhlazhdeniem zhidkost'iu].

akustiskt bestämd permafrost (→ isbunden permafrost)

alass
En..alas / alass. Fr..alass. Ge..Alas / Alass. It..alas. No..alass. Sp..alass. Ru..алас [alas].

albedo
En..albedo. Fr..albedo. Ge..Albedo. It..albedo. No..albedo. Sp..albedo. Ru..альбедо [al'bedo].

alpin permafrost
En..mountain permafrost. Fr..pergélisol alpin. Ge..Hochgebirgspermafrost. It..permafrost alpino. No..fjellpermafrost. Sp..permafrost de montaña. Ru..горная вечная мерзлота [gornaia vechnaia merzlota].

altiplanationsterrass (→ kryoplanationsterrass)

altitudinell permafrostgräns
En..altitudinal permafrost limit. Fr..limite altitudinale de pergélisol. Ge..altitudinale Permafrostverbreitungsgrenze. It..limite altitudinale del permafrost. No..høydeavhengig permafrostgrense. Sp..límite altitudinal del permafrost. Ru..высотная граница вечной мерзлоты [vysotnaia granitsa vechnoi merzloty].

annuell frostkulle (→ tjälkupol)

annuell frostkulle (→ tjälkupol)

årlig 0-amplitudsnivå (→ djup för årlig 0-amplitud)

årlig frost
En..seasonal frost. Fr..gel saisonnier. Ge..saisonale Gefrornis. It..gelo stagionale. No..sesongmessig frost. Sp..congelamiento estacional. Ru..сезонная мерзлота [sezonnaia merzlota].

årlig tjäle
En..seasonally frozen ground. Fr..gélisol saisonnier. Ge..saisonaler Frostboden. It..terreno stagionalmente gelato. No..sesongmessig frossen grunn. Sp..suelo congelado estacional. Ru..сезонномерзлый грунт [sezonnomerzlyi grunt].

årligt tjälat/upptinat lager (→ aktivt lager)

årligt upptinad mark
En..seasonally thawed ground. Fr..sol dégelé selon des saisons. Ge..saisonal aufgetauter Boden. It..terreno stagionalmente disgelato. No..sesongmessig tinet grunn. Sp..suelo descongelado estacional. Ru..сезонноталый грунт [sezonnotalyi grunt].

årsmedel marktemperatur
En..mean annual ground temperature. Fr..température annuelle moyenne du sol. Ge..Jahresmitteltemperatur des Bodens. It..temperatura media annua del terreno. No..årlig middel grunntemperatur. Sp..temperatura media anual del suelo. Ru..среднегодовая температура грунта [srednegodovaia temperatura grunta].

årsmedel markytetemperatur
En..mean annual ground-surface temperature. Fr..température annuelle moyenne de la surface. Ge..Jahresmitteltemperatur der Bodenoberfläche. It..temperatura media annua della superficie (del terreno). No..årlig middel overflatetemperatur. Sp..temperatura media anual del superficie. Ru..среднегодовая температура поверхности грунта [srednegodovaia temperatura poverkhnosti grunta].

Fig. 6. Sample of the Spanish version.

аградационный лед [agradatsionnyi led]
En..aggradational ice. Fr..glace d'agradation (d'accroissement). Ge..Aggradationseis. It..ghiaccio di aggradazione. No..aggradasjonsis. Sp..hielo agradacional. Sw..aggradationsis.
аградация вечной мерзлоты [agradatsiia vechnoi merzloty]
En..permafrost aggradation. Fr..agradation du pergélisol. Ge..Permafrost-Aggradation. It..aggradazione del permafrost. No..permafrostutvidelse. Sp..agradación del permafrost. Sw..permafrosttillväxt.
агрегатная криогенная микроструктура [agregatnaia kriogennaia mikrostruktura]
En..fragmic cryogenic fabric. Fr..microstructure cryogénique angulaire. Ge..fragmisches kryogenes Gefüge. It..struttura criogenica a frammenti. No..fragmisk kryogenetisk fabric. Sp..fábrica criogénica frágmica. Sw..fragmenterad kryogen struktur.
агрегатоподобная криогенная микроструктура [agregatopodobnaia kriogennaia mikrostruktura]
En..fragmoidal cryogenic fabric. Fr..microstructure cryogénique subangulaire. Ge..fragmoïdales kryogenes Gefüge. It..struttura criogenica fragmoidale. No..fragmoidal kryogenetisk fabric. Sp..fábrica criogénica fragmoidal. Sw..fragmoidal kryogen struktur.
активная зона (→ деятельный слой) [aktivnaia zona (→ deiatel'nyi sloi)]
активная мерзлота (→ сезонная мерзлота) [aktivnaia merzlota (→ sezonnaia merzlota)]
активные методы строительства на вечной мерзлоте [aktivnye metody stroitel'stva na vechnoi merzlote]
En..active construction methods in permafrost. Fr..methodes actives de construction dans le pergélisol. Ge..aktive Bauverfahren für Permafrost. It..metodi attivi di costruzione nel permafrost. No..aktive konstruksjonsmetoder i permafrost. Sp..métodos activos de construcción en permafrost. Sw..aktiva konstruktionsmetoder i permafrost.
активный каменный глетчер [aktivnyi kamennyi gletcher]
En..active rock glacier. Fr..glacier rocheux actif. Ge..aktiver Blockgletscher. It..rock glacier attivo. No..aktiv steinbre. Sp..glaciar de detrito activo. Sw..aktiv blockglaciär.
активный термокарст [aktivnyi termokarst]
En..active thermokarst. Fr..thermokarst actif. Ge..aktiver Thermokarst. It..termocarsismo attivo. No..aktiv termokarst. Sp..termocarst activo. Sw..aktiv termokarst.
алас [alas]
En..alas / alass. Fr..alass. Ge..Alas / Alass. It..alas. No..alass. Sp..alass. Sw..alass.
альбедо [al'bedo]
En..albedo. Fr..albedo. Ge..Albedo. It..albedo. No..albedo. Sp..albedo. Sw..albedo.
альтипланационная терраса (→ криопланационная терраса) [altiplanatsionnaia terrasa (→ krioplanatsionnaia terrasa)]
атмосферный индекс промерзания [atmosfernyi indeks promerzaniia]
En..air freezing index. Fr..indice de gel de l'air. Ge..atmosphärischer Gefrierindex. It..indice di gelo nell'aria. No..lufts fryseindeks. Sp..índice de congelamiento del aire. Sw..frostindex i luften.
атмосферный индекс протаивания [atmosfernyi indeks protaivaniia]
En..air thawing index. Fr..indice de dégel de l'air. Ge..atmosphärischer Auftauindex. It..indice di disgelo nell'aria. No..lufts tineindeks. Sp..índice de descongelamiento del aire. Sw..töindex i luften.
байджерах (→ термокарстовый бугор) [baidzherakh (→ termokarstovyi bugor)]
бугор (→ бугор пучения) [bugor (→ bugor pucheniia)
бугор-могильник (→ термокарстовый бугор) [bugor-mogil'nik (→ termokarstovyi bugor)]
бугор пучения [bugor pucheniia]
En..frost mound. Fr..butte cryogénique. Ge..Frost-Hügel. It..monticello criogenico. No..frosthaug. Sp..domo de congelamiento. Sw..frostkulle.
бугор, сложенный вечномерзлым грунтом (→ бугор пучения [bugor, slozhennyi vechnomerzlym gruntom (→ bugor pucheniia)]
булгуннях [bulgunniakh]
En..closed-system pingo. Fr..pingo en système fermé. Ge..Pingo vom geschlossenen System. It..pingo a sistema chiuso. No..lukket system pingo. Sp..pingo de sistema cerrado. Sw..sluten system pingo.
булгуннях (→ бугор пучения; пинго) [bulgunniakh (→ bugor pucheniia; pingo)]
валиковый полигон [valikovyi poligon]
En..low-centre polygon. Fr..polygone à centre concave. Ge..Polygon mit konkaven Zentrum. It..poligono concavo. No..lavsenter polygon. Sp..polígono con centro deprimido. Sw..lågcentrumpolygon.
валунное поле (→ глыбовое (каменное) поле) [valunnoe pole (→glybovoe (kamennoe) pole)]
верхняя поверхность вечной мерзлоты (→ кровля вечной мерзлоты) [verkhniaia poverkhnost' vechnoi merzloty (→ krovlia vechnoi merzloty)]
весовое содержание воды [vesovoe soderzhanie vody]
En..gravimetric water content. Fr..teneur en eau gravimétrique. Ge..gravimetrischer Wassergehalt. It... No..gravimetrisk vanninnhold. Sp..contenido de agua gravimétrico. Sw..gravimetriskt vatteninnehåll.
вечная мерзлота [vechnaia merzlota]
En..permafrost. Fr..pergélisol. Ge..Permafrost. It..permafrost. No..permafrost. Sp..permafrost. Sw..permafrost.
вечная мерзлота альпийская (→ горная вечная мерзлота) [vechnaia merzlota al'piiskaia (→ gornaia vechnaia merzlota)]
вечная мерзлота, выделяемая по акустическим методам (→ вечномерзлый грунт, сцементированный льдом) [vechnaia merzlota, vydeliaemaia po akusticheskim metodam (→ vechnomerzlyi grunt, stsementirovannyi l'dom)]
вечная мерзлота под дном моря (→ подводная вечная мерзлота) vechnaia merzlota pod dnom moria (→ podvodnaia vechnaia merzlota)]
вечная мерзлота под морским дном (→ подводная вечная мерзлота) [vechnaia merzlota pod

Fig. 7. Sample of the Swedish version.

acción de congelamiento y descongelamiento (→ acción del congelamiento)

acción del congelamiento
En..frost action. Fr..gélivation. Ge..Frostwirkung. It..azione del gelo. No..fryseprosess. Sw..frostprocesser. Ru..криогенные процессы [kriogennye protsessy].

acuiclusa criogénica
En..cryogenic aquiclude. Fr..piégeage aqueux cryogénique. Ge..kryogener Grundwasserstauer. It..acquiclude criogenico. No..kryogenetisk akviklude. Sw..kryogen akviclud. Ru..криогенный водоупор [kriogennyi vodoupor].

agradación del permafrost
En..permafrost aggradation. Fr..agradation du pergélisol. Ge..Permafrost-Aggradation. It..aggradazione del permafrost. No..permafrostutvidelse. Sw..permafrosttillväxt. Ru..аградация вечной мерзлоты [agradatsiia vechnoi merzloty].

agua de intrapermafrost
En..intrapermafrost water. Fr..eau intrapergélisol. Ge..Intrapermafrostwasser. It..acqua di intrapermafrost. No..intrapermafrost vann. Sw..intrapermafrostvatten. Ru..межмерзлотные воды [mezhmerzlotnye vody].

agua de poros
En..free water. Fr..eau libre. Ge..freies Wasser. It..acqua libera. No..fritt vann. Sw..fritt vatten. Ru..свободная вода [svobodnaia voda].

agua de subpermafrost
En..subpermafrost water. Fr..eau infrapergélisol. Ge..Subpermafrostwasser. It..acqua di sottopermafrost. No..vann under permafrosten. Sw..subpermafrostvatten. Ru..подмерзлотные воды [podmerzlotnye vody].

agua de suprapermafrost
En..suprapermafrost water. Fr..eau suprapergélisol. Ge..Suprapermafrostwasser. It..acqua di soprapermafrost. No..vann over permafrosten. Sw..suprapermafrostvatten. Ru..надмерзлотные воды [nadmerzlotnye vody].

agua interfacial
En..interfacial water. Fr..eau d'interface. Ge..adsorbiertes Wasser. It..acqua di interfaccia. No..partikkelbundet vann. Sw..hygroskopiskt vatten. Ru..межчастичная вода [mezhchastichnaia voda].

agua intersticial
En..pore water. Fr..eau interstitielle. Ge..Porenwasser. It..acqua interstiziale. No..porevann. Sw..porvatten. Ru..поровая вода [porovaia voda].

agujero de fusión (→ dolina de descongelamiento)

alass
En..alas / alass. Fr..alass. Ge..Alas / Alass. It..alas. No..alass. Sw..alass. Ru..алас [alas].

albedo
En..albedo. Fr..albedo. Ge..Albedo. It..albedo. No..albedo. Sw..albedo. Ru..альбедо [al'bedo].

arroyo en cuentas de rosario (→ drenaje en cuentas de rosario)

asentamiento por descongelamiento
En..thaw settlement. Fr..tassement dû au dégel. Ge..auftaubedingte Setzung. It..assestamento da disgelo. No..tinesynkning. Sw..upptiningssättning. Ru..осадка при оттаивании [osadka pri ottaivanii].

asentamiento por fusión de hielo (→ asentamiento por descongelamiento)

banda no seleccionada
En..nonsorted stripe. Fr..traînée sans triage. Ge..nichtsortierter Streifen. It..striscia non selezionata. No..usortert stripe. Sw..osorterad sträng. Ru..несортированная полоса [nesortirovannaia polosa].

barrera cero
En..zero curtain. Fr..période zéro. Ge..Nullschleier. It..periodo zero. No... Sw..nollhorisonten. Ru..нулевая завеса [nulevaia zavesa].

base de la capa activa (→ frente de descongelamiento)

base del permafrost
En..permafrost base. Fr..plancher du pergélisol. Ge..Permafrostuntergrenze. It..base del permafrost. No..permafrostbasis. Sw..permafrostbas. Ru..подошва вечной мерзлоты [podoshva vechnoi merzloty].

bulbo de congelamiento
En..frost bulb. Fr..manchon de gel. Ge..Frost-Aureole. It..nucleo di gelo. No..frostutsvelling. Sw..frostbulb. Ru..ореол промерзания [oreol promerzaniia].

bulbo de descongelamiento
En..thaw bulb. Fr..bulbe de dégel. Ge..Tau-Aureole. It..bulbo di disgelo. No..tineboble. Sw..töbulb. Ru..ореол протаивания [oreol protaivaniia].

caida retrogresiva de descongelamiento (→ deslizamiento regresivo por descongelamiento)

caída del suelo por fusión (→ deslizamiento por descongelamiento; ruptura por despegamiento)

calor latente (de fusión)
En..latent heat (of fusion). Fr..chaleur latente (de fusion). Ge..Schmelzwärme. It..calore latente (di fusione). No..latent (tine)varme. Sw..latent (fusions)värme. Ru..скрытая теплота (плавления) [skrytaia teplota (plavleniia)].

calor latente de fusión volumétrico
En..volumetric latent heat of fusion. Fr..chaleur latente volumique de fusion. Ge..volumetrische Schmelzwärme. It..calore latente volumetrico di fusione. No..volumetrisk latent tinevarme. Sw..volumetrisk latent fusionsvärme. Ru..объемная скрытая теплота плавления [ob'emnaia skrytaia teplota plavleniia].

campo de bloques
En..block field. Fr..champ de blocs. Ge..Blockfeld. It..campo di pietre. No..blokkmark. Sw..blockfält. Ru..глыбовое (каменное) поле [glybovoe (kamennoe) pole].

cantidad relativa de hielo
En..iciness. Fr..teneur en glace apparente. Ge..Eisigkeit. It..tenore in ghiaccio. No..isethet. Sw..skenbar isinnehåll. Ru..льдистость [l'distost'].

capa activa
En..active layer. Fr..couche active. Ge..Auftauboden. It..strato attivo. No..aktivt lag. Sw..aktivt lager. Ru..деятельный слой [deiatel'nyi sloi].

capa criótica (→ permafrost)

capa de congelamiento y descongelamiento anual (→

Fig. 8. Sample of the Russian version.

International visibility of Northern journals: a citation study of Finnish scientific and scholarly periodicals

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Abstract: The international orientation of Finnish scientific and scholarly periodicals was studied using a modified impact factor to describe the international visibility of a journal. Other variables of interest were factors that might have influence on the international visibility of a journal, such as publication language, emission of bibliographical information, number of foreign contributors, as well as features of the journal, such as circulation and number of articles published yearly. The majority of the journals studied can be characterized as national domestic journals. Journals published in Finnish and Swedish mostly belonged to this group. One part of journals published in English and in German - although not all of them - could be considered as relatively visible among international audience. These journals represented either natural sciences, agriculture, or medicine.

Key words: citation analysis, impact factor, scientific periodicals, international visibility, Nordic countries, Finland

Introduction

The focus of this study is on the role played in international scientific communication by scientific and scholarly periodicals from a small northern country. Earlier studies have shown that research articles written by Finnish authors and published outside the Nordic countries are cited more frequently than those published in Finnish or Nordic journals (for example Garfield 1979, Luukkonen-Gronow & Suutarinen 1988). The role of national, scientific or scholarly journals in international scientific communication has often been discussed, especially in small and/or peripheral countries. From the Northern point of view this has previously been studied by Suutarinen (1980), Järvinen & Pietiäinen (1988), Luukkonen (1989), and Sivertsen (1991) among others.

This study attempts to examine international orientation among Finnish scientific and scholarly journals, to observe their international visibility through citation analysis, and to discuss factors that might have an influence on the latter.

The term international orientation is adapted from Sivertsen (1991) who studied Nordic scientific and scholarly journals. He calls a journal internationally oriented if it is published in some international (not Nordic) language, but the majority of its articles comes from the country of the chief editor. In Sivertsen's definition a journal can be considered international if both its publication language and contents are international, and the editor-in-chief comes from outside the Nordic countries. This study includes three journals that were included in Sivertsen's research. Among the various factors that might influence the citation rate of a journal, previous studies have focused on size (Garfield 1983) and language (Czerwon & Havemann 1993).

Materials and methods

The material for this study consists of 111 Finnish scientific or scholarly periodicals. Of these 30 represent the social sciences, 21 the humanities, 26 the natural sciences, and 34 were drawn from the applied sciences including medicine, agriculture and technology. The journals were described by the following variables:

- -language(s) of publications,
- -number of issues and articles published in the years 1980, 1985, 1989 and 1990,
- -year of foundation,
- -the number of articles written or coauthored by foreign scientists whose organization is outside Finland (hereafter referred to as "foreign articles"),
- -the frequency of occurrence in the files of the Dialog system as derived from the file Dialog Journal Name Finder, and
- -the number of foreign citations in 1991 referring to articles published in 1989 and 1990. Citations in articles published by the journal itself were excluded.

The term impact factor (JCR) is defined as the mean number of citations per article given to a certain journal in a period of two years after its publication. In this study a modified impact factor (MIF) was used to measure the international visibility of the journals. It is calculated in the following way:

$$\text{MIF} = \frac{\text{foreign citations in 1991 for articles from 1989 \& 1990}}{\text{number of articles from 1989 \& 1990}}$$

The MIF differs from the impact factor in that the number of citations is only for foreign authored; articles where Finland was the geographical location of the author were excluded. However, this did not exclude articles where a Finnish author is not the first author.

Results

1. Publication language

In 1990 about half (49) of the journals studied were published in English and the other half (54) in Finnish. Six journals were published in Swedish and two in German. Some of the journals published articles in more than one language. Figure 1 shows the distribution of publication languages in the years 1980 and 1990. The figure presents both the distribution of the primary and secondary publication languages, and, therefore, the total number of occurrence of different languages is 195 in 1980 and 175 in 1990.

The proportion of English as the primary publication language has grown slightly, from 40% to 44% during the decade, whilst other languages have decreased (Fig. 1). At the same time the practice of publishing articles in more than one language has also decreased.

In their recent study on articles published in English and German, Czerwon & Havemann (1993) did not find any clear or regular influence of publication language on citation rate. Our study includes two other languages that have a much smaller number of speakers. Consequently, Table I shows rather clear differences in the average MIF values of the journals published in different languages. Journals published in domestic (Nordic) languages have been cited much less frequently on average than those published in English or German.

Table I. Primary publication language and the average value of the modified impact factor.

	English	Finnish	German	Swedish
Average MIF	0.73	0.10	0.29	0.01

Publication language alone does not, however, make a journal internationally visible.

2. Foreign contributors

The presence of foreign contributors in a journal can also be used as an indicator of international visibility since this assumes that a scientist knows the journal well enough to send an article to it. In 1980 the journals in this survey published articles mostly written by domestic authors. At least 90% of articles were by domestic contributors in two thirds of the journals and in only 10% of the journals more than half of the articles were written by foreign scientists. In ten years the last figure has grown slightly (Fig. 2).

In regression analysis the best predictors of the MIF were the proportions of foreign articles published in a journal in 1980 and in 1985. The proportions were at their lowest in these early years (11% and 16% on average), but those journals which have become most internationally visible had already published some foreign articles (Table II).

Table II. Foreign contributions in 1985 and modified impact factor.

MIF	Proportion of foreign contributions				
	0-10%	11-30%	31-50%	51+%	Total
0-0.49	63	16	8	6	93
0.5-0.9	2	-	1	2	5
1+	-	4	7	2	13
Total	65	20	16	10	111

When comparing the proportion of foreign articles in journals published in different languages, the groups of domestic and international languages can be noted again (Table III). In every year observed the proportion of foreign articles in journals published in Finnish was less than 6%. According to the MIF values, publication language, and proportion of foreign authored articles in a journal, this group can be characterized most clearly as domestic national journals. The figures for journals that are published in German are influenced by *Neuphilologishce Mitteilungen*, which is a linguistics journals with a very international character. In 1980, 19% of the articles in journals published in English were foreign authored. Ten years later the proportion was 28%.

Table III. Primary publication language and average proportion of foreign authored articles published in 1989 and 1990.

	English	Finnish	German	Swedish
Proportion of foreign articles	28.2%	5.0%	82.5%	17.4%

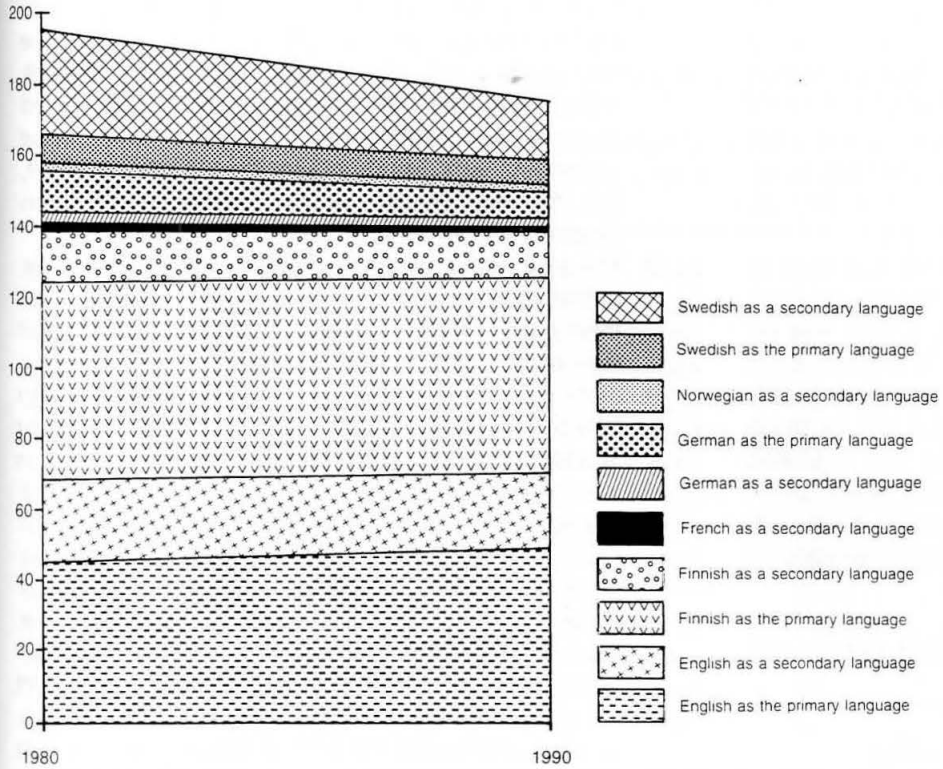

Fig. 1. Distribution of publication languages in 1980 and 1990.

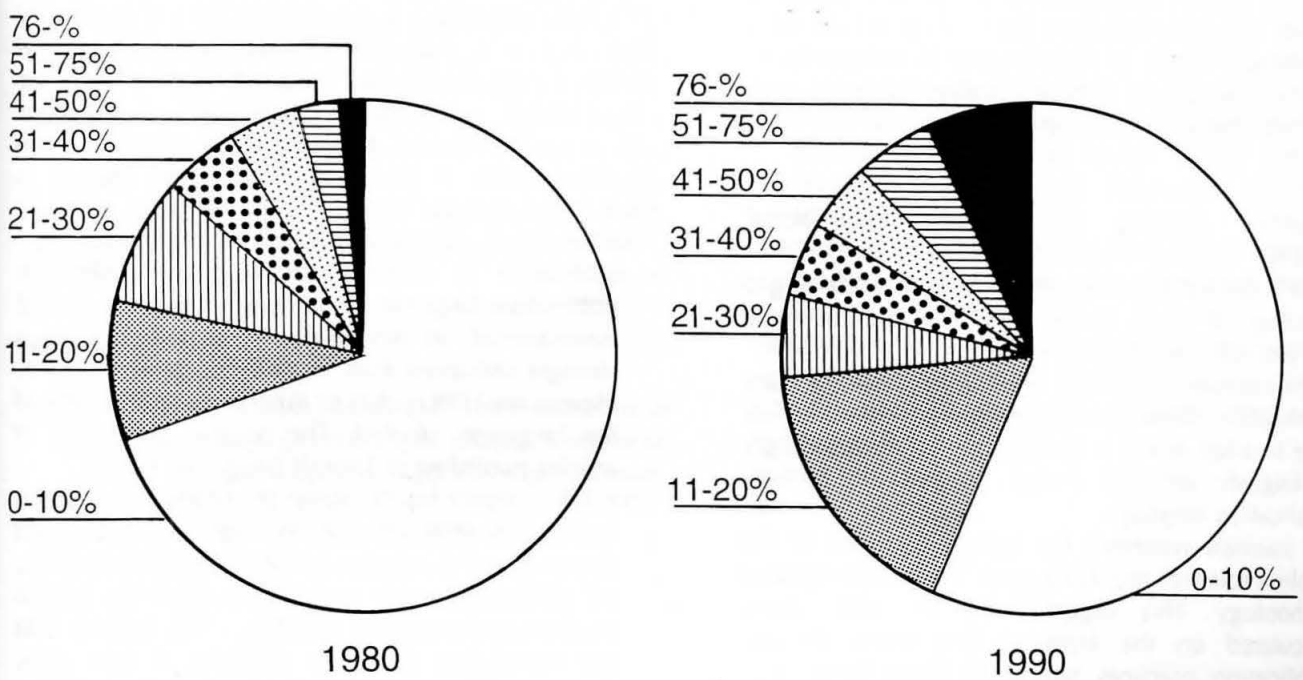

Fig. 2. Proportion of foreign articles in 1980 and 1990.

3. Circulation and bibliographic information

Journals with English as the primary language published on the average 24 articles yearly and their circulation was 1465 copies, whereas journals published in Finnish contained 50 articles annually and their circulation was 2790 copies. For journals like these, oriented to an international audience, whose circulation is limited, bibliographic information may be important.

Dialog Journal Name Finder (file 414) was used to study the quantity of bibliographic information on these journals. The occurrence in the Dialog system was on the average 827 for journals published in English, 1226 for those published in German, but it was as high as 580 also for journals published in Finnish and 323 for those published in Swedish. Occurrence in the files of Dialog does not correlate strongly (0.14) with MIF. Nevertheless, in Table IV a larger proportion of journals with high MIF also had more frequent occurrence in Dialog than the rest of the journals.

Table IV. Frequency in the files of Dialog and the MIF value.

MIF	Frequency in the files of Dialog 0-400	%	401+	%	Total
0-0.99	72	(73)	26	(27)	98
1-	5	(38)	8	(62)	13
Total	77		34		111

SCI, SSCI and A&HCI are bibliographic files on which citation analyses are based. Eight of the periodicals studied belong to their selection. Inclusion to them did not, however, raise the citation rate of all of these journals. Three of them belong to the top fifteen list arranged according to the MIF value (Table V), while others had relatively low citation rates.

4. Journals showing the strongest international orientation

In Table V the top fifteen journals are listed according to descending MIF value. Some observations can be made on the journals presented in Table V.

1. All the journals except one use English as the primary publication language. The exceptional one is *Suo* [The Swamp], which publishes its articles increasingly in English, although Finnish is still the primary publication language.
2. All journals represent the natural sciences or the applied sciences including agriculture, medicine and technology. This suggests that the MIF value, calculated on the basis of two years, favours publication practices typical to these fields. The figures for the journals representing the humanities and the social sciences might be enhanced if the MIF would be based on a period of five years. On the basis of some other criteria as well, the journals could be divided into two groups: A representing the humanities and the social sciences, and B representing the natural sciences and the applied sciences. Such variables are occurrence in the Dialog system (A: 101-258, B:510-3190), MIF (A:0.04-0.09, B:0.19-0.46), English as the primary publication language (A: 33-38%, B: 47-62%).
3. The two top journals and also some others have published such a small number of articles yearly that their high MIF value does not, however, mean that they have a wide audience abroad.
4. There were three journals for which it was possible to find the impact factor value given by the Institute for Scientific Information (JCR). In all these cases there is a contradiction between the MIF value and the impact factor value. The latter is based on all citations, whereas the former is based only on those given by foreign authors. Nevertheless, impact factor value is lower than the MIF. This can only be explained by the way in which citations were searched in the SCI, SSCI and A&HCI files. Impact factor value is obviously based only on one way to write or abbreviate the title of the journal, whereas when searching for citations for this study an attempt was made to find all possible abbreviations - and there were a lot of them - with the help of the *expand* -command of the Dialog system. Especially long titles, like *Annales Zoologici Fennici*, were abbreviated in many ways.

Conclusions

This study attempts to give a view on the role of national journals from a small northern country in international scientific communication. The journals can mostly be characterized as national, and they have an important task as such. However, an international orientation can be distinguished in some journals and this appears to have grown stronger during the last ten years.

Four aspects of international orientation were studied:

- publication in international languages. Although publication language alone does not make a journal international, in this study it seemed to have a stronger influence than in the case of Czerwon & Havemann (1993), due to differences in the sizes of the languages studied. The relative proportion of articles published in English has grown slightly.
- modified impact factor. About ten of the 111 journals in the study received relatively high modified impact factors based on citation of foreign authored papers. All of these journals represented either the natural sciences or the applied sciences, which suggests that the calculation based on citations of two years favours publication practices typical of these fields.
- proportion of foreign articles published in a journal. The number or the proportion of foreign authors who

Table V. Top fifteen periodicals listed according to MIF in descending order.

Title	MIF	Number of citations	% of citations	Articles 1989-90 foreign	I.F.	UDC	Language
Finnish Fisheries Research	5.14	148	96	7		63	En
Acta Botanica Fennica	4.11	226	85	9		5	En
Suo	3.62	1087	93	29		5	Fi
Fennia	3.00	588	69	10		5	En
Annales Zoologici Fennici	2.73	4238	82	95	0.5	5	En
Ornis Fennica	2.39	1397	85	31		5	En
Annales Chirurgiae & Gynaecologiae	2.14	4282	78	95		61	En
Karstenia	1.73	312	91	15		5	En
Geological Survey of Finland Bulletin	1.67	121	66	12		5	En
Annales Botanici Fennici	1.60	1994	66	68	0.3	5	En
Bulletin of Geological Society of Finland	1.52	120	79	23		5	En
Finnish Game Research	1.50	253	79	14		63	En
Annals of Medicine	1.32	2376	64	140	0.7	61	En
Geophysica	0.87	42	95	15		5	En
Silva Fennica	0.80	565	68	54		63	En

use the journal as a publication channel could also be considered as an indicator of international visibility.

- the amount of bibliographical information on the journal in international databases is of especial importance for journals having a limited circulation.

These four factors seemed to support each other. Journals published in international languages had the highest values of other indicators of international orientation. With respect to factors describing the size of a journal, the biggest journals in the study were oriented to the national audience and published in Finnish. Consequently, factors describing the size of the journal were not correlated with the indicators of international visibility. Only the age of the journal had some influence: the youngest journals, founded after 1960, were less frequently cited than the older ones.

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What are the needs of polar library users? The CASP Initiative

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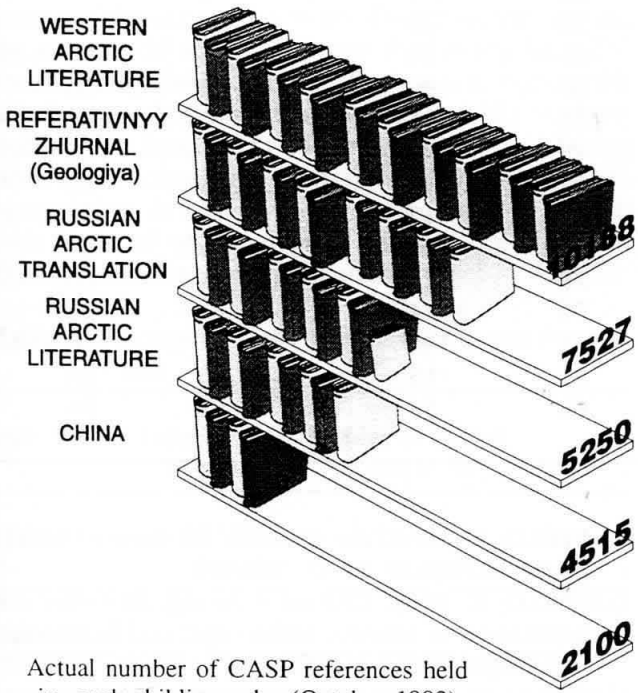

Actual number of CASP references held in each bibliography (October 1993)

Percentage of CASP references held in each bibliography (October 1993)

Fig. 1. CASP's computerised bibliographies contain 29 500 references. In addition, the library has some 35 000 references on Arctic geology recorded on cards prior to computerisation.

The Cambridge Arctic Shelf Programme (CASP) is a non-profit, independent research organisation, supported by industry and located in the Department of Earth Sciences, University of Cambridge. The CASP Information Centre is a recognized resource for literature in the polar and geological communities. The Centre is a literature depository and maintains a citation archive on cards and computer. It provides a current awareness of the geology of the earth's resources in the Arctic regions as well as regions of the former Soviet Union and China. The growth of the Information Centre has paralleled the expanding interests of CASP.

The Arctic Library is at the root of the CASP Information Centre. It originated as a direct response to the research requirements of geologists studying the geology of Svalbard. Literature backup required for this work was the beginning of the CASP Arctic Library. Indeed the geology of Svalbard is the essence of CASP itself which had its origin in the University of Cambridge Earth Sciences Department, when in 1930s Mr. W. Brian Harland organized the Cambridge Spitsbergen Expeditions.

The Information Centre aims to maintain a current awareness of relevant geological literature and research by *gathering* and *distributing* information for use by our in-house geologists and subscribers. The task of *gathering* information is greatly aided by the network of libraries in Cambridge: the University main library, the Scientific Periodicals Library, the Scott Polar Research Institute, the British Antarctic Survey and the University's Earth Sciences Department.

The Library shares its information by *distributing* keyworded current-awareness bibliographies (see Figs. 1 & 2) and translations to its subscribers. Some 5000

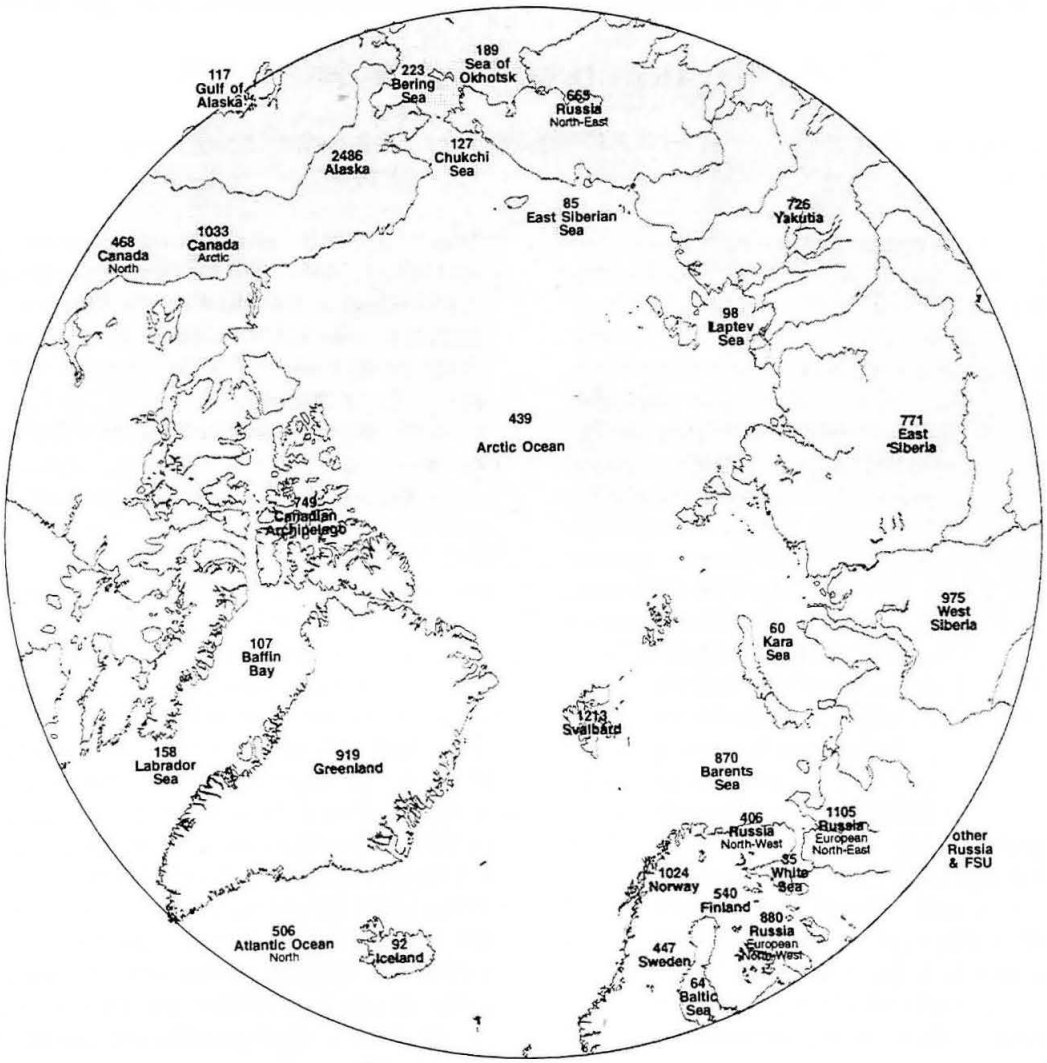

Fig. 2. Regional distribution of keywords for Arctic Regions accumulated on the CASP Bibliographic Database (as of February, 1994)

references are cited in our bibliographies:

A List of Arctic References in Western Languages Excluding Russian;

A Selection of Arctic Geology Entries from Referativnyy Zhurnal (Geologiya);

A List of Current Arctic Geological Literature in Russian;

A List of Russian Geological Translations; and

A List of Chinese References.

The Russian Arctic has been prominent in the research history of CASP and we actively translate Russian literature in order to provide research backup. Our most recent project *A Directory of Russian Geoscientists* is intended to encourage international understanding and scientific cooperation.

Information resources available at World Data Centre-C for glaciology

AILSA D. MACQUEEN

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WDC-C for Glaciology is responsible for maintaining the comprehensive collection of books, conference proceedings, reprints, published and unpublished reports, theses and periodicals which form the glaciological section of the Library of the Scott Polar Research Institute. This collection includes approximately 1000 books and conference proceedings, and 5000 reprints, together with all major journals covering general glaciology, snow, land and sea ice, frozen ground engineering, glacial geology and permafrost. There are currently over 20 000 references to glaciological literature on the SPRILIB bibliographical database, searchable at WDC-C or on the "Arctic and Antarctic Regions" CD-ROM (NISC). WDC-C is funded by the Royal Society.

All scientists with glaciological interests are welcome to make use of the collection and other services designed specifically to meet the needs of remote users.

Environmental data system in Finland

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In Finland environmental data is collected by different authorities, institutions and universities. According to the latest environmental statistics handbook (1991) issued by the Statistical Office of Finland, there were 48 organizations that published a total of 165 environmental registers or statistics. Some of these include more than one register, e.g the database "Hydrological Statistics" is in fact 12 different registers.

The periods covered by these registers vary widely. The oldest observations are from the first half of the 19th century, the most recent start after 1990. The increase of environmental interests in the 1970's can be seen even in these statistics. Data collection started with 55 registers, but 35 new ones have been started.

The Environmental Data System (EDS) was founded to solve the problem of how to reach the centralised data that is collected (and published) by different authorities and other organisations. EDS includes about 50 data and referral registers and also GIS-registers based on satellite pictures and digital map data. The system is managed by the Environmental Data Center (EDC) which is a part of the National Board of Waters and the Environment (NBWE). The data in the EDS is collected and recorded mostly by the NBWE, but also by other organisations. It was founded to help in researching, monitoring, controlling, planning, and assessment of the environment. It also gives information about ongoing research projects, completed research projects and other publications and articles. EDS is a public service which can be used on-line. Data and results can also be ordered via EDS.

EDC also acts as the EC/EEA National Focal Point and it is responsible for the Baltic Monitoring Programme (BMP) of the Helsinki Commission (HELCOM), and for the UN/ECE Integrated Monitoring database. It also works as the secretariat for environmental monitoring and data co-operation, (supervised by the Nordic Council of Ministers) and also co-ordinates development of the regional information network between Finland and the adjacent areas in Eastern Europe (eg Russia, the Baltics etc.).

EDS was initiated in the 1990s but old data have also been recorded. The relational data registers of the system contain more than 35 million individual numerical identifications, measurements and observation. The referral registers include about 46 000 references. From the referral databases, data is transferred by the Information Unit of the Technical Research Centre (VTT) to the international databases BALTIC and ASFA.

Collected data is also used to produce thematic maps, eg. by combining EDS data and satellite information. A Hypermedia Service Application has been produced but it is only for internal use by the Environment Administration at the moment.

The present data registers in EDS can be summarised in the following groups: 1) air pollution control, 2) biodiversity, 3) chemicals, 4) hydrology, 5) limnology, 6) nature conservation, 7) publications, 8) research activities, 9) water pollution, and 10) water and waste water treatment.

The biggest data producers are:

- the environmental authorities (NBWE, its districts, the Ministry of the Environment)
- provincial governments
- communes
- the polluters themselves
- research institutes (eg Geological Survey of Finland, Finnish Meteorological Institute, Finnish Institute of Marine Research, Finnish Forest Research Institute, Agricultural Research Centre)
- other authorities (eg National Land Survey of Finland, Map Centre etc)
- Universities, private water protection associations etc.

The library of NBWE is responsible for the referral databases, eg:

- KIRJAT (collections of the library)
- JUTTA (publications and articles and its personnel)
- TUPRO (research projects of the Water and Environment Research Institute, and projects financed by the Ministry of the Environment [NBWE in co-operation with the Ministry])
- An EXPERT database has been started, so far including only personnel from NBWE with its districts.

The database YMJULK (which includes publications by the Ministry of the Environment) also belongs to the "family". All these databases are "built" with TRIP programme and they can all be opened at the same time. The publications and projects are indexed with keywords (in Finnish) and NBWE library also uses UDC classification. KIRJAT does not include abstracts as the others do.

Although EDS has been built, it has not resulted in a reduction in publications based on environmental data. NBWE and other organisations publish weekly and

monthly reports and yearbooks. A comprehensive publication about the state of the Finnish environment came out in 1993. Similar publications will be published every third or fourth year. Environmental news is also given to the ordinary citizen every Sunday on TV.

The publications can be reached through two research library networks: LINNEA-libraries (VTLS) and OTANIEMI network (TRIP). LINNEA-libraries are 20 university libraries throughout the whole country. The database LINDA contains the National Bibliography of Finland and the collections of these 20 libraries, altogether about 1.7 million references. OTANIEMI network consists of two research institute libraries and Helsinki University of Technology Library. These databases include information about research activities, measurement data, and collections. They are searchable by a single connection. Both networks are public.

SPRILIB 2 - information retrieval at the Scott Polar Research Institute

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The Library of the Scott Polar Research Institute has, since 1985, been using a computerised catalogue, SPRILIB, which is implemented using the Muscat program package. Before 1985 the catalogue was available as a card index, with a large subject index organised under UDC category headings. The computerised catalogue carried over the UDC system, but also provided new retrieval methods based on free-text searching.

In fact SPRILIB scored something of a first in providing an implementation in a real library of probalistic information retrieval with query expansion and relevance feedback. What this means is that queries are presented in a simple free text form, the 'terms' or 'keywords' extracted from the query are assigned weights which derive from an underlying model of retrieval based on probability theory, documents are presented to the user in decreasing order of probability of relevance, and from the documents marked as relevant by the user ('relevance feedback'), the system can suggest additional query terms ('query expansion'), and form an improved order of the documents.

The first implementation of SPRILIB was on the IBM mainframe provided by the Cambridge University Computing Service. Nine years after the event SPRILIB 1, with its command-line user interface, seems very out of date. This year we are launching SPRILIB 2, and this will be demonstrated at the Colloquy. From the user's point of view, the information retrieval system has a much wider functionality, a much friendlier user interface, and brings back information very much faster. For the library, SPRILIB 2 also includes a whole system for the acquisition, accession and cataloguing of material, for producing statistics on library growth and for report generation.

At present SPRILIB 2 runs on a PC network using Windows for Workgroups, although with the high level of portability which has been achieved in Muscat 3.1, this is merely a detail.

More information on the Muscat software package and probalistic information retrieval can be obtained from Cambridge CD Publishing.

Operation Tabarin: the archives of a British Antarctic expedition in wartime

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Abstract: Operation Tabarin was a secret expedition to the Antarctic organised by the British Government in 1943, during World War II, primarily to provide a British presence to deter enemy raiders in the South Atlantic and to strengthen British claims to sovereignty of the Antarctic Peninsula. Scientific research was seen as the primary occupation of those manning the bases. Three bases were established in the British sector of Antarctica between 1944 and 1945, and scientific research and mapping were undertaken. This marked the beginning of continuous British research in Antarctica for, with the end of the war in Europe, the expedition was re-named the Falkland Islands Dependencies Survey and established on a permanent basis. In 1962 it became the British Antarctic Survey (BAS). The records created during Operation Tabarin have had a complex custodial history. Over the years they have been re-arranged, widely dispersed and finally brought together again in the archives of BAS. Consequently they form part of a surprisingly large number of archival series and illustrate the difficulties facing the archivist cataloguing such a group.

Key words: Antarctica, polar history, World War II, Operation Tabarin, Falkland Islands Dependencies Survey, British Antarctic Survey

Introduction

The records of Operation Tabarin, the predecessor of the British Antarctic Survey, are important source material for understanding the origins of the organisation and provide a case study of the dispersal and subsequent re-building of an archive group.

History of the expedition

Operation Tabarin was a secret expedition to the Antarctic organised by the British Government in 1943, during World War II. Its primary objectives were to ensure a British presence in the Antarctic to prevent harbours being used by enemy raiders and to strengthen British claims to sovereignty of the Falkland Islands Dependencies (now British Antarctic Territory, South Georgia and South Sandwich Islands). However, scientific studies were also planned and many of those recruited were scientists or surveyors.

The expedition was organised by the Admiralty and Colonial Office and directed by an inter-departmental committee in London and, once in the Antarctic, by the Governor of the Falkland Islands Dependencies in Stanley, Falkland Islands. Scientific work was guided by an advisory committee in London. James Marr, a marine biologist and Antarctic veteran, was appointed as expedition leader.

Sailing from Tilbury in November 1943 the expedition reached Stanley early in 1944, despite problems with the vessel chartered to carry it. From there HMS *William Scoresby* and SS *Fitzroy* took a wintering party of 14 men to establish two bases in the Antarctic Peninsula area. (Fig. 1). The first, Base B, was on Deception Island in the South Shetland Islands. It was intended that the second, Base A, would be on the mainland at Hope Bay but sea ice conditions prevented this and the base was finally established at Port Lockroy in the Palmer Archipelago.

Ill-health forced Marr to return to the UK early in 1945 and command of the expedition passed to Captain Andrew Taylor, a surveyor with the Royal Canadian Engineers. In February 1945, with the aid of an ice-strengthened vessel chartered for the purpose, a base was successfully set up at Hope Bay (Base D). (Fig. 2). The expedition was finally relieved in January 1946.

During Operation Tabarin, which marks the beginning of continuous British research in Antarctica, regular meteorological and sea ice observations were undertaken at all the bases. Additionally, each base concentrated on particular disciplines: marine biology, botany and mapping at Port Lockroy; geology and glaciology at Deception Island; and mapping and geology at Hope Bay. The use of sledge dogs at Hope Bay from 1945 greatly extended the range of journeys undertaken.

With the end of the war in Europe responsibility for the expedition was transferred to the Colonial Office as the Falkland Islands Dependencies Survey (FIDS). In 1962 FIDS was renamed the British Antarctic Survey and became an institute of the Natural Environment Research Council in 1967.

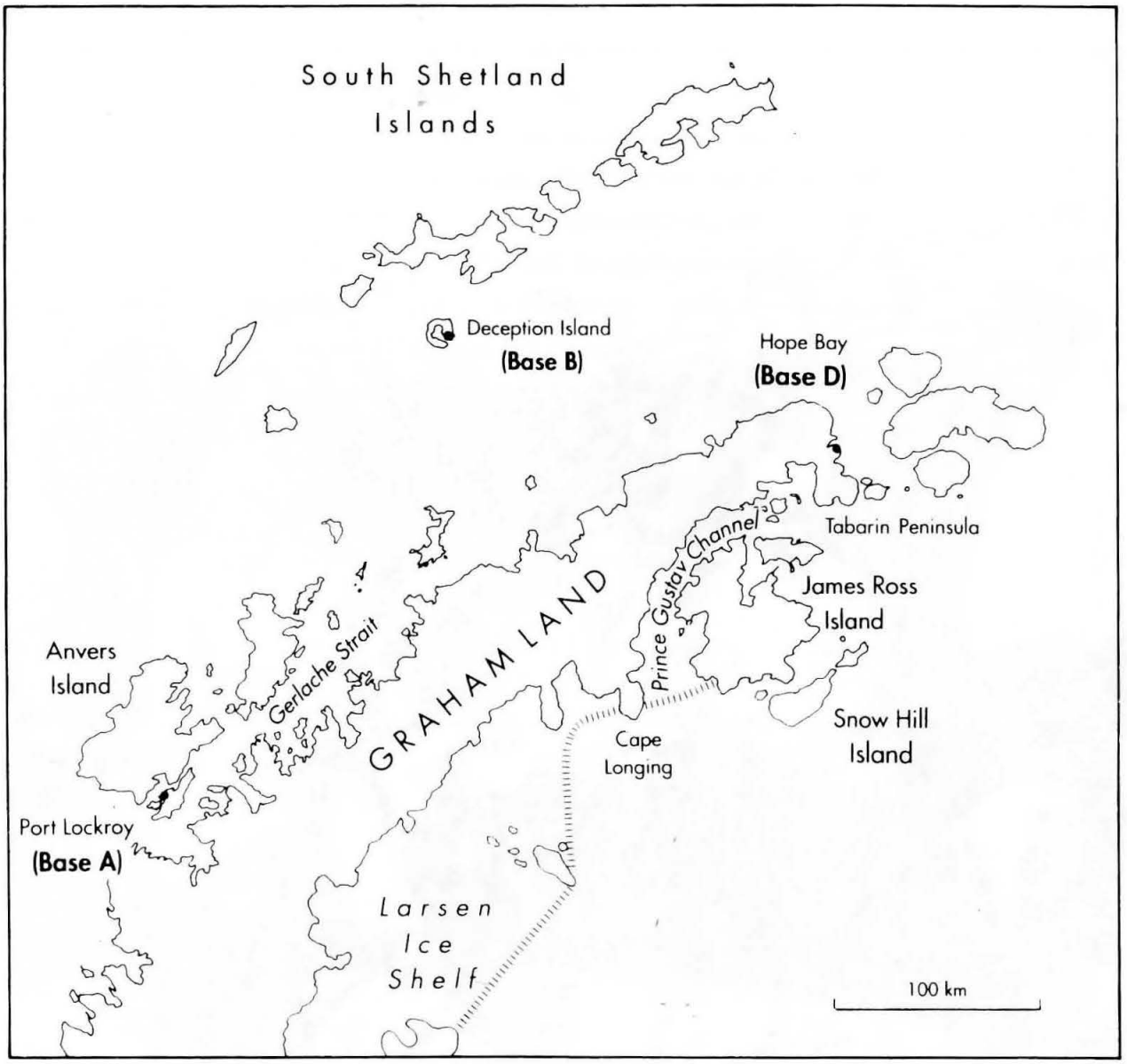

Fig. 1. The locations of Operation Tabarin bases.

Custodial history of the records

Operation Tabarin records have had a complex custodial history which illustrates how an archive may be dispersed, re-organised and re-united with the passage of time. The bulk of records generated by the expedition were created in the Antarctic and shipped to Stanley early in 1946. Each item was numbered and listed before transportation to the UK. In London the documents, in 10 cases, were taken to the Natural History Museum and stored by members of the Discovery Committee (a Colonial Office committee responsible for British marine research in the Southern Ocean from 1923-1959) who advised on the scientific activities of both Tabarin and FIDS. From there meteorological records were transferred to the Meteorological Office, Bracknell, whilst topographical survey data and maps were deposited at the Directorate of Colonial (later Overseas) Surveys (DOS).

In 1950 Operation Tabarin records still at the Museum were transferred to the newly created Falkland Islands Dependencies Scientific Bureau. The Bureau, set up in London to oversee the writing-up of FIDS' scientific findings and to manage records returned to the UK, established specialist scientific units within universities around the country. Relevant records were passed to units in Birmingham (geology and botany), London (zoology), Edinburgh (meteorology) and Cambridge (glaciology). Copies of reports covering a number of subjects were sent to several units, whilst others were split up into sections according to discipline.

The process of dispersal was reversed with the establishment of BAS's administrative and scientific headquarters in Cambridge in 1976, when the bulk of the records were concentrated on one site. Three years later the Archives Service was created to make the

Fig. 2. Members of Operation Tabarin aboard SS *Eagle*, February 1945, *en route* to Hope Bay.

records more readily accessible and provide professional curation.

The last major consignments of Operation Tabarin records to BAS Archives were in 1980 and 1984. These were, respectively, administrative files created by the Governor of the Falkland Islands Dependencies (until then kept as part of the Governor's archive) and the survey records formerly at DOS.

Curation and cataloguing

Operation Tabarin records at BAS are stored in archival quality boxes in air-conditioned accommodation, purpose-built in 1988. Those damaged have been professionally repaired and the cine film copied ontovideo tape for security and improved accessibility.

The records have been sorted and classified with due respect to both the original arrangement, imposed by dispersal and subsequent use, and their relationship to later records (they frequently initiate continuing series). (Fig. 3). They have been catalogued on a computer database using the archive application of MODES (Museum Object Data Entry System) software. This listing was finalised in the course of a year except for the photographs (totalling over 2000 images), which were completed as a separate project several years later. (Fig. 4).

Using the indexing facility of the database an overview of the Operation Tabarin archive at BAS can easily be obtained. Moreover, by including in the item descriptions cross-references to the original 1946 listing it has been possible to reconstruct relationships between documents which have long been separated. This has clarified the existence in different series of multiple and partial copies of the same record and aided identification of records now housed elsewhere or missing.

Operation Tabarin records in BAS Archive series	
AD6/1	Annual reports on science and logistics by expedition members
AD6/1/ADM	Expedition leaders' copies of administrative papers
AD6/15	Personal records given to BAS by expedition members (memoirs, press cuttings etc.)
AD6/16	Cine film and oral history recordings
AD6/19/1	Photographic negatives and prints
AD8/1	Administrative files of the Governor of the Falkland Islands Dependencies
ES2/EW	Topographical survey data and maps
ES2/SY	Surveyors' non-technical records
ES3/GY	Geologists' scientific records
ES3/REG	Geological specimen registers and station lists
LS/BL	Biologists' scientific records
LS/REG	Biological specimen registers and station lists

Fig. 3. List of the record series in BAS Archives containing Operation Tabarin material.

Fig. 4. Cataloguing the photographs taken during Operation Tabarin.

A Russian/English dictionary of permafrost terms

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During the 5th International Permafrost Conference, held in Trondheim (Norway) in August 1988, the Council of the International Permafrost Association (IPA) authorised the establishment of a Terminology Working Group. Its mandate was "to develop a set of internationally accepted permafrost terms for use in engineering and science, with equivalents in various languages, and to disseminate and encourage the use of such terminology." The Terminology Working Group was established in the fall of 1988, with members from Argentina, Canada, China, Finland, France, Germany, USA, and the former USSR. Continuation of the Working Group with additional members from Italy, Sweden and Norway, for the period 1993-98, was approved during the 6th International Permafrost Conference in Beijing (China) in July 1993.

In 1991, N.N.Romanovsky, V.N.Konishchev and G.Rozenbaum (Moscow State University) started work on a Russian-English dictionary of geocryology and related scientific fields. An initial draft was circulated in 1992, followed by an expanded version in 1993. The latest draft, containing more than 3000 terms, was circulated for comments in early 1994.

Some editing of the English entries was performed by van Everdingen, who also transformed the disk file of the dictionary into a Wordperfect (version 5.1) database to enable production of both Russian/English and English/Russian versions. The dictionary is maintained as a master list of records, in which each record comprises two fields: 1) a Russian term, and 2) its English equivalent. The database can be sorted alphabetically for either of the two languages. Small files of layout specifications are then used to prepare separate versions of the dictionary for each language, with the terms in the selected language as the prime entries. In this single-column format, each version is 142 pages long. The number of pages can be reduced to 57 by adoption of a two-column format. A utility program (Lines, Boxes, etc from MAP Systems, Houston) is used by the second author to enhance print quality and printing speed on dot-matrix printers. Currently, the dictionary database file occupies 610 154 bytes on diskette; individual language versions with layout specifications occupy 948 875 bytes on diskette.

Definitions and comments are now being added to the dictionary by the Russian authors. Transliterations of Russian terms, from the Cyrillic alphabet to the Latin alphabet, using the Library of Congress system, may be added at a later date for the convenience of non-Russian users.

SPRI Oral History Project

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In 1992 the Polar History Group of the Scott Polar Research Institute established an Oral History Project, the purpose being to provide an audio visual record of the people who have either worked in the polar regions or have contributed to polar science or exploration.

In April 1992, Shirley Satwell and Maria Pia Casarini-Wadhams took the opportunity of making the first video in the SPRI Oral History Project Series. This was an in-house amateur recording of an interview with the Rev. Harold Duncan, former Missionary at Pond Inlet, Baffin Island, 1929-34. Many people who have worked in the polar regions have no written record of their experiences and a video recording of this nature provides a valuable and permanent record of their experiences which might otherwise be lost. This particular video complements the collection of artifacts and lantern slides that the Rev. Duncan gave to the institution in 1989.

A small fund was then set up to cover the basic costs of future productions. Recently we have been grateful for the expertise of a professional film maker and friend of the institute, Christopher Warren who operated as both cameraman and editor. With the continuing help of Christopher Warren, the SPRI Oral History Project was able to make the following two films:

Mrs.Evelyn Forbes.

Mrs Evelyn Forbes' father Hartley Travers Farrar was the geologist on Scotts first expedition of 1901-04 and was described by Loius Bernacchi as being a "pioneer of Antarctic geology." Ferrar Glacier was name after him following his discovery of it in November 1902 while searching for the western mountains in Antarctica. Mrs Forbes has many memories of her father as well as a number of interesting artefacts from the expedition. She was also a great friend of Oriana Wilson, the widow of Edward Wilson, the doctor and artist on Scotts expeditions. As a result of their friendship, Evelyn helped to sort out Edward Wilson's sketchbooks and papers. The third section of the interview deals with her husband Max Forbes who was Librarian at SPRI and Editor of the Polar Record. He was also appointed as British Observer on Operation Deep Freeze.

Dr.Terence Armstrong.

He was appointed as a Research Fellow at SPRI at a time when the Institute was being transformed from being a branch of the Admiralty Intelligence to being a part of the University of Cambridge. During his long career at the Institute, he has moved from being a Russian linguist to being a very distinguished economic and social geographer. His main field of interest is the Northern Sea Route and for many years he compiled an annual report for shipping. He has travelled widely in the former Soviet Arctic and was responsible for setting up links between SPRI and the former Soviet Union and for establishing the Russian section of the Institute's Library.

Who are our users? Public and internal use of the British Antarctic Survey Archives Service

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Introduction

One of the earliest formal definitions in the English language of what constitutes an archival document states that it is one made in "the course of an administrative or executive transaction .... of which itself formed part; and subsequently preserved .... for their own information by the person or persons responsible for that transaction and their legitimate successors" (Jenkinson 1937, p 11). The nature of the future use of an archival document is an integral part of this definition, and Jenkinson sees such use as being primarily by the creating organization.

Subsequent definitions, in contrast, have incorporated the importance of secondary use, usually historical research (Schellenberg 1956, p 16, Cook 1977, pp 1-2). In practice certainly, these later definitions are reflected in the experience of the majority of archive services, which look to meeting historical research needs of members of the public as their main justification.

The British Antarctic Survey exists in a legal framework which, in line with the majority of archival services, stresses the provision of public access to its older records, whether administrative, logistical or scientific. Nevertheless, analysis of statistics reveals that by far the major part of the use made of the records is in fact by current staff. This demonstrates that the primary value of the B.A.S. Archives Service is in meeting the requirements of its parent organization.

Legal setting for B.A.S. Archives Service

Prior to 1967 BAS and its predecessor, the Falkland Islands Dependencies Survey, had been the responsibility of the Colonial Office and then the Commonwealth Relations Office. As a result of being part of a Government department, the Survey's records were public records under the Public Records Act, 1958. In 1967 the Survey was transferred to the Natural Environment Research Council (NERC), which is Government-funded but not part of a Government department. NERC's records are not public records, and therefore BAS records created after this date are not protected by statute. However, the position of the Survey's pre 1967 records was unaffected by the transfer, and in respect of these BAS must comply with the requirements of the Public Records Act, and is supervised by the Public Record Office (PRO) acting on behalf of the Lord Chancellor, the responsible minister.

In view of their largely scientific nature and their organic relationship with post-1967 records, it has been considered inappropriate for the Survey to transmit its earlier records to the PRO as they become twenty-five years old, as is normal practice in government departments. BAS has therefore been appointed a "place of deposit" for its own records under the Public Records Act (Section 4(1)) on the grounds that suitable facilities exist for, amongst other things, "their inspection by the public". Such facilities are later defined as arrangements "comparable to those made .... in the Public Record Office" (Section 5(5)). In setting up an Archives Service in 1979, BAS management was focusing on the administrative and scientific needs of accessing information held in various accumulations of records, which in some cases dated back over three decades. These backlogs had been centralized in the new Cambridge headquarters some three years earlier from various locations around the UK. Meeting legal obligations was not a core issue, although the development of the service to meet management requirements, in terms of sorting and organising the records, providing adequate finding aids and proper storage accommodation, also went much of the way towards meeting requirements under the Public Records Act. In fact searchers from outside BAS have always been accommodated, subject of course to the "thirty year rule", ie restrictions on access to public records less than thirty years old.

Use made of the archives

Statistics of use made of the archives have been maintained continuously since the Service moved into its present accommodation in 1988. Amongst other things, these record the number of archives items produced from storage for consultation by BAS staff and visitors. These statistics have been summarized and analyzed in the adjoining charts. They show the absolute numbers of items produced from storage to meet external and internal requests, and also their relative proportions. Internal requests are subdivided into administrative and scientific, which respectively equate to Jenkinson's administrative and executive use.

The proportion of items used by visitors varies widely from year to year, but at its maximum represents about a fifth of the total use of archives, and is more typically between 3.9% and 6.6%. Use by scientists is never less than 42.9% of the total, is usually over 50% and can be almost 75%. It is always in excess of the figure for administrative use. The figures also demonstrate a more than twofold increase in the overall level of use since 1988. No attempt has been made to correlate the numbers of items used with the numbers of users.

Certain caveats have to be made concerning the interpretation of the statistics. Firstly, the figures hide the difficulty, found in any archives office, of quantifying documents consulted. In practice what are counted are the number of items produced for use from storage, whether single documents or multiple units such as a whole box, rather than the actual number of pieces consulted. However, it can be assumed that this phenomenon affects all types of users and does not distort the relative positions of one type as against another.

Secondly, and more importantly, the figures relate not only to the production of archives proper, ie records to be kept permanently, but also to records which are not due for permanent preservation or which have not yet been appraised. The latter category of records would be held in a separate records centre in larger organizations, but in BAS both categories of material are managed by the Archives Service in a single store. One can be reasonably certain that almost by definition the external user will only be accessing archives proper. On the other hand, most of the scientific records which are consulted are known to be of permanent value, and conversely it is also known that the major use of non-archival records is by administrative personnel.

Conclusions

Even allowing for difficulties in interpretation, the message of the statistics is clear. While provision is made for external use, as required by law, consultation of the archives is overwhelmingly internal, with a significant bias towards use by scientific staff rather than administrative. In this way, Jenkinson's concept of archives as material preserved primarily for the benefit of the parent organization, is at least partially supported in the context of BAS. In addition the Archives Service should be seen as a support to the Survey's core activity of scientific research more than an administrative convenience or a legal necessity.

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Reflection of exploration and development of the Euro-Arctic region in the archives of the Russian Academy of Sciences

ANATOLY VINOGRADOV, ELENA MAKAROVA and OLGA SHAMINA

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The Kola Peninsula is located above the Arctic Circle in tundra and forest tundra zones. Before the beginning of the 20th century it had a population of only 2-3000: the reindeer breeders - the indigenous people of Saami (Lapps), and Russian pomors - fisherman and hunters for sea animals. The first scientific expedition of Professor Louis Delisle de la Croyere, from Saint Petersburg Academy of Sciences, visited Arkhangelsk and the Kola Peninsula in 1727-1730. After the results of this expedition there was compiled the first Russian map of Russian Lapland, included in the Atlas of the Russian Empire in 1745.

The following expedition of a naturalist academician I.I.Lepekhin in 1772, collected considerable amount of information concerning the flora and fauna of the Kola Peninsula. The first investigator of the Khibiny massif is usually considered to be the famous Russian investigator of Northern and Eastern Siberia, academician A.F.Middendorf, who visited the Western slopes of the Khibiny mountains in 1840 on his way from Kola to Kandalaksha.

In the second quarter of the 19th century the Kola Peninsula was visited by a number of scientists: geologist Shirokshin (1839), botanist A.I.Shrenk and geologist G.N.Vetlingk (1839), scientist-naturalist academician K.M.Ber (1840), an outstanding linguist of the 19th century, and ethnography specialist in Finno-Ugric languages, M.A.Kastren and publisher of the Karelian-Finnish epos "Kalevala"

In 1869, the first Belomorian (White Sea) expedition was undertaken by the Department of Zoology of Naturalist Society under the St. Petersburg University. The result of the expedition was the establishment, on Professor N.P.Wagners initiative, in Solovky Islands in the White Sea, of a biological station. This was moved to Alexandrovsk (now Polyarny) in 1899, and became the first permanent scientific research organisation in the North of Russia.

During 1887-93 and 1896-97 expeditions of the English scientist William Ramsay and his companions Petrelius, Chilman and others discovered the Lovozero massif and compiled the first geologic, petrographic and mineralogic descriptions of the unique plutons of the Khibiny and Lovozero tundra.

Fig. 1. Members of the academic expeditions to the Kola peninsula - I.I. Lepekhin (left) and N.Ya. Ozeretskovsky (right)

Fig. 2. William Ramsay (1865 - 1926)

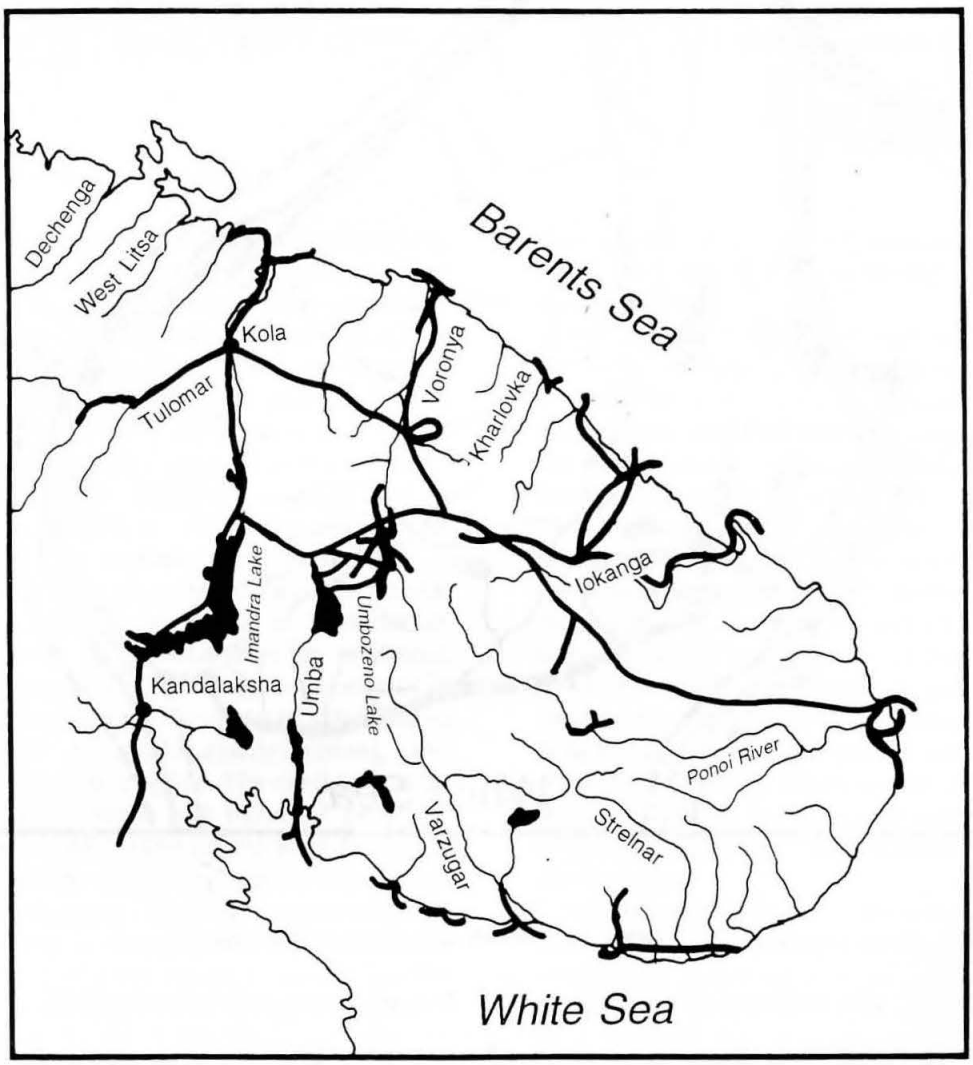

Fig. 3. Itineraries of Ramsey and Chilman on the Kola peninsula in 1887 and 1888.

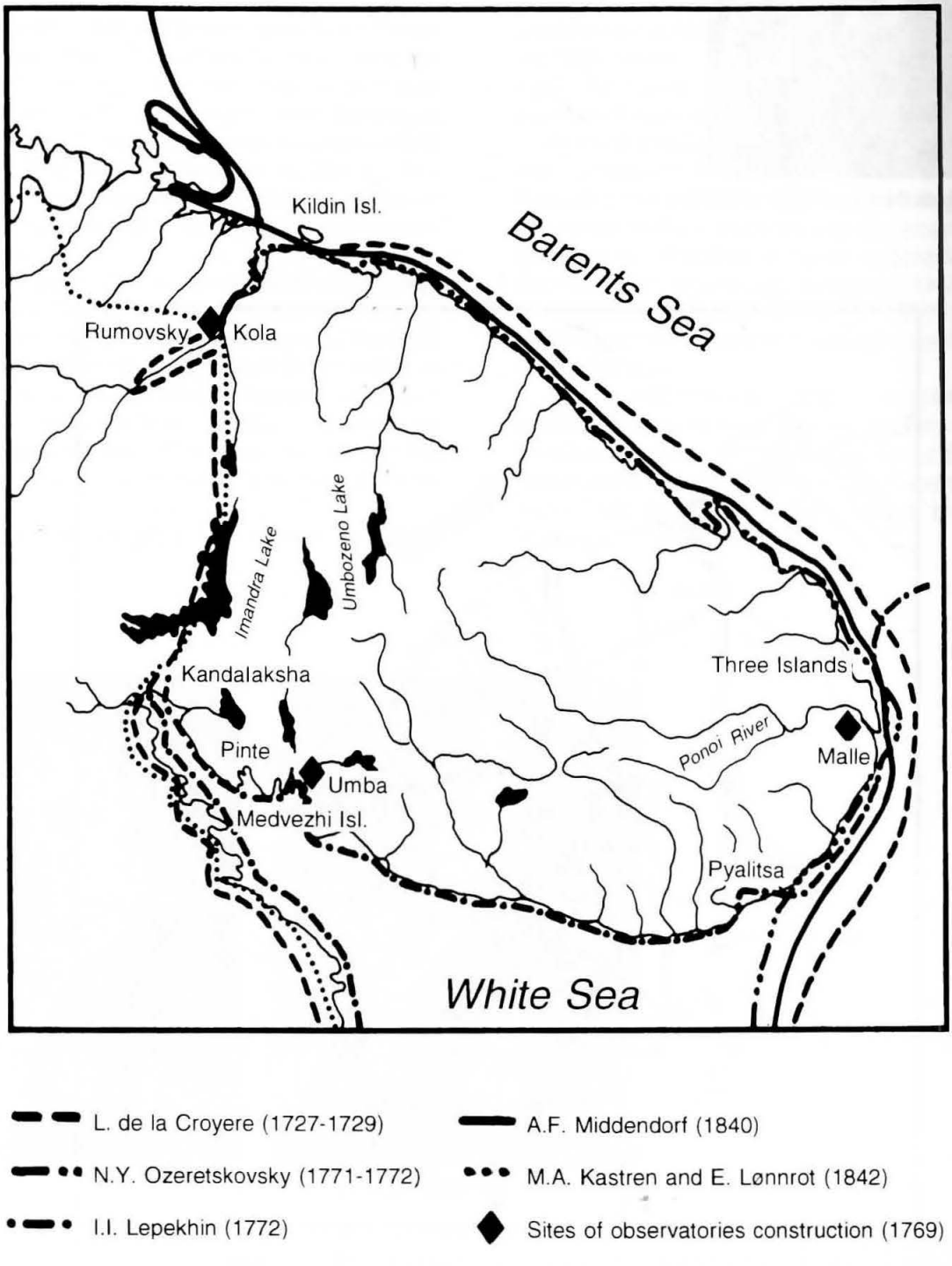

Fig. 4. Itineraries of scientific expeditions in the Kola area.

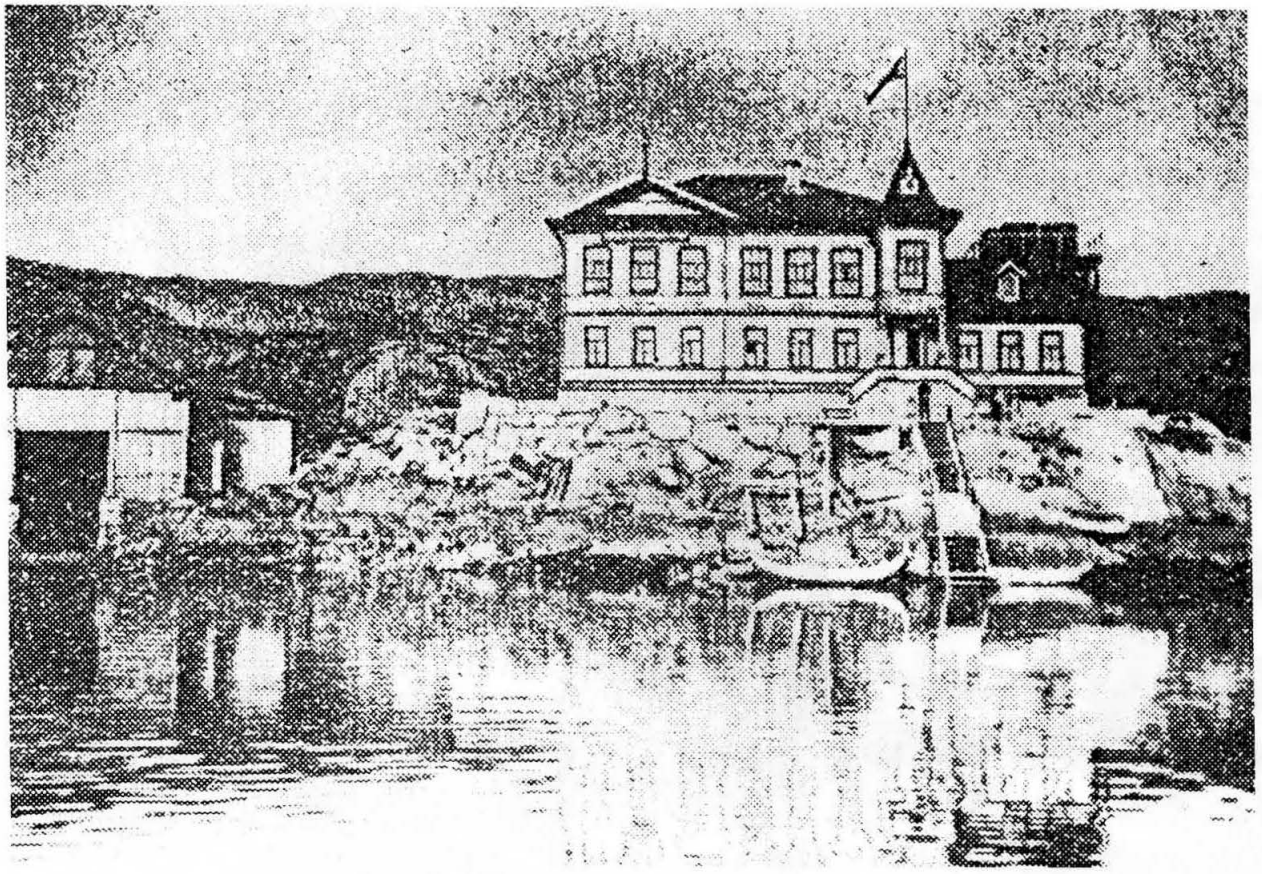

Fig. 5. Murmansk biological station

In 1898, on the instructions of Geographical Society, the first topographic works on the Kola Peninsula were carried out by P.V.Rippas and A.A.Noskov. In 1891-1903 academician E.O.Fedorov first discovered a rich apatite mineralization in the Kola Peninsula. In 1911-15, Professor A.A.Polkanov discovered deposits of iron ore in the NorthWestern part of the Kola Peninsula. The materials of these expeditions are kept in the scientific archives of the Russian Academy of Sciences and in Federal Archives in Moscow and St.Petersburg, and Municipal archives of Murmansk and Arkhangelsk.

Systematic geological research in the Kola Peninsula, resumed in 1920 under the leadership of academician A.E.Fersman, resulted in the discovery of enormous deposits of the apatite in Khibiny, copper-nickel ores in Monchetundra and some other minerals, which initiated the developmentof the high-capacity mining and metallurgic industries in this region. The need to find the solution to various scientific and technical problems brought about the establishment on the Kola Peninsula in October, 1930 of the permanent research institution of the Academy of Sciences - Khibiny Mountain Station, one of the first remote organizations of the Academy.

The activity of the polar-alpine botanical garden institute, included in the number of acting institutions of Academy of Sciences of the USSR, began in 1932. In late 1934, the Khibiny Mountain Station was reorganised into the Kola Scientific and Research Base of the USSR Academy of Sciences, and in 1935 the base was awarded the name of S.M.Kirov (a statesman of the pre-war USSR, who did much for the exploration of the Northern Russia).

During the World War II, the base staff, evacuated to Komi Republic, concentrated their efforts on the study of the Republic's productive capacity. The activities in Kirovsk were resumed in 1943, and some employees of the base stayed in Syktyvkar town and established the Komi Branch of the USSR Academy of Sciences.

A new stage of development of science in polar regions of Russia began by the end of the 1950s, when the Kola branch of the USSR Academy of Sciences was inaugurated in Apatity. It soon grew into the world's largest research centre north of the Arctic Circle. On April 20 1967, for important achievements in the development of science and productive capacity of the Kola Peninsula, the Kola branch was given the highest reward of the USSR. At present the Kola Science Centre (KSC) includes 11 institutes and a number of pilot plant production lines with a total number of employees over 3000 persons.

On November 26 1957 the scientific archive of the Kola branch of the USSR Academy of Sciences was established. The creation of the archive was undertaken in order to: concentrate in one place all documents left as a result of the activities of the branch (scientific, scientific and organizing and office work, book-keeping and personnel department documents), provide for their safety, their registration and their use without restrictions

Fig. 6. A.E. Fersman (second from left, standing) with colleagues

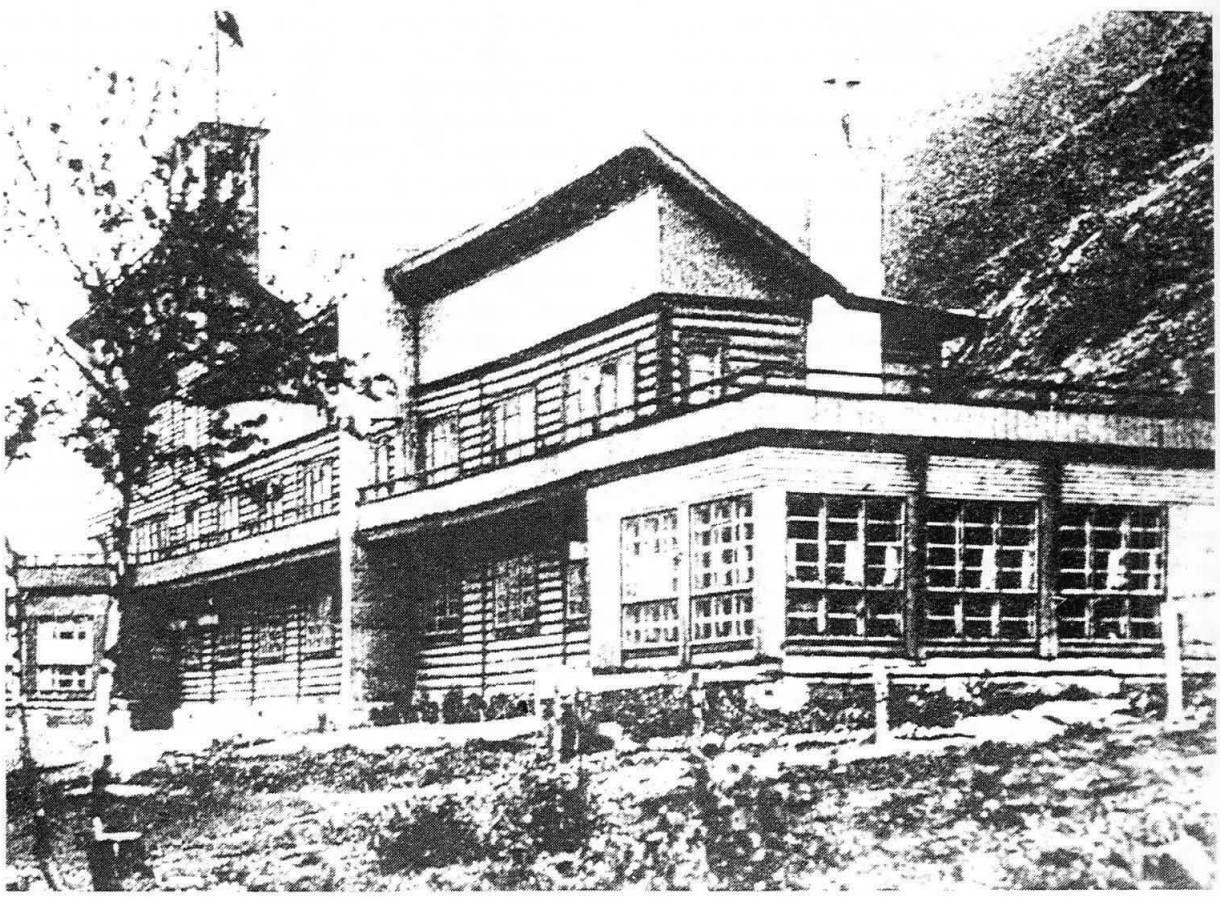

Fig. 7. The building of the Kola scientific research base, destroyed by fire in 1937.

Fig. 8. The Kola Science Centre of the Russian Academy of Sciences

for scientific and practical purposes. As the new institutes were established within the Kola branch of the USSR, the archive was enriched with materials from the newly established scientific institutions and the organisation of the branch. The scientific archive is a scientific auxiliary division, attached to the Presidium of the scientific centre and is subordinate directly to the main scientific secretary of the centre. There were also established departments of the scientific archive in the Polar-Alpine Botanical Garden Institute (Kirovsk), in Polar-Geophysical Institute (Murmansk, Loparskaya), Murmansk Marine Biological Institute (Murmansk), because of their distant locations.

The archive of the centre documents of previous activities in the administrative and managing divisions (office, personnel and post-graduate students department, accounts department, supply division, planning department, department of major construction etc.) as well as in scientific institutes: Geological, Institute of Chemistry and Technology of Rare Elements and Mineral Raw Materials, Mining Institute, Polar Geophysical Institute, Murmansk Marine Biological Institute and in particular departments eg. economic department, energetics department. The materials include:

a) manuscripts of scientific works, theses, authors proof-sheets, scientific reports, observation, research and test diaries, field registers, plans, schemes, maps, tables, diagrams, drafts, copies of archive documents, photographs, negatives, photographic films, microfilms, drawings, sketches, laboratory, expedition and other scientific and scientific-auxiliary documents;
b) scientific, bureaucratic and accounting materials of structural parts of the branch (centre) and of institutions dependent on it;
c) gift - materials from the personal collection of Professor P.N.Chirvinsky;

The particular status of the scientific archive of the KSC in the system of federal archives of Russia is determined by the fact that the archive is not subordinate to the Murmansk regional archive and, unlike other departmental archives, has the right of permanent retention of documents. The archive is only subordinate to the archive of the Russian Academy of

Sciences.

The scientific archive of the KSC of the Russian Academy of Sciences is mainly completed with non-published reports on the results of scientific and research activity and with primary materials to them. The information on the structure and contents of the materials of the scientific archive of the KSC of the RAS is included in the reference book "Documents of the State Archive Funds (SAF) of the USSR in libraries, museums and scientific departmental archives" published in 1991. At present the scientific archive of the Kola Science Centre of RAS includes 9 groups. Four further groups for recently established institutes are being formed.

The largest group N1 was formed while processing materials, describing the activity of the Station-Base-Branch-Centre, since the first day of the Khibiny Mountain station existence on July 20, 1930, up to the establishment of the Geological Institute (N2) within the Kola branch and further on to the materials of structural divisions of the branch, directly connected with the Presidium of the Branch-Centre. The materials of the Botanical Garden-Institute are the only exceptions, as these have always been kept in group N5.

The unpublished manuscripts, and materials with the status of manuscripts, of well-known scientists-pioneers: I.D.Batieva, I.V.Belkov, A.A.Chumakov, A.V.Galakhov, I.V.Ginsburg, G.I.Gorbunov, A.M.Ivanov, B.M.Kupletsky, S.S.Kurbatov, A.N.Labuntsov, A.A.Sakharov, P.I.Soustov, M.I.Volkova, O.A.Vorobieva are kept. The primary materials of science are of particular interest: field diaries, journals of registration of observations, experiments. Priceless historical sources - materials of various scientific conferences, stenographic reports of various councils sessions - are also well represented in the scientific archive. The archives latest acquisition is the rich fund of cinema-photo-phono materials concerning the history of science development on the Kola peninsula.

15th Polar Libraries Colloquy
Business Meeting July 6-7, 1994

Chaired by Nick Flanders
Summary prepared by Martha Andrews

Agenda

1. Constitution
2. Polar Libraries Bulletin
3. Pollib-l
4. Polar Libraries Directory
5. IPA
6. PLC Archives
7. Venue for the 16th PLC
8. Resolutions
9. Next Meeting

1. Constitution.

The constitution committee agreed at the 14th Polar Libraries Colloquy - William Mills (chair), Martha Andrews, Kay Shelton, Liisa Kurppa, Janice Meadows, Ross Goodwin - with input from others, had prepared a draft constitution which was distributed with the registration packets for 15 PLC. This draft was brought before the business meeting for consideration.

The Chairman stated that if the constitution was agreed, this business meeting would be closed and a second business meeting would be opened to carry on the business under the new constitution.

Phil Cronenwett explained the background, and the process of formulation of, the constitution, which had been under serious discussion since at least 1988. Group discussion followed on the pros and cons of having a constitution. Discussion of the constitution, article by article, was initiated.

Chapter Three, membership, provoked sufficient dissension that Sharon West moved to divide the question and approve the constitution chapter by chapter, delaying discussion on chapters not approved. The Colloquy agreed to this. Chapters One and Two were approved with a change of wording in two 3(ii).

Chapters Three and Four were opposed. The vote for three was Y-23, N-25, A- 2; the vote for four was Y-25, N-15, A-3. Since a two thirds majority was needed for passage, these two chapters were returned to committee for revision.

At this point it was moved and accepted that the remainder of the business meeting agenda be taken up next, and after that discussion of the constitution would continue. SEE AGENDA ITEMS 2-8 BELOW.

Chapter Five was approved. Chapter Six was reduced to one article, with the other two articles becoming a new Chapter Seven. A Chapter Eight was created; it reads exactly as Chapter Seven with 'bylaws' substituted for 'constitution.'

The revised Chapters Three and Four were presented at the continuation of the business meeting on Thursday, July 7. The constitution, as printed following this business meeting summary, was passed on Thursday, July 7.

2. Polar Libraries Bulletin. Kay Shelton, Alaska State Library

The bulletin costs approx. $1000/yr to print and mail to 225 people. William Mills and Lynn Lay have volunteered to become co-editors of the bulletin. Nita Cooke expressed the thanks of the Colloquy to Kay Shelton and Nancy Lesh for the great job they have done editing the bulletin for the past several years.

3. Pollib-l. Eric Tull, AINA, Univ. Calgary, Canada

Information was given about this new listserv organised by Eric Tull. More individuals are invited to sign up and contribute to this very useful service on the Internet.

4. Polar Libraries Directory. Martha Andrews, Ann Brennan, Liisa Kurppa.

Martha Andrews circulated copies of this new, updated directory and informed the group that it is selling for $25 per copy. Copies are available from Ann Brennan.

5. IPA (International Permafrost Association). Alan Heginbottom, GSC, Canada.

Alan Heginbottom acquainted the group with the IPA and spoke about a relationship between IPA and the Polar Libraries Colloquy whereby each group could keep the other informed about information activities. IPA offers access to information, and information on expertise. There is an IPA working group on data and information.

6. PLC Archives. Eugene West, UAF, Alaska, USA

Eugene West has investigated the situation of the PLC archives which were supposed to be housed at UAF. He found records there only for the 6th PLC which was held in Fairbanks in 1976. He encouraged the group, especially past Colloquy hosts, to send the archives from their meetings to UAF. Eugene also stated that he is not an archivist, and left open the question of processing the archives after receipt.

7. Venue for 16th PLC. Barbara Sokolov, UAA, Alaska, USA

Barbara Sokolov, Director of the Consortium Library at the University of Alaska Anchorage, read a letter from the UAA administration inviting the 16th Colloquy to meet there in 1996. The group accepted the invitation unanimously.

8. Resolutions

Three resolutions were presented and passed by the Colloquy. Copies follow this business meeting summary.

The business meeting was adjourned after passage of the constitution.

9. Next Meeting

The Chairman opened another business meeting in order to carry forward business generated from the passage of the constitution.

i. Bylaws. Full discussion of the bylaws took place, and they were passed with revisions (see copy attached at end of constitution).

ii. Elections. Nominations were opened for membership of the Steering Committee. Ten names were offered; nominations were then closed and the ten nominees were unanimously approved for membership on the steering committee. They are: William Mills, Kirsten Caning, Phil Cronenwett, Eric Tull, Martha Andrews, Sharon West, Valentina Markusova, Liisa Kurppa, Deidre Sheppard, and Klaus Hansen.

iii. Dues. The issue of dues had been discussed within the bylaws. Bylaw number four sets dues at five pounds sterling per year.

Nick Flanders adjourned the business meeting.

Constitution of the Polar Libraries Colloquy
Approved July 7, 1994

Chapter One
Name of the association
Article **1**
The name of the association is the Polar Libraries Colloquy.

Chapter Two
Aim and purpose of the association
Article **2**
The Polar Libraries Colloquy (hereafter called the PLC) provides a forum through which librarians and others evidencing an abiding interest in the collection, preservation, and dissemination of polar information, discuss issues of mutual concern and promote initiatives leading to improved collections and services.

Article **3**
In order to implement its aims, the PLC:

(i) holds an international conference every two years, or at an interval agreed upon by the membership;
(ii) exchanges information by appropriate means;
(iii) co-operates with other national and international organizations whose aims are complementary to those of the PLC.

Chapter Three
Membership
Article **4**
Membership of the PLC is open to all persons and institutions evidencing an abiding interest in the collection, preservation, and dissemination of polar information. There will be three categories of membership: individual, honorary, and institutional. The rights and privileges of each category shall be as defined in the bylaws. Applications for membership must be directed to the PLC Steering Committee.

Article **5**
Individual and institutional members must pay an annual membership fee. Honorary members shall pay no fees. Such fees will be as approved in the business meeting of the preceding Colloquy. The Steering Committee may agree to waive membership fees for a predetermined period upon application.

Article **6**
The status of Honorary Member may only be conferred by a proposal agreed to at the business meeting. Honorary members will enjoy all the rights and privileges of individual membership.

Chapter Four
Organization and administration
Article **7**
Decisions regarding the aims, purposes and functioning of the PLC are approved in the business meeting held during the international conference (hereafter called the business meeting).

Article **8**
The PLC's activities are directed and planned by the PLC Steering Committee which is elected at the business meeting to serve until the next business meeting. The PLC Steering Committee must have at least three and not more than ten members. These members shall, as far as possible, be chosen so as to be representative of the different regions and types of libraries comprising the PLC membership in general. The PLC Steering Committee shall elect officers from among themselves, one of whom shall be Chair, and one of whom shall be Secretary-Treasurer.

Chapter Five
Meetings
Article **9**
An international conference is held every two years, or other agreed interval. The venue and host organization are decided upon according to procedures stipulated in the Bylaws. An institution or site wishing to host the next PLC conference should inform the PLC Steering Committee at least sixty days prior to the business meeting.

Article **10**
The organization and financial arrangements of the international conference are the responsibility of the host organization, which shall also be responsible for the preparation, publication and distribution of the conference proceedings. Organizations hosting the international conference should budget to cover costs but not make a profit. Arrangements for the international conference should be made by the conference host in consultation with a conference organizing committee, the latter being selected at the preceding PLC business meeting. The role of the conference organizing committee is essentially consultative and supportive of the conference host, who retains primary responsibility for the making of conference arrangements.

Chapter Six
Entry into effect of this constitution
Article **11**
This Constitution will come into force at the close of the business meeting at which it is approved by a two-thirds majority of the members voting.

Chapter Seven
Changes to the constitution of the Colloquy
Article **12**
Amendments to the Constitution may be proposed by any member. Such amendments must be submitted in writing to the PLC Steering Committee in time for dissemination prior to the business meeting.

Article **13**
Adoption of an amendment requires an affirmative vote of at least two-thirds of the members present at the business meeting.

Chapter Eight
Changes to the Bylaws of the Colloquy
Article **14**
Amendments to the Bylaws may be proposed by any member. Such amendments must be submitted in writing to the PLC Steering Committee in time for dissemination prior to the business meeting.

Article **15**
Adoption of an amendment requires an affirmative vote of at least two-thirds of the members present at the business meeting.

Bylaws
1. For the purpose of the business meeting at which the adoption of this constitution will first be mooted (15th PLC, Cambridge), all delegates attending the business meeting will be considered as members with full voting rights.
2. The selection of the venue for the PLC conference will be recommended by the PLC Steering Committee for approval by the general membership at the business meeting. The tradition of alternating between the European and North American continents will be considered in venue selection with due consideration given to other regions as evidence of interest becomes apparent.
   The PLC Steering Committee will reach their decision taking into account the following factors:
   The prospective host should offer:
   i. a demonstrated, on-going commitment to the aims of the PLC;
   ii. the ability to provide a suitable venue including appropriate accommodation and meeting facilities, and relevant and interesting sites to visit;
   iii. a significant polar collection;
   iv. a record of successfully hosting international conferences;
   v. a letter of invitation from the director of the institution;
   vi. evidence of institutional commitment, both financial and physical;
   vii. a suitable theme for the conference;
   viii. a commitment to publish the proceedings.

   Consideration shall be given to appropriate sites which have yet to host the PLC conference.
3. Only individuals and honorary members may hold office. Members, whether individual, honorary, or institutional, all have only one vote.
4. Dues for individual and institutional members shall be five pounds sterling.

Resolutions of the 15th Polar Libraries Colloquy

Three formal resolutions were presented and approved by the 15th Polar Libraries Colloquy.

1. Resolved that the Colloquy offer its grateful thanks to our hosts - SPRI and BAS - and particularly to Pippa Hogg, Christine Phillips, David Walton, and William Mills!

2. Recognizing the need to expand the retrieval and access to information on the polar regions and specifically between individuals and organizations interested in the Russian North and Arctic, the 15th Polar Libraries Colloquy (PLC) meeting in Cambridge recommend the following future activities:
   i. Development and updating of a Russian Arctic Directory (RAD) on organisations and individuals be prepared by Russians in Russia.
   ii. Establish electronic mail links amongst Russian and non-Russian polar organisations.
   iii. Existing and new databases on polar organisations be made available on Internet, consolidated & updated.
   iv. PLC members voluntarily input to the Polar Information Directory (PID).
   v. Future Colloquy include invited and contributed papers on RAD & PID.
   vi. International and national funding be encouraged to support development of RAD.
   vii. Free exchange of published & grey literature between all PLC members on a cost for cost basis, to be balanced annually.

3. It is moved that the Polar Libraries Colloquy develop liaisons with other international organisations with interests in the Polar Regions, and in science, engineering, social sciences, arts and culture and information science in the polar regions.

Programme: 15th Polar Libraries Colloquy

Bi-polar information initiatives: the needs of polar research

Sunday 3 July 1994

17:00-20:00 Registration at Girton College
18:00 Reception
20:00 Lecture: H G R King - Historic Cambridge

Monday 4 July 1994

08:30 Welcome
08:40 John Heap (Director, Scott Polar Research Institute, University of Cambridge) - *The information needs of polar diplomacy*

Session 1: The polar information community: services to research

Chairperson: John Cooper (Fitzpatrick Institute, University of Cape Town)

09:00 Nicholas E Flanders (Institute of Arctic Studies, Dartmouth College) - *a theory of polar information.*
09:25 Martha Andrews (INSTAAR, University of Colorado) - *Are we information poor? Limitations to accessing polar literature.*
09:50 Ronald K Inouye (University of Alaska Fairbanks) - *Information needs of polar library users.*

10:15 Coffee

10:35 Nancy C Liston (CCREL) - *Cold regions science and technical information Analysis Center.*
11:00 Lea Karhumaa and Liisa Kurppa (University Library of Lapland and Arctic Centre) - *Arctic "know-how" at the University of Lapland.*
11:25 Inger Ahlström Bergström (Swedish Institute of Space Physics, Kiruna) - *the role of the IRF library in the expanding scientific community in Kiruna - a centre for space research in Sweden.*
11:50 Klaus Georg Hansen (Groenlandica, Nunatta Atuagaateqarfia Greenland) - *Research libraries in Greenland and the emerging scientific communities.*

12:15 Lunch

14:00 J Alan Heginbottom (Geological Survey of Canada) - *An annotated cartobibliography of permafrost maps.*
14:25 Bernard Stonehouse (SPRI) - *Polar tourism: do library resources meet researchers' information needs?*

Session 2: The polar information community: services to the general public

Chairperson: Liisa Kurppa (Arctic Centre, University of Lapland)

14:50 Robin Minion, Linda Seale and Elaine Simpson (Canadian Circumpolar Library, University of Alberta) - *A territory of Canada to be known as Nunavut.*
15:15 Julia Finn (Department of Indian Affairs and Northern Development) - *New directions at the Department of Indian Affairs and Northern Development Canada.*

15:40 Tea

16:00 Paivi Alanen (Public Library of Rovaniemi, Finland) - *Public Libraries serving diverse populations in the North: serving ethnic minorities in the Arctic.*

16:25 Barbara Sokolov (University of Alaska Anchorage) - *Delivery of health science information to rural Alaska: practices and problems.*
16:55 Lynn B. Lay (Byrd Polar Research Center) - *Juvenile polar literature: an assessment of holdings in libraries.*
17:20 Carol McDougall (SPRI) - *Just kids stuff? The place of children's books in a polar collection.*

19:00 Dinner

Tuesday 5 July 1994

Session 3: Polar archives: resources and opportunities

Chairperson: Philip Cronenwett (Dartmouth College)

08:30 Ann Savours Shirley - *Iron men and wooden ships: some sources for their history*
08:55 Anne Morton (Hudson's Bay Company Archives, Provincial Archives of Manitoba) - *Kathleen Shackleton and the Hudson's Bay Company.*
09:20 Jutta Voss (Alfred-Wegener Institute for Polar and Marine Research) - *The needs of polar research: Alfred Wegener and his Greenland expeditions. Collections of the Alfred Wegener Institute.* [This paper will be presented by Reinhard Krause]
09:45 Raimund E. Goerler and Richard Hite (Byrd Polar Research Center) - *Admiral Richard E. Byrd and history: an assessment of his papers at the Byrd Polar Research Center.*

10:15 Coffee

10:35 Ken Grossi (Ohio State University Archives) - *Sir George Hubert Wilkins as scientist and consultant to the U.S. miliary: a look at his relatively unknown accomplishments and his papers at the Byrd Polar Research Center.*
11:00 William Schneider (University of Alaska Fairbanks) - *New developments in oral history.*
11:25 David A Hales (University of Alaska Fairbanks) - *The ancestors database in Polarpac3: an overview.*
11:50 Robert Headland (SPRI) - *Archival data and the assessment of polar climatic change.*

12:20 Lunch

14:00 Coach to Scott Polar Research Institute
16:00-17:30 Martin Porter (Cambridge CD Publishing) - *Demonstration of SPRILIB Mark 2*
17:00 Reception in SPRI Museum
18:15 Coach to Girton College

19:00 Dinner

Wednesday 6 July 1994

09:00 Depart for field trip to Greenwich
19:00 Dinner

Thursday 7 July 1994

Session 4: The Russian Arctic: information needs and initiatives

Chairperson: Paul McCarthy (University of Alaska Fairbanks)

08:30 Nina Dobrynina (Research Institute on Nature Conservation and Reserves, Moscow) - *Supply and demand equilibrium: a case of polar information.*
08:55 Valentina M. Markusova (All Russian Institute of Scientific and Technical Information (VINITI), Moscow) - *Information and library support for basic research in the Far East Branch, Russian*

Academy of Sciences.

09:20 Anatoly Vinogradov and Lidia Kabdulova (Kola Science Centre) - *Grey literature as a main source of the information about a modern Russian knowledge on the Arctic region development.*

09:45 Isabella Warren (SPRI) - *The trials and tribulations of acquiring Russian publications today: the experiences of the Scott Polar Research Institute.*

10:15 Coffee

10:35 Business meeting
Chairperson: Nicholas E. Flanders (Institute of Arctic Studies, Dartmouth College)

12:20 Lunch

14:00 Ann Brennan Thomas (WDC-A Glaciology) - *Access to Russian glaciological literature.*

14:25 Jerry Brown (Arctic Connections, Arlington VA) - *Towards a Russian Arctic database.*

14:50 Tamara Lincoln (University of Alaska Fairbanks) - *The Yakut connection: a lost micro-link of Yakut history rediscovered in the Michael Z. Vinoukuroff collection.*

15:15 Valentina Sakharova (Institute of Informatics, Kola Science Centre) - *The importance of being a librarian in a computer world.*

15:40 Tea

16:00-17:30 Poster session

19:00 Banquet at Girton
Circumpolar auction

Friday 8 July 1994

08:20 Depart for British Antarctic Survey

09:00 David J. Drewry (Director, British Antarctic Survey) - *The information needs of polar science.*

Session 5: Polar information initiatives: the role of information technology

Chairperson: Martha Andrews (INSTAAR, University of Colorado)

09:20 Sharon M. West (University of Alaska Fairbanks) - *An analysis of the Polarpac3 database with special emphasis given to collection overlap and uniqueness.*

09:45 Stuart Hibben (Library of Congress) - *Conversion of the Cold Regions Bibliography.*

10:10 Palina Hedinsdottir (Icelandic Museum of Natural History) - *Icelandic research libraries in the natural sciences and the library system Gegnir.*

10:35 Coffee

10:55 Marvin W. Falk (University of Alaska Fairbanks) - *Full-text Arctic databases: the tool, the methodology, the research potential.*

11:20 Ross Goodwin (Arctic Institute of North America) and Robin Minion (Canadian Circumpolar Library) - *Progress towards o Canadian polar information system.*

11:45 C. Eugene West (University of Alaska Fairbanks) - *Building a polar want list using the Internet.*

12:10 Eric Tull (Arctic Institute of North America) - *The polar libraries Gopher: a demonstration.*

12:25 Colin Harris (ICAIR) - *Antarctic information resources on World Wide Web: a demonstration.*

12:40 Lunch

14:00-15:30 Tour of British Antarctic Survey

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