ELECTRONIC INFORMATION and PUBLICATIONS: LOOKING TO THE ELECTRONIC FUTURE, LET'S NOT FORGET THE ARCHIVAL PAST

Proceedings of the 24th Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC)
and the
17th Polar Libraries Colloquy (PLC)

Editors:
James W. Markham, Andrea L. Duda & Martha Andrews

Joint IAMSLIC/PLC Conference held 20-25 September, 1998
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IAMSLIC/PLC 1998 in front of the National Library - University Library building, Reykjavik.

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Pauline Simpson
Co-Conference Convenor IAMSLIC/PLC 1998
IAMSLIC President 1998-1999
National Oceanographic Library
Southampton Oceanography Centre, UK

Electronic Information and Publications: looking to the electronic future, let's not forget the archival past, was the rather long theme title for the joint IAMSLIC/PLC Conference held in Reykjavik, Iceland, 1998.

For the first time IAMSLIC shared the conference with another information organisation, the Polar Libraries Colloquy, who normally hold their conferences every two years. The disciplines within the marine and polar sciences overlap considerably and the theme of the conference was of generic interest to both organisations. The conference ended with both organisations identifying areas where further collaboration could be pursued. We thank the Iceland Organising Committee for hosting a stimulating conference and coping with some 118 participants from all over the World; their thoughts follow this introduction.

The overwhelming availability of electronic information resources has to be addressed by all information managers and the conference covered important topics such as the acquisition and management of electronic publications, and the still unresolved question of electronic copyright. Many of our members have made great strides in building networks, making databases available on the Web and in converting from paper to electronic format to produce many diverse products from CD-ROMs, directories and bibliographies. Both our sciences have a huge historical background and we learnt how to start to build the archives of those earlier scientific investigations and at the same time enjoyed some tales of a few of the more well known pioneers.

The next IAMSLIC Conference will be held in Woods Hole, Massachusetts in October 1999. It will be our 25th Anniversary and we have much to celebrate. The Library and Information community has coped with many dynamic professional changes over these years, and we are still being challenged by new and exciting products and carrier technologies.

The 18th Polar Libraries Colloquy will be held in Winnipeg, Canada June 13-17, 2000. The theme will be "Gateways: Polar Libraries and Archives into the Next Millennium."

For the first time also, this Proceedings is being issued jointly on behalf of IAMSLIC and PLC. Jim Markham and Andrea Duda have again completed the editorship with great patience and professionalism coping with some 47 paper presentations and additional poster sessions; our thanks to both.

INTRODUCTION AND ACKNOWLEDGEMENT

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The 17th Polar Libraries Colloquy and the 24th IAMSLIC conference were held jointly in Reykjavik, Iceland, 20-25 September 1998. This was the first joint conference of these organizations and the first time they held their meetings in Iceland. These two rather small organizations have been aware of each other for some time, and felt given their similar interests and overlap in membership that a joint conference was appropriate.

Informal discussion about having a joint conference sometime in the future started around 1990 among some members of both organizations. A good opportunity arose when it was obvious that both the PLC and the IAMSLIC conferences would be held in Europe in 1998. An offer for the IAMSLIC conference in 1998 came from Iceland at the 1995 conference in Southampton and at the same time discussions on the PLC conference site had been going on for a while. When Greenland withdrew from hosting the 1998 conference, Iceland was the obvious choice. At the PLC conference in Alaska in 1996, a formal offer came from Iceland for a joint IAMSLIC/PLC conference in 1998 and was accepted. At the 1996 IAMSLIC conference in Monterey, this idea was introduced and accepted as well. The hosts in Iceland were the Marine Research Institute and the Icelandic Institute of Natural History.

This first joint conference turned out to be a success with 116 participants from 21 countries, not counting accompanying persons. The meetings went on for four days with a one-day break for an excursion on the Golden Circle that took the participants to historical sites, a hot spring area and some other remarkable places. Other social events included receptions at the Reykjavik City Hall, the U.S. Embassy and the National and University Library, not to mention visits to the Nordic House, the Arni Magnusson Institute, and the library of the Central Bank of Iceland. The conference was held at Hotel Saga, which provided excellent facilities and food. The modern technology for presenting papers never failed, thanks to the technicians of the hotel.

A two-day pre-conference study tour was planned to Akureyri in which 50 people participated. On the first day the participants visited fish processing plants in the fishing village Dalvik and Hrisey, a small island in Eyjafjordur. The second day was spent on campus at the University of Akureyri where a number of talks and presentations of interest to the participants were given as well as an introduction to the newly founded Vilhjalmur Stefansson Arctic Institute.

During the stay in Akureyri the participants were engaged in various social activities, the highlights being a reception in the Icelandic tradition in the wood Kjarnaskogur, with cured shark, dried fish and brennivin and a spectacular show of fireworks by the harbor. The trip to Akureyri was by plane but the group went back to Reykjavik by bus with an expert guide to assure that the trip would be informative and pleasant.

The organizing committee has received many letters of thanks from participants who have expressed their gratitude for the successful conference where they had the opportunity to meet colleagues with another perspective on library work. Most of the participants expressed their interest that another joint conference would be arranged in the future

The organizing committee consisted of Palina Hedinsdottir, Icelandic Institute of Natural History, who led the group, Eirikur Thor Einarsson, Marine Research Institute, who was responsible for information on the Intenet, Gudrun Palsdottir from the Agricultural Research Institute and Steinunn Ingolfsdottir, Hvanneyri Agricultural College. Pauline Simpson from the National Oceanographic Library, Southampton was the program convenor for IAMSLIC and Martha Andrews was a general coordinator between PLC and IAMSLIC. Sigrun Magnusdottir, head librarian, and Astrid Magnusdottir, librarian, University of Akureyri, arranged the pre-conference study tour to Akureyri.

This conference could not have been held without combined effort of many people. The Iceland Tourist Bureau took care of hotel bookings, registrations, bookkeeping and transportation. The steering committee members of both organizations were very helpful during the planning and contributed to the conference in many ways. The many Icelandic and foreign companies which supported the conference are listed below. We want to thank them all for their generous support.

Eirikur, Palina, Gudrun, Steinunn and Sigrun.

We wish to thank the following sponsors:

The Icelandic Library Association,
The Association of Professional Librarians,
The Farmers association
The Ministry of Agriculture,
The Ministry for the Environment,
The Ministry of Fisheries,
The Icelandic Library Bureau,
The Arni Magnusson Institute in Iceland,
The National Library of Iceland,
The Library of the Central Bank of Iceland, The Numismatic Museum,
The Embassy of the United States in Reykjavik
The Nordic house,
VISA Iceland
Sparisjoður Mýrasýslu, Borgarnes

The Marine Research Institute,
The Icelandic Institute of Natural History,
The Polar Libraries Colloquy,
IAMSLIC,
Mál og menning - Internet bookshop and café,
The Haraldur Böðvarsson Fish Processing Plant, Akranes,
Icelandic Freezing Plants Corporation Inc.,
EBSCO Subscription Services,
NHBS - Natural History Book Service,
Iceland Review,
The City of Reykjavik,
IOC - Intergovernmental Oceanographic Commission,
Cambridge Scientific Abstracts,
WLN - Western Library Network (Paul McCarthy),
The University of Akureyri,
The Vilhjálmur Stefansson Institute, Akureyri,
Snæfell Fish Processing Plant,
The Town of Akureyri

IN MEMORY
RUTH GRUNDY

Natalie Wiest
Library Director, Jack K. Williams Library
Texas A&M University at Galveston

Ruth Grundy came to Port Aransas 28 years ago and soon became affiliated with the University of Texas Marine Sciences Institute. Her name appears as the Technical Editor of the *Contributions in Marine Science* as early as volume 16 in 1972 and she was associated with its publication ever since. As the Institute grew and expanded, and the reference collection associated with the *Contributions* grew with it, her role expanded into Librarian as well and she has almost single-handedly developed the UTMSI Library into what it is today.

The 1972 issue of the *Contributions in Marine Science* contains a forward that states "Issues are distributed at a cost of $4.15 per copy (no discounts possible), or on an exchange basis", and "For orders, further information, or exchange agreements, please write to the Librarian, UTMSI at Port Aransas." The price changed as the years went on, but the "exchange agreements" part is what Ruth used to leverage what is now one of the finest and most complete collections of marine science research publications on the Gulf Coast.

Never one to take a narrow view of collecting and exchanging information, Ruth soon found and became a member of a marine science libraries organization that is now best known by its funny-sounding acronym of "IAMSLIC", the International Association of Aquatic and Marine Science Libraries and Information Centers. My personal acquaintance with Ruth dates back to the 1982 meeting in Beaufort, North Carolina. I remember her gracious invitation to attend the next year's conference, which she hosted in Port Aransas. That meeting has been famous in the annals of IAMSLIC, not only for the fine professional exchange of ideas, but also for the after-meeting shopping expedition to Mexico. Ruth always had a keen nose for a bargain and I also remember her from the Honolulu meeting where, in one of the most expensive tourist cities of the world, she found the most beautiful earrings of all, and at a cost of only $3 a pair!

Ruth has always been a "try harder, go farther" kind of person. She was the conference convener for IAMSLIC's 1984 meeting in Woods Hole, Massachusetts. That meeting was the first IAMSLIC meeting for which there were published proceedings and sure enough, Ruth not only convened the meeting, she also edited the proceedings; and the same for next year when she was both President and editor.

I was always interested in Ruth's approaches to librarianship and information handling. Her most memorable presentation to IAMSLIC was in 1987 at Halifax, Nova Scotia. It was entitled "How to build your own standalone system using an IBM AT or compatible and existing software." In 1986 us Aggies in Galveston had just moved into a brand new $5 million library building and were grappling with a new automation system that cost $100,000 and was produced by computing specialists. Ruth proceeded to tell us how she built the computer herself, and manipulated database software that cost a fraction as much, to produce a system that worked well for her library. I was only a few steps beyond locating the on/off switch on my personal computer. Ruth modestly asked me "Do you think I talked over their heads?". She was undaunted by technological challenge and assumed the rest of us were as on top of the technology as she was.

One of the nicest tributes to Ruth's professional capability is what Tommy Adams (now in the Library at UTMSI) and I have heard on separate occasions from different users, professional scientists for the Texas Department of Parks and Wildlife: "She is a legend on the Gulf coast". Scientists would often introduce their new colleagues personally to Ruth, as purveyor par excellence, of marine information and library know-how.

Ruth's husband, Doyle Grundy, was almost as much a fixture of IAMSLIC annual meetings as Ruth. Ruth loathed flying in airplanes, so many times they used their personal vacation time to drive across the country to meetings - Woods Hole, Monterey Bay, Key Biscayne, Bethesda. They shared 42 years together and were parents to four children, and grandparents of six. Ruth's final hours were with her family and many of her friends - no visitor was turned away. Her family sang favorite hymns as Ruth passed into the great beyond. IAMSLIC was in session for its annual meeting at that time, and condolences arrived from across the globe. The conference host, Eirikur Einarsson in Reykjavik, Iceland, sent a message that would be true for many of us, about Ruth and IAMSLIC: "This group of librarians has meant a lot to me, living out here in the middle of the Atlantic Ocean, and I will be forever thankful to her for introducing IAMSLIC to me. She will be missed by all of us."

CONSORTIUM LICENSING OF INTERNET-ACCESSIBLE DATABASES

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CONSORTIUM LICENSING OF INTERNET-ACCESSIBLE LIBRARY DATABASES

A Presentation to the 1998 Joint Conference
IAMSLIC - Polar Libraries Colloquy
by
Steve Watkins
California State University, Monterey Bay

Types of Library Consortia

- Academic/Research libraries
  - CSU/UC/SUNY/Community Colleges
  - Dutch & German university libraries
- Public libraries with community access
- Multiple types of libraries in a shared geographic region
  - GALILEO/PeachNet, JANET

Types of Vendors

- Indexing & abstracting database vendors
  - Silver Platter, Cambridge Scientific Abstracts
- Full-text aggregators
  - Ebsco, IAC, HighWire Press, OCLC
- Publisher-based resources
  - Academic Press, Elsevier, Springer, Oxford University Press
- Combination of the above types is common

Factors to Consider as a Consortium

- Establish a single point of contact
- Legal entity may need to be formed
- Process for deciding priorities
- Authority to act quickly on opportunities
- Variety of internal cost allocation schemes
- Most contracts will require substantial negotiation, often on an annual basis

Advantages to Consortium

- Centralized contract negotiation expertise
- Significant cost savings are possible with broad participation
- Members can afford cooperative resources that are too expensive acting alone
- Potential for reducing redundant collections

Advantages to Vendor

- Single point of contact
- Streamlined accounting & communication
- New revenue stream from smaller institutions may offset reduced pricing
- Broader market presence

Disadvantages to Vendor

- All members may require individual customer support despite single contact
- Maintain complex sets of network IP address restrictions
- May be required to report institutional usage statistics
- Locked into pricing for duration of contract

Disadvantages to Members

- Direct vendor support may not be available
- May not receive institutional use statistics
- Consortium purchasing priorities may not match highest needs of a member
- Pricing models are still in flux
- Full-text coverage changes constantly
- Need to address archival issues

Vendor Pricing Models

- Pool of simultaneous ports or connections
- Per-member pricing vs. single consortium
- Contract may require continuation of print subscriptions
- Number of participating members often affects level of discount offered
- Pricing models still in flux
- Investigate tiered pricing alternatives

Cost Allocation Factors

- Vendor may price access one way, but need to divide costs among members differently
- One possible model:
  - Flat rate for all participants, perhaps 20%
  - Size of user population as predictor of use
  - Factor in actual use as numbers become available, adjusted on an annual basis

Example

4 Members	Flat Fee	Size/Use	Totals
A (100 users)	$500	$400	$900
B (400 users)	$500	$1,600	$2,100
C (500 users)	$500	$2,000	$2,500
D (1000 users)	$500	$4,000	$4,500
2,000 users	$2,000	$8,000	$10,000

Practical Suggestions

- **Collect member network information**
- **Establish single contact at each institution**
- **Be prepared to gather subscription data**
- **Set up fund transfer procedures ahead of time**
- **Contact or Join the International Coalition of Library Consortia (ICOLC), with over 80 participating consortia**

ICOLC Position Paper

"Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information"

- Recognizes all participants in system of scholarly communication & its transition
- Libraries should not bear development costs
- Pricing models must reduce per-use costs
- Purchase vs. license, archival ramifications

ICOLC Statement (continued)

- Encourages flexible packaging by providers to meet diverse consortia
- Reaffirms concept of fair use
- Provides standard guidelines for contract negotiation and content

URL:
http://www.library.yale.edu/consortia/statement.html

For More Information

- International Coalition of Library Consortia
  URL: http://www.library.yale.edu/consortia
- California State University
  URL: http://www.co.calstate.edu/irt/seir/index.html
- Dutch & German university libraries
  URL: http://cwis.kub.nl/~dbi/english/license/

ENVIRONMENTAL FUTURES AND THE STEFÁNSSON LEGACY ADDRESS AT THE POLAR LIBRARIES COLLOQUY AND IAMSLIC PRE-CONFERENCE MEETING IN AKUREYRI, 19TH OF SEPTEMBER 1998

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I would like to use this opportunity to say a couple of words about explorer and anthropologist Vilhjálmur Stefánsson and how his legacy is connected to issues of human-environmental relations and sustainability that are the focus of the new Icelandic Arctic Institute bearing his name.

Stefánsson was often referred to as the prophet of the North. The core of his prophecy was that by learning from people whose ancestors have lived in the Arctic for thousands of years adapting to the environment and accumulating a body of knowledge handed down from on generation to another. The Arctic was not merely a harsh and inhospitable part of the world. The Arctic could thus be perceived as a friendly place, but only if it was approached with an open attitude, unprejudiced and with a willingness to learn from its inhabitants. This means that the full range of the natural resources at hand, the entire ecological niches, had to be exploited in order for people to survive.

Stefánsson's message was controversial and was not met with much understanding from many of his contemporaries who did not sympathise with his role as an advocate for the Eskimo way of life. In fact, most of the Arctic explorers were quite uninterested in the people who lived in the far north and showed little appreciation for their culture. Stefánsson stood out with his progressive attitudes, plea for the end of ethnocentrism and critique of European cultural intrusion which prevailed in the beginning of the century. In his lectures on the Arctic he often used Inuit society as a mirror for his American audience to reflect on their own society. Why were they not happy, in spite of all the material wealth? He claimed to know people who owned almost nothing in terms of material belongings and yet were the happiest humans he knew. He was engaged in such ethnographic cultural critique a long time before Margaret Mead became a celebrity.

I cannot help mentioning that Stefánsson was proud of his Icelandic origin and his identity reflected this. In Iceland Stefánsson's writings received much popularity and today he is still seen, by many, as being an Icelander, no less than Leifur Eiríksson. Nobel prize writer Halldór Kiljan Laxness said in 1927 that Vilhjálmur Stefánsson was gifted with the widest of perspectives of all of his contemporaries and the richest view over the diversity of the human condition.

It is indeed interesting to note how the life and work of Stefánsson himself also link up to the contemporary discourse on the importance of recognising the value of native knowledge. As I said before, the core of his prophecy contained the simple message that the Arctic could indeed be wonderful if those who went there learned from the people who have lived there for a long time and left behind some of their prejudices and ethnocentrism. His conflict with missionaries reflects his views that it was a mistake to force alien and inappropriate values onto cultures and environments where they do not adapt and have little chance of surviving. In many ways Stefánsson's message was amazingly modern and in line with the changes in questions, assumptions, paradigms and practices which seem to be taking place today within the Arctic scientific community. It has, however, not received the attention and recognition it deserves.

In his time Stef did more, perhaps more than any other individual, to change the image of the Arctic, moving it from the periphery of being a bleak frozen waste towards a centre of international significance and attention. Today values are indeed shifting north and times are changing. This is happening rapidly, some would say much too fast, and the Arctic is becoming a focus of social, economic, environmental and political concern.

We can learn a great deal from history about the sustainable adaptation of societies to their environments with methods and social structures that qualify as successful adaptation. We humans use culture to adapt to our environments, to transform raw nature as a biophysical entity into a meaningful environment which we use for appropriation. If there is a mismatch between culture and nature we run into trouble. One example of such a failure is the sad end of Norse life in medieval Greenland where it has been argued that the farmer's culture did not adapt to suit natural conditions and climatic change. This is the conclusion of a recent paper published in the journal Holocene called "Interdisciplinary investigations of the end of the Norse Western Settlement in Greenland", written by Astrid Ogilvie, Jon Haukur Ingimundarson at the Stef Institute and some other members of NABO (North Atlantic Bio-Cultural Organization). According to the paper: "Had the Norse adopted toggling harpoons and other Inuit ice hunting technology, they could have taken ringed seals all year long, and the possibility of crisis in the late winter/early spring might have been avoided." (Barlow *et al.* 1997).

From the paleoenvironmental study of the fate of the Norse Western settlement in Greenland we may also be able to draw some wider conclusions and learn from the insights a specific local problem offers in the understanding of global issues. It also raises questions such as whether western industrial and high-consumption societies are making similar mistakes but this times with much more serious implications and with the viability of humanity at stake.

I believe it is a necessity to learn from the voices of past generations and deliver these lessons to future generations. Our elders can often teach us about de-materialistic values, avoiding the definition of quality of life as limitless consumption of material goods and services, and of quantity being the same as quality of life. They are thus a resource for our children who must adopt less environmentally destructive lifestyles and worldviews than those presently witnessed. In many ways our old people with their roots in the society of farming and fishing represent another culture and era, much like the indigenous cultures today, from which we can also learn a great deal, about sustainable relationships to nature and among people. In both cases we may find common themes of respect for the land and the sea. We also find an understanding of human needs as definite and therefore the possibility that the satisfaction of needs is attainable. In western societies the sky tends to be the limit with the resulting over consumption, over-exploitation of resources and unhappiness, an inevitable result of culturally defining human needs as mainly material and indefinite. The past and contemporary small-scale communities of indigenous peoples can provide us with cultural paradigms which enable us to change our practices and lifestyles, values and worldviews, into patterns that contribute to long term sustainability of human societies. This is what sustainable development is all about and it is especially pertinent for people who live in or are otherwise engaged in the Arctic region to remember that the region may well function as the canary bird of the earth, an early warning system for unsustainable global social and economic processes.

Reference:

Barlow, L.K., Sadler, J.P., Ogilvie, A.E.J., Buckland, P.C., Amorosi, T., Ingimundarson, J.H., Skidmore, P., Dugmore, A.J., & McGovern, T.H. 1997. Interdisciplinary investigations of the end of Norse Western Settlement in Greenland. *The Holocene* 7(4): 489-499.

THE CEASELESS QUEST FOR KNOWLEDGE: STEF AND HIS COLLECTION AT DARTMOUTH

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Rector Gunnarsson, Rector Bessason, Director Einarsson, colleagues. It is indeed an honor to be asked to speak today about Vilhjalmur Stefansson—Stef—and his vital collection, his legacy, at Dartmouth College. I am grateful to Librarian Sigrun Magnusdottir for extending the kind invitation to me. To offer a presentation on Stef and his collection in this venue, in Akureyri, at this University, with the newly-formed Stefansson Arctic Institute nearby, and in sight—across the fjord—from Stef's parents' farmstead, this indeed is a rare privilege. Stef would be pleased.

The American poet Philip Booth, in his poem 'Stefansson Island,' wrote:

> Stefansson: a walrus of a man
> whose walk is paced to sled dogs
> on the offshore ice. (Booth 1966)

This was Stefansson, the giant whose exploratory eye was cast over thousands of square miles of unknown, uncharted Arctic, mapping and defining as he went. The Stefansson who began his relationship with Dartmouth College in 1921 was a scholar whose research and publications would change our understanding of the polar regions. In that year, Stef presented seven copies of his monograph *My Life with the Eskimo* to the Dartmouth Outing Club.[1] (Stefansson 1913) Stef had learned of the outdoor activities of the club, one of the oldest outing clubs in the United States, and wanted to support their aims.

Stef's first visit to the campus occurred in 1929 when he was invited to give a series of four lectures under the auspices of the Guernsey Center Moore Foundation Fund. The first of these lectures was held in 103 Dartmouth Hall, a large classroom and auditorium. As a result of the overflow crowds at the presentation, the subsequent lectures were held

[1] The letter of acknowledgement from the president of the Outing Club can be found in Vilhjalmur Stefansson, Correspondence, 1895-1962, *s. n.,* 1921, Dartmouth. Dartmouth College Library, Special Collections, Stef. Mss. 196. It is interesting to note that the Outing Club president in 1921 was Ellis O. Briggs who joined the U. S. Foreign Service in 1925 and was successively Ambassador to the Dominican Republic, Uruguay, Czechoslovakia, South Korea, Peru, Brazil, and Greece.

in Webster Hall, the largest auditorium on campus. The student newspaper noted that 'He combines as do few others a record of achievement in polar exploration which has made him world-famous, with all the powers of a great public speaker.' (*The Dartmouth* 1929, 1929a, 1929b) He was, of course, both world famous and a powerful orator. Already, the first full-length biography of him had been written. The author was Guthmundur Finnbogason, the Chief Librarian of Iceland, and the monograph was published here in Akureyri (Finnbogason 1927). Many other biographies, appreciations, and critical studies of his work would follow.

It was about this same time that Stef began to amass one of the world's largest and finest polar libraries. The genesis of the collection was a gift of some 300 duplicate polar titles from the library of the American Geographical Society. The director of that organization, Dr. Isaiah Bowman, suggested the disposition of these titles to Stef. Evelyn Stefansson (Nef), in the Stefansson memorial issue of *Polar Notes,* wrote that, 'Unlike most passionate book collectors, it was not possession of the books that Stef wanted, but the information they contained.' She further noted, 'Into the making of his library he put all of his wealth, such as it was, and his most creative thinking'[2] (E. Stefansson 1962). Stef himself made the point most clearly: 'The growth was primarily the result of my habit of making book collecting a by-product of everything I did.' (Stefansson 1964) One rare bookman commented that Stef impoverished himself in the search for books and he mortgaged his home to raise the capital to bid on a copy of Goldson's *Northwest Passage* (1793), a volume still in the collection. He continued by stating that in his twenty-two-day appraisal of the collection, he found numerous titles entirely unknown to bibliographers (Everitt 1951; Goldson 1793). Yet Stef had found them, and found photographs, and manuscripts, and preserved them and made them available to any individual in need of information.

The collection grew quickly and, by 1941, attracted the attention of the United States Navy. On 1 July of that year, R. A. J. English, acting on official orders, paid a visit to Stef in New York City and inspected the collection. A portion of his report to the Hydrographer merits review:

> This office and library occupies three apartments, or about twelve rooms. The library contains several thousand volumes of polar literature, the greater part of which pertains to the

[2] See also Evelyn Stefansson, 'A Short Account of the Stefansson Collection,'*Polar Notes*, 1 (1959): 5-12, for an excellent overview of the development of the collection. See also, Philip N. Cronenwett, 'The Stefansson Collection: Past, Present, Future,' *Proceedings of the Twelfth Northern Librraies Colloquy* 91988): 167-174; and Philip N. Cronenwett, 'Polar Archival Records: A Modest Proposal,' *Proceedings of the Fourteenth Polar Libraries Colloquy* (1992): 195-207.

> Arctic. Many of these volumes are very rare, and probably are not available elsewhere in the United States. The collection was acquired during the last fourteen years and is valued by Dr. Stefansson at $200,000. (Stefansson 1941)

As the collection grew through World War II and as Stef's reputation as the premier American scholar and authority on the Arctic increased, Stef was courted by academic institutions, governmental bodies, and corporations to attempt to lure him into joining with them. Stef was aware of the interest of organizations in his library and his work, but he remained in New York with his library and his scholarly activities continued to be focused on the polar regions.

Stef had continued during and after the war to lecture at Dartmouth on an irregular basis. In 1947, the relationship was made more formal. It was announced in October of that year that Stef was to be Arctic Consultant at the College, where he would provide lectures, courses, and advice to students and faculty. Several weeks later he was on campus to give a series of lectures that would foster awareness of the Arctic and its role, would develop a better understanding of the Arctic, and would provide practical advice and experience (*The Dartmouth* 1947, 1947a). Stef was appointed Arctic Consultant annually for the remainder of his life. He clearly enjoyed Hanover and the College as he and Evelyn decided to move permanently to Hanover and, of equal importance, to deposit the polar collection at Dartmouth in the Library (*The Dartmouth* 1951, 1951a; *Dartmouth Alumni Magazine* 1952).

Less than a year-and-a-half after the collection was placed on deposit, it was acquired for the permanent collections of the College. In part a gift of the Stefanssons and in part a purchase with funds provided by Albert Bradley, Executive Vice President of General Motors Corporation, the collection quickly became a focus of the College's Northern Studies Program. John Dickey, President of the College, stated that:

> "It is the great good fortune of Dartmouth, and, indeed, of the nation that this internationally prized collection on the Far North is now assured of remaining here where it will be readily available to American, Canadian, and other scholars as a part of Dartmouth's projected Northern Frontier Studies Program" (*Dartmouth Alumni Magazine* 1953; Dartmouth College, Office of Information Services 1953).

From its acquisition to the present day, the collection has grown significantly. There are now some 5,000 printed volumes ranging in date from the sixteenth century to the present. Nearly twenty linear meters of vertical files containing pamphlets, clippings, and ephemera complement the printed volumes. Twenty-five thousand photographs, many of which are of the Canadian Arctic Expedition, are available to researchers. Hundreds of maps, many of them extremely rare or unique, provide cartographic support. Finally, there are more that 225 manuscript collections containing records from the eighteenth century to the present. A few representative examples of the range and type of holdings will provide us with a sense of the breadth and depth of the holdings.

Of premier importance are Stef's own papers, consisting of more than 30.5 linear meters of journals, correspondence, diaries, reports, manuscripts of books and essays—both published and unpublished—and ephemera relating to his career as an Arctic explorer and as a student and scholar of the polar regions. There is a published finding aid to the collection so that researchers who are interested in the material can locate items down to the folder level. (Stefansson 1902-1962) The earliest documents in the group relate to Stef's student days at the University of North Dakota, the University of Iowa, and Harvard University. Next are records and documents from the Anglo-American and Stefansson-Anderson Expeditions. Several cartons document the Canadian Arctic Expedition, the five-year odyssey that imprinted Stefansson's name in the annals of polar exploration. The remainder of the collection, the bulk of the holdings, consists of manuscripts, essays, research notes and records, and drafts of manuscripts relating to the many and varied interests Stef manintained. There are, for example, the manuscripts of monographs such as *The Friendly Arctic* (1921), *Iceland* (1939), and the posthumous *Discovery* (1964) as well as of essays from his earliest contributions to the journal *Heimskringla* to the posthumous essay in *The Icelandic Canadian* (1964).[3] Stef's papers are among the richest and most important bodies of polar manuscript material, both published and unpublished, available anywhere.

Of equal historical importance to Stef's papers is the body of his correspondence. From his earliest college years to days before his death, Stef maintained a voluminous correspondence and retained the incoming letters as well as carbons of outgoing letters. The collection, now housed in 109 cartons and extending over 48 linear meters of shelving, contains correspondence for nearly sixty years, and these are sixty of the more important years in the history of polar exploration. From 1895 to 1962, Stef corresponded with many of the major figures in the history of exploration as well as most scholars interested in the field. The collection is eminently accessible, as it has a card index with entries for each individual and institution with whom Stef was in correspondence. An example of the material retained is the partially-printed, partially-holographic postal card from the Landsbókasafn Islands acknowledging the gift of copies of *My Life with the Eskimo* and *The Friendly Arctic* and signed by Jón Jacobson, the Librarian (Stefansson 1922).

[3] The most comprehensive and complete listing of Stef's publications can be found in Robert Mattila, *A Chronological Bibliography of the Published Works of Vilhjalmur Stefansson (1789-1962)* (Hanover: Dartmouth College Libraries, 1978).

A few of the names found in the collection will suffice to give an indication of the breadth and depth of the holdings: Roy Chapman Andrews, Bernt Balchen, Margaret Bourke-White, Richard Evelyn Byrd, Sir Arthur Conan Doyle, Lincoln Ellsworth, Guthmundur Finnbogason, Halldor Hermannsson, Helge Ingstad, Rockwell Kent, Charles Lindbergh, H. L. Mencken, Robert Peary, Knud Rasmusson, Sir George Hubert Wilkins, and Orville Wright. Explorers, inventors, scholars, photographers, authors, and critics; all are represented in the correspondence.
Aside from the correspondence and papers of Stefansson himself, which form the core of the manuscript holdings of the collection, other manuscript collections were acquired by Stef and others still have been acquired in the decades since his death. One example, purchased at auction last year, is a essay by William Innis Pocock, a lieutenant in the Royal Navy, in which the author provides detailed plans, with attending wash drawings, of a series of designs for using trip hammers, saws, and paddle wheels driven by steam to force a ship through pack ice. (Pocock 1828) Pocock, who was aware of the need to have support from influential individuals, dedicated his essay to the Duke of Clarence and Lord High Admiral of England, who would shortly become King William IV. Pocock's proposal was a direct result of Sir William Parry's difficulties in his 1827 attempt to reach the North Pole. His essay, as yet unpublished, was thought to have been lost in the nineteenth century.

The diary of George Rice from 7 July 1881 to 2 August 1883 is an excellent example of the expedition diaries that have been acquired in recent years. (Rice 1881-1883) Rice was a photographer, a member of the Lady Franklin Bay Expedition (1881-1884), who, as the expedition began to founder, took on more and more responsibility and finally assumed a leadership role. The handwriting of the diary begins with a strong, firm hand that details the day-to-day events of the expedition first in broad strokes and then, when the search for food became the focus of every moment of every day, centers on the pathetic attempts to hunt and fish. The last entry in the diary, written in a weak and shaking hand, makes it clear that the author would not survive much beyond that day. He did not.

The small but rich collection of the papers of Robert Peary that are in the Stefansson Collection are particularly important for several reasons. (Peary 1889-1970) The small group of letters in the collection gives evidence of Peary's need for recognition and the difficulty he was having in coping with the conflicting claims to the conquest of the North Pole. Over and over, he maintained that he had reached the pole first and that his nation, and the world, ought to recognize that achievement without argument. A second important portion of the collection is the working draft for his book, *Northward Over the Great Ice.* Finally, there are over 600 working photographs that Peary and his colleagues took and that were used in his publications. What is of particular interest to researchers is the method in which images were selected, cropped, and manipulated—by whiting out and by highlighting with light and dark inks—so that the point that Peary wished to make was reinforced by the illustration accompanying the text. Nearly all the illustrations used or discarded from his monographic publications are represented in the Peary collection.

Looking briefly to the south polar regions, an acquisition made possible by the Friends of the Library in 1991 provides important insight into the Imperial Trans-Antarctic Expedition of 1914-1917. Under the leadership of Sir Ernest Shackleton, the expedition attempted to cross the continent from several starting points. In the diary of Thomas Hans Orde-Lees, the incredible story of bravery and daring is recounted on a daily basis for over a year (Orde-Lees 1915-1916). A typescript continuation of the diary, written after the heroic rescue at Elephant Island of Orde-Lees and his mates by Shackleton, takes the story to the point of the rescue. One of the interesting aspects of this diary is that Orde-Lees marked it up with colored pencils to facilitate use by Sir Ernest when Shackleton was using the diary while writing *South*, his narrative of the expedition. The diary, then, is not only a vital historical document in its own right, but also in important in our understanding of how an expedition leader makes use of materials in the preparation of a publication.

The final collection to be mentioned is a small group of the papers of Ada Blackjack (Blackjack 1922-1973). This particular body of records is very important for several reasons. First, Ada Blackjack was an Inuit, and, at that time, the literacy rate among native peoples of the American north was minimal. The fact that she was able to keep a diary is very unusual. Second, she was the sole survivor of the ill-fated Wrangel Island Expedition in which all other members of the party perished from cold, disease, and starvation. Blackjack's diary, from 14 March to 20 August 1923 is particularly important evidence in a much-disputed attempt to maintain Wrangel Island as a sovereign American outpost in the Russian Arctic seas.

The holdings of the Stefansson Collection, then, provide rich resources for the student and scholar alike. Owning materials, however, is not sufficient. For an institution to acquire and hold manuscript and printed resources and not make them available is not only unfortunate, but unacceptable. To that end, the Stefansson Collection has, in recent years, undertaken several projects to make materials and knowledge of the materials more well-known and more accessible.

In 1981, the collection was awarded a grant by the United States Department of Education, under its Title II-C program, for a project entitled 'Strengthening Polar Resources.'[4] This eighteen-month project provided funding for both preservation of books and manuscripts and much needed intellectual access points. As a part of the program, each monograph and serial was examined and conservation work, if needed, was prescribed. Minor mending such as repair of bindings and the construction of protective enclosures were performed in the conservation shop within the library. More

[4] Grant G00810326. See Cronenwett, 'Stefansson Collection,' for a complete description of the grant and its results.

extensive reconstructions and restoration of leather bindings were sent to private conservators for the needed repairs. As a consequence, all of the printed material within the collection is stable and in useable condition.

A second part of the grant was the reprocessing of the manuscript collections. Each collection was examined, appraised, reprocessed, and rehoused in proper folders and containers. Collections larger than one container had a finding aid prepared for the collection so that researchers would have better access to information. The final aspect of the work was the recataloging of all monographs, serials, and manuscript collections to national standards and in machine-readable format. The resulting records were entered into the OCLC database, the RLIN database of the Research Libraries Group, and in Dartmouth's own online catalog. This latter catalog is now available on the web to provide international access with ease.[5] It was evident from the early days of the project that better access and electronic access to the records would provide researchers from on campus and worldwide a powerful search tool. The rise in use of the collection as the records were entered into the Library's database and into national databases was most evident.

A second major, and more recent, grant was made to the collection by the Gladys Krieble Delmas Foundation of New York City. The foundation, in 1996 and 1997, supported vital work with the Stefansson photographic collections. Several activities were included in the grant. The first was to rehouse fragile photographic materials, including lantern slides, glass plate negatives, and photographic prints and negatives, that had survived for more than seventy-five years. Stabilization of prints, negatives, and lantern slides was also an important focus of the project. The third section of the project was organization of and access to the remarkable photographic collections that Stef had gathered and, in some cases, had taken himself. One exciting part of the project was the identification of a list of photographs taken by Sir George Hubert Wilkins, a member of the Canadian Arctic Expedition, in his own handwriting. As a result, we were able to match the descriptive list with the images and, as the list contained very precise dates when photographs were taken, a sequence of images was made possible. This information was added to the database created to provide access to the images.

One important by-product of the project was the development of a controlled vocabulary, an authority file, to describe Arctic images. We were, thus, able to better describe and more uniformly describe these photographs. This vocabulary or thesaurus is available to any researcher or polar library interested in obtaining a copy. We would be pleased to provide either a print copy or one in electronic form.

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[5] The URL for the Library is <http://www.dartmouth.edu/~library>. Aside from access to the catalog, the Web site provides a wealth of information regarding the Library and its services.

In the future, we hope to continue work with the Stefansson Collection photographs by scanning in the images from the Canadian Arctic Expedition and matching image to description. By mounting this combination on the World Wide Web, we will be able to provide international access to this important resource. A second future project is the recreation of a series of photographic albums electronically. The albums are on highly acidic paper with notes on the images written in white on black paper. While it is possible to preserve the text and the images separately, we hope to recreate digitally the entire album leaf by leaf so that the researcher has access not only to the text and image, but also the relative placement of the images. A final proposed project is to stabilize, print, and catalog the images in the collections within the Stefansson Collection that have not yet received such treatment.

A grant-funded project that will be completed within the month is, again a Delmas Foundation project. In this instance, the foundation provided the Research Libraries Group, an international consortium of 159 research libraries from five continents, with initial funding to convert finding aids for manuscript collections into electronic format using Standard Generalized Markup Language and the Encoded Archival Description format, a standard accepted throughout the United States. As a portion of Dartmouth's project, a number of the finding aids for collections within the Stefansson Collection will be converted and mounted on both the Library's web site and in a national database of finding aids that will be developed and maintained by the Research Libraries Group. One exciting aspect of this project for Dartmouth is that we will have a direct link from the cataloging record of the collection to the electronic version of the finding aid. We believe that this will provide students and scholars with much more refined information regarding our holdings and will, thus, improve the quality of our public service.

A series of endowed funds support the acquisition, preservation, and processing of materials within the Stefansson Collection. The earliest established fund was created by Mr. and Mrs. Peter B. Dirlam in 1965 to acquire materials for the collection and to support publications emanating from the collection. After Stef's death in 1962, a number of individuals provided memorial funds to honor him and his work. These funds were pooled in 1967, along with income derived from royalties and the sale of duplicate books, to establish the Stefansson Memorial Fund that is specifically intended to be used to purchase books, manuscripts, and photographs for the collection. A third fund, given in honor of the polar explorer and pioneer polar aviator Lincoln Ellsworth, has been established by the Lincoln Ellsworth Foundation of New York City. The foundation generously presented a gift in 1994 with additional gifts in the three succeeding years. The four foundation gifts, now in an endowment honoring Commander Ellsworth, provide resources for acquisition, processing, preservation, and cataloging of polar materials. A fourth fund was established in the recent fiscal year. The Edward Tuck 1950 Family Fund #2 was established to provide support for the collection. We are very grateful to all of the donors for their most generous support.

In 1959, Dartmouth honored Stef—in his 80th year— with the degree of Doctor of Letters. The text of the citation notes that 'the Stefansson Collection at Dartmouth serves all who would venture with knowledge in person or in thought to the far north or the farthest south' (*The Dartmouth* 1959). James Calvert, commander of the USS Skate, the submarine that surfaced at the North Pole based on Stef's proposal, wrote that Stef's creed was 'the ceaseless quest for knowledge . . .' (Calvert 1962).

That quest was both intellectual and physical. Stef was a scholar and a collector, who in the great tradition of his Icelandic forebears like Arne Magnusson of three centuries ago, collected a scholarly library, a rare book library, and a body of manuscripts that preserved the history of polar exploration.[6] And like his Icelandic Viking forebears, Stef was an explorer who, at great risk, ventured through and over the ice to seek new lands and carry that knowledge back.

Closing, as in opening, with poetry, listen to Egil Skallagrimson's description of sailing through ice, as Stef would do, nearly a millenium later:

> Thél høggr stórt fyr stáli
> stafnkvigs á veg jafnan
> út meth éla meitli
> andærr jotunn vandar,
> en svalbúinn selju
> sverfr eirar vanr theiri
> Gestils olpt meth
> gandr of stál fyr brandi (Nordal 1933-1945).

We at Dartmouth look forward to a long and mutually beneficial relationship with the Stefansson Arctic Institute and the University of Akureyri.

Thank you.

[6] The most accessible study of the great Icelandic manuscript collector and scholar is Hans Bekker-Nielsen and Ole Widding, *Arne Magnusson, The Manuscript Collector*, tr. by Robert W. Mattila (Odense: Odense University Press, 1972).

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ELECTRONIC JOURNALS

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ABSTRACT: The electronic journals are emerging on the internet. There are great expectations regarding the electronic journals but there are also barriers. The librarians have to take on a new tasks brought about by the electronic journals in the library. Implementing the full text electronic journal in the library requires the librarian to deal with selection, acquisition, licenses, and organizing in a very different way from what was required for the printed journal. Marketing and teaching the end-user is an important issue.

KEYWORDS: Electronic Journals, Libraries

The scholarly journal started in the 17th century. The scholarly community needed to communicate and publish research as quickly as possible. Journals represented a new way of thinking, the search for a new knowledge and the exchange of information. The quest for knowledge and new ideas did not end. The journals grew in numbers and caused what is known as the information explosion. Soon the publishers took over the task of publishing. Organizing the information became important and the librarians took over tasks such as indexing the journals, searching for the information as well as providing the end-user with the articles by interlibrary loans. After the journals grew in numbers the vendors played an important role in distributing the journals to make sure the journals would reach the reader. The printed journal has been published for three hundred and thirty three years. The writers, publishers, vendors, librarians and the reader have played an important roll in the success of the printed journal. The electronic journal is an opportunity to present information in a new and interesting way. There are great expectations regarding the electronic journal but there are also barriers.
In my talk I will focus on the librarian and the electronic journal and the new tasks it has brought about in the library.

Why should the librarians provide full text electronic journals in the library?

First of all it is what our user wants. To keep our leadership role in the information world we have to supply them. If we do not do it our users will turn to other resources.

Timeliness/currency of information

The length of time between submission of the paper and its final appearance in a printed journal is a major concern for authors and publishers. It often takes from six months up to two years for the writer to have his work published from the time the article is submitted for publication. We can add to the publication date one week up to three months until the journal reaches the reader depending on how it is delivered - by ship or by air. By providing access to the electronic full text our users can access the journal much sooner after publication.

Accessibility and availability

Electronic journals are always available both day and night and not only when the library is open. They do not get lost and there is not a pile of journals in the library to be re-shelved. The most recent issues can be read at home or at work and the user does not need to enter the library.

Support for distance education

For libraries that provide material to support distance education, can help the students by providing electronic access to journal resources.

Searchability

Full text journals provide the capability for searching text beyond the traditional bibliography database access points. The full text of journals are searchable but it depends on what format has been used for the text. It is important to know the difference between the formats to know what kind of searching can bee done.

Most electronic journals are published in printed format and later made available by electronic means in two different formats that look similar, but are very different. The two different formats are the image format such as PDF *Portable Document Format* and ASCII format American Standard for Information Interchange. Only a few journals are published in electronic format directly on the Internet which is called electronic publishing.

Most journals are in image formats such as PDF. It is an exact replica of an article. The image is not searchable and links are hand-created and cannot be updated or changed when the publication changes, except by re-creation of the links. Image files are print-oriented and often do not display well on-screen. The image format requires a separate viewer to be installed into the browser such as Adobe Acrobat or Real Page.
The other format is ASCII and it is the standard data transmission code for the representation of character via computer. It can be manipulated in any way that a computer program can manipulate data. SGML is an ISO standard for the creation of ASCII. SGML is a publishing standard, intended to use for publishing process, but publishers are taking some time to convert from their current electronic typesetting processes to SGML. PDF format is a favorite for publishers, as it is possible to define different security levels for a PDF file. Changing of the document can be denied, printing can be denied, etc. For material to be read on screen the HTML format (hypertext markup

language) is used. HTML is the subset of SGML and is used for displaying documents in Web browsers. Articles in SGML or HTML are searchable and links can be embedded.

It is very difficult to translate from one format to another; therefore if the publishers use HTML format on the Internet and the printed text is in PDF format all the text has to be retyped. The format used has to be decided from the beginning.

Major issues and Barriers

The major issues and barriers in providing full text electronic journals in our libraries are:

Cost

The journal subscriptions cost, for the printed journal, has been very high in libraries in recent years and subscription prices have gone up steadily. At the same time library budgets have been reduced. Many libraries have canceled important subscriptions. Librarians expected the subscription cost to go down with the electronic journal, but it is not likely that it will happen.

Publishers have offered subscribers to the paper version access to the electronic version at no extra charge for a trial period. Now for most journals that trial period is over and the prices the libraries are paying are higher than before. Most publishers are selling a joint subscription for the printed and the electronic version and this joint subscription price is 10% higher than for the printed journal subscription. Librarians would like to have the choice of subscribing to the electronic journal only and pay less, e.g., 80% of what they pay now for the printed version. This price is based on a calculation that states that the electronic journal is 20% less in production cost than the printed journal. The cost for journal subscriptions at the libraries is already too high and many libraries have difficulties subscribing to all the journals they subscribe to. If the electronic version will be more expensive it is difficult to justify a subscription to the electronic version of the journal if that version does not offer a better product than the printed one.

Copyright

Today it is the publisher who owns the article, not the writer and not the institution who paid the writer for his work. It is prestigious for the writer to get his article published in a respected journal. The writer is eager to get his work published so when the publisher gives him an agreement to sign where he gives away the copyright to the publisher he does so without any thoughts. Very few writers know it is enough to agree only on a site license for the printed text. When we talk about free access to articles on the net it is usually the copyright fee that stands in the way. Copyright fees that are paid to the publisher. If the author did not give away the copyright to the publisher he could have rights over the use of the article in forms other than printed. Issues, such as fair use are in the hands of the publishers. Information about fair use can bee found on the home page of the publishers. Many publishers have not yet made distinction between print and electronic form regarding fair use. The only thing which is universal about copyright, from the publisher's standpoint, is that fair use is virtually always interpreted as applying strictly within the institution, and any distribution of copies such as interlibrary loan outside of the institution is prohibited.

Archiving

Access to older journals is important. Until now, libraries have shouldered the responsibility to preserve and make older journals accessible, often providing expensive housing and facilities. Librarians have invented a network of libraries to share the journal collection of each library so readers in different countries can access the journals. Publishers have not taken any responsibility to preserve the older journals. Is this role going to change now with electronic journals? Are publishers or vendors going to store the electronic version of the journals on their computers and make them accessible in the future or are libraries going to carry on the responsibility of archiving the journals?

Many librarians have pointed out that publishers should store both new and older journals on their computers. But it will create problems. If the archiving is in the hands of the publishers the journal collection has to be accessed from many different publishers creating a lot of work for the librarian in linking to the journals in many different locations. The publisher might go out of business or merge with other companies. What if the library cancels its subscription, can the library still access the older part of the subscription that the library used to subscribe to? The publishers are not eager to store older journals and are happy to leave that task to the libraries.
Vendors have offered storage of older journals and publishers and vendors have been looking into this issue together.

It is most likely that the libraries are going to shoulder this responsibility as with the printed journals.

If libraries are going to do this in each library the computer storage for the journals is very expensive. The libraries have to join forces and share computing resources for this purpose. This is a very important issue and it would be worth the effort to look into how many libraries could share a joint server for this purpose. Could it be done nationwide or for the whole of Scandinavia, for example? If libraries in Scandinavia could store these journals on one server and share the cost it would be possible for libraries with limited budgets to make use of this service. The server would provide access to large electronic collections and each library would have no local storage burden. If all the articles are stored this way in the future, tasks like inter-library loans and photocopying would no longer be needed except for older journals published before the electronic journal era providing the copyright issue and the ownership rights are solved.

Implementing the full text electronic journal in the library

Libraries and library staff have recognized the need to respond to the changing environment electronic publication creates. Many tasks performed by the serial librarian require evaluation and redefinition. To ensure that he can meet these new challenges retraining is important.

Selection

It is a different selection process than with printed journals. How are we going to select electronically published journals for the library? When selecting printed journals we have relied on, among other things, quality control provided by publishers and authors.

The publication time is comprised of two main elements: the peer review process and the production process. The period from the time the author sends the article to the publisher until the article enters the production process is used for quality control. The publisher asks a specialist within the same field as the author to review the article. Many publishers use closed peer review. When this is the case the name of the author is not made known to the reviewer and the name of the reviewer is not known to the author. In this way the reviewer is protected and the writer's work is judged fairly. Only 10% of articles sent in for publication are published without any alteration. Most articles are sent back to the author and he/she is asked to make changes or the article is not accepted. Sometimes an article is not accepted because a similar work has just been published. In this way, the publisher is not only controlling the quality of the work but also the number of articles being published. It is the publisher who selects what is made available to the reader, acting as the primary information gatekeeper. When selecting a journal that has been published directly on the net by the authors can we trust the quality? Has the article been reviewed? How do we keep up with the changes made on the article? It is easy for the author to change the text directly on the net.

When selecting the electronic journal for the library the journals are sometimes made available only with a group of journals not just the journal you needed for the library collection, so instead of selecting one journal at one given time the librarian has to select a group of journals.

Acquisitions

Regarding acquisitions, special attention must be given to a different method of acquisitions and determine what will be best for the serials budget. These are: purchase or lease; stand-alone; university libraries; or consortium; working relationship with your current serials vendor.

Licenses

Assessing and negotiating licenses is a difficult and new task for the serial librarian. They have to take a new look at the key issues of copyright and ownership of an electronic text. Ownership rights have to be negotiated with the publishers. Most publishers have a ready-made agreement for the librarian to sign but it is very important that the librarian read the agreement and ask for changes in the agreement if needed.

Marketing

Marketing is also an important task in the library.
If electronic journals fail to reach the readers they will not survive. A recent study shows that electronic journals are not widely used.

Teaching the end-user

Motivating our users is very important. Libraries are identified as key agents in the provision of training in the use of electronic resources. The aim is to increase the number of users who are comfortable with new technologies and assist them in coping with current electronic developments. Readers have to access and accept the electronic journals and the technology needed to do so. Computer literacy is not widespread, even in the United States. On-line running costs are often high and many do not have the equipment necessary nor the finances needed to buy computers. So it is important that the libraries are well equipped to provide facilities for users who do not own computers. Some users can not get used to subject searching and if that is the case we have to be flexible in our methods of teaching. Some users will always use text searches.
Until now the readers have been scholars in the same field who have the knowledge to read the work but with the e-journal the article reaches not only the scholars but also the lay person who might misunderstand the content. The librarian can teach the user how to select and learn to judge what is a reliable source of information.

Access and organizing

There are different access models in use today, some in libraries, others with subscription agents and publishers. The provision of access can be provided for in thee ways:

- Remote access to vendor or publisher;
- Local access to the library server;
- Remote access to a library or consortia.

Many publishers are now publishing their journals both in print and electronic versions. A reliable access to the electronic journal is very important and many publishers have launched homepages on the Internet where their electronic journals are accessible to the subscriber. What publishers are doing today is to give access to newly published electronic journals but so far they are not providing access to articles on a chosen subject both in new and older journals.

Many publishers are working on different projects such as IDEAL and LINK to make the electronic version of their printed journals accessible to their readers.
The subscription agents are also creating electronic warehouses that offer search possibilities and document delivery in addition to traditional services. The tendency is now that publishers and vendors are working together on different access models.

Libraries that mount the journals locally have to use a server that is often run by the library. Usually only part of the collection is stored locally such as a collection from database providers like OVID.

Remote access to an-other library or consortia is a solution many are considering today.

<u>Finding the full text</u>

The libraries and the publishers use alphabetical or subject list of journals for better access.

It is difficult for the reader to access journals from many different publishers. To make this easier the library has created one site where its users can access all the journals the library subscribes to. Libraries use their homepage on the Internet to make this possible. The library produces a list of all the journals and makes a link to the full text of the journal. This list is often both an alphabetical list and a subject list. Subscription agents such as Ebsco or Swets are beginning to provide this kind of service to the libraries. It is a great task to create all the links to the many different journals that the library subscribes to and to maintain the links if the URL *(Uniform Resource Locator)* changes for the journal. The libraries that subscribe through these subscription agents can ask for a file including their journal subscriptions to place on their homepage with a link to the full text of the journal.

To find a full text articles on a selected subject the best way is to do a literature search through databases and after that link to the full text. The database providers such as OVID or Silver Platter have provided a very user-friendly software interface. Users can do advanced searches and then select how much text they want to read: the title, abstract, contents of the journal or the full text article; and from the references of the full text they find links to articles on related subjects.

The links to full text of e-journals is also done through local online catalogues (OPACs). In order to make it work the library systems have to be searchable over the World Wide Web - something that many library systems do today. The user searches for the journal according to subject or title and when an entry is found a link is made to the full text of the journal.

Some journals like NEJM have started classifying articles according to subjects. It is an interesting project and users can easily access full text articles on subjects such as breast cancer. It might be easier for the user to access subjects in this way and in the future a link could be made to other full text journals on the same subject.
The problem of passwords has to be solved to improve access. Libraries who assign passwords to their library users know how time consuming this is. To use different passwords to access different full text e-journals is impossible for the user. Instead of passwords, publishers have found an easier way that might solve part of the problems. They use the name of the library server as an ID for the library users. An institution

should need only one password for all users to access all subscriptions. The use would be restricted to the IP address of the subscribing institution. Outside access can only be done with a password, so in most cases it has to be a combination of an IP address and passwords to provide access to users both within and outside the library.

Librarians from the 17th century worked in libraries where there were only books and manuscripts, books with a body of knowledge that had not changed much over the centuries. At that time a doctor could read in his lifetime all that had been written in medicine. Then journals emerged with a body of knowledge that kept changing all the time as knowledge increased. Not only did journals become outdated over a short period of time but they were also published in parts and grew in number so it was hard to find a space for them in the library. These librarians had to face changes that were not easy to solve at that time. Changes are always hard. There are too many questions and not enough answers yet. The electronic journal is a part of the very exciting electronic world of information. It is best to join in and enjoy the journey into the future and hope the answer will be waiting for us in the 21st century.

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A JOURNEY TO THE CENTER OF THE SCHOLARLY COMMUNICATIONS UNIVERSE

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ABSTRACT: Every universe has its own ecology, a set of relationships among the inhabitants of a given environment. The landscape of scholarly communications is no different; we have a variety of actors including researchers, librarians, publishers, and mediators who have established relationships. For the most part, these relationships have been mutually satisfactory in the era of print distribution. The advent of the era of electronic distribution has been both heralded and decried. However, taken in the context of these already well-established relationships, vendors perceive this era of electronic distribution as a catalyst and an opportunity, not a death sentence. We have developed both aggregated and gateway services. We can add value to our original functions by providing more information about information. We can streamline the library's function of selection and access, and we can focus the publisher's function of delivering information. In many ways, the era of electronic distribution does not demand that we change our roles, but rather that we change our business models, standards and relationships. But this is only the beginning of a new era, and there may be more opportunities and surprises as we revise these models.

KEYWORDS: Periodicals vendors; Acquisition of serial publications; Electronic journals; Serials subscription agencies; Scholarly publishing

Every universe has its own ecosystem, a set of relationships among the inhabitants of a given community and with their environment. Each inhabitant of the community stands at the center of one of many different circles that constitute the varied relationships of the ecosystem. For the most part, the relationships among the inhabitants of the scholarly communications universe have been mutually satisfactory in the era of print distribution. There are certainly some significant areas of conflict, but there are no outright predatory relationships. The advent of the era of electronic distribution has been both heralded and decried. Electronic distribution of information has given us the possibility of reaching a wider audience with deeper information access, and it has given us the agitation of machines that don't operate as expected, the need for skills that are not part of our original professional toolbox, and legal solicitude without sufficient background.

However, taken in the context of our already well-established relationships, many of us perceive this era of electronic distribution as a catalyst and an opportunity, not a death sentence. In many ways, the era of electronic distribution does not demand that we change our roles, but rather that we change our business models, standards and relationships. But this is only the beginning of a new era, and there may be more opportunities and surprises as we revise these models.

The landscape of scholarly communications has a variety of actors including researchers, publishers, librarians, and intermediaries who have established relationships that sustain the scholarly communications universe. Our researchers reside at the center of one circle; they have interactions with both librarians and publishers. Librarians help them find and evaluate information while publishers help them produce and distribute their own research more broadly. Publishers are the focal point of a sphere that gathers in potential research, mediates the evaluation of that research, and delivers it back outward again to libraries, to intermediaries and to scholars. Librarians are the nucleus of an orbit that evaluates and selects among the publisher offerings using a variety of intermediaries to help sort, organize and provide scalable access to these selections and helps match the end user together with the resource. The intermediaries in this universe serve many different functions and all have their own circles: we have abstracting and indexing services; we have bibliographic networks and utilities; we have integrated library system suppliers, and we have serial subscription agencies.

I represent an organization that provides serial subscription and management information services, and like other inhabitants of the scholarly communications universe, we have our own circle of relationships for which we are the center. Traditionally, the role of the serials vendor with respect to library and publishing clients is three-fold. First, vendors gather information. We have a great deal of information about our publisher clients. We know who publishes specific journals. We know how much these journals cost. We know whom to contact if a problem arises with a subscription. We also have information about our library clients. We know where to send journals and we know where to send the bills for the journals.

Second, vendors provide information about information. In other words, we give context to information by organizing it in relation to other information. For example, to help our publishing clients, we know how many subscriptions our library clients have to any particular journal, and we have a history of those subscriptions. For our library clients, we know how many journals are ordered, from which funds, and for how long. And like all good librarians, we know how to find out what we don't already know.

Information is good, and information in context is better. However, what is even better than information and context is the ability to do something with these organized data. All of this information about information supports our third purpose or function. This third major function with regard to both our library and publishing clients is the delivery of services that makes serials management scalable. For our library clients, we have developed systems and services that allow them to order titles, direct those titles to the appropriate library branch or person or fund, and claim issues of any journal for a variety of reasons. For our publishing clients, we have developed systems to gather in updated information about titles already in our database and new information about titles to be added to our database, and to deliver out billing and shipping information. In support of all of these services, we also interact with another group of intermediaries. For example, subscription agents collaborate with integrated library system vendors to find ways to arrange the information we have about a particular library client's holdings in a format that can be transferred and imported into the client's OPAC.

In the old era of print distribution, subscription agents, publishing clients, library clients and all supporting intermediaries knew our roles with all that these roles entailed. We knew what information was available, what information was needed, in what format, and for what purposes. In addition, we all had systems or access to systems that allowed us to use this information to get our respective jobs done. From the center of the vendor's circle, we could gather in information from publishers, and they knew exactly what information they needed to give us. We could also deliver back the precise set of data our publishing clients needed from us. From the center of the vendor's circle we could also deliver outward all the information library clients needed to make decisions related to serials management, and library clients knew what information they needed to share with us. We also had very well defined guidelines for dealing with intermediaries. We knew what our fellow intermediaries, the abstracting and indexing services, the integrated library systems providers, and the like, aimed to do and where we shared common interests.

Beyond understanding the ecology of this universe and our respective places in it, we were also careful to avoid overlapping or conflicting activities. Libraries didn't really publish journals; publishers didn't really manage subscriptions on a large scale, and abstracting services didn't really deliver journals. Within the discipline of ecology, interspecies interaction can be categorized in one of four ways. Mutualism implies a symbiotic relationship in which both species in the community benefit from their interaction. Amensalism implies an indirect mechanism or behavior that disallows or limits interspecies interaction. Commensualism refers to a relationship that allows both species to coexist next to each other. Competition and predation is defined as a relationship in which one or both species actively attack the other (Milne and Milne, 1971). In the old scholarly communications universe, there was no long term interspecies competition and predation. Without competition, an ecological community in a fixed environment can remain fairly stable and consistent. The good news is that this stability allows us to develop standards and to set expectations for all of our roles. The bad news is that it limits our ability to become more complex and sophisticated and more diverse.

But that was all in the past. The present is an era of electronic distribution, and this new method of delivering information has changed our environment, destabilizing our ecology. Specifically, what has changed is our ability to distribute more broadly and more quickly the same information that was formerly represented in printed journals. We can also distribute audio, video and software application files in combination with text and graphics. In addition, current technology allows us to index more deeply than was previously possible. And this secondary source indexing can now be seamlessly linked to the primary source material. Both the primary and secondary source materials can be seamlessly linked to the databases of subscription agents and the catalogs of libraries. And all of this can be delivered to the end user desktop by means of what has become very commonplace and standard software that is freely available to everyone with an Internet connection.

From an ecological perspective, a new environmental resource has been given to all of us, and this is cause for serious consideration. In fact, one reason that this is problematic is that the new technology is theoretically available to and useful to each of the inhabitants of our universe. Libraries could become publishers; publishers could manage subscriptions, and vendors could collect and organize materials for delivery to end-users. However, I believe that before we can tackle new possibilities, we need to regain our old stability in this newly configured environment. This stability is essential to our existence and our evolution. In his poem, "The Second Coming," W. B. Yeats wrote, "Things fall apart; the center cannot hold; Mere anarchy is loosed upon the world" (Yeats 1924). Early in this era of electronic distribution, subscription agents were excluded from the process. As an example, e-journal programs at professional library conferences almost never included a vendor representative. The reality is that without the subscription agent as intermediary, publishers and librarians alone could not achieve a parallel scalable solution for delivering electronic journals to libraries and their end-users. If we, the inhabitants of the scholarly communications universe, do not remember our circles, our places in this universe, our centers will not hold!

From my perspective as a serials subscription agent, there are some crucial tasks that must be accomplished in the present. Subscription agents must choose to be format-blind in the delivery of information and services. By this I mean that we must include in our circle of tasks, and in the information we gather, all manner of serials regardless of how they are delivered to the subscribing client. Within my organization, colleagues frequently remind each other of this mantra: "We don't answer the phone by saying, "Blackwell's Information Services for print subscriptions only."

Presently, we do include some information in our databases about electronic versions of print journals and about independently published electronic journals. And we are working to gather more of this kind of information. To do this, our first order of business was to define what constitutes an e-journal. For Blackwell's, three components are necessary to define something as an e-journal that should be entered into our database. First, the material must be full featured. By full featured, we mean that the e-journal must include complete text and graphics. If the material is an electronic iteration of a printed journal, it must replicate the entire original printed journal with the possible exception of advertising. Using this definition, we have already eliminated web-based materials that include only partial contents, or table of contents, with or without abstracts, or journal marketing sites. The second element of Blackwell's definition is that the journal must have some kind of continuous service. This is not meant to address the question of archiving electronic materials but rather to eliminate those titles which only have access to the current issue and only for a brief period of time. Finally, the title must have some subscription prerequisite that needs to be managed. This element effectively eliminates those titles that are freely available to anyone who happens upon them without subscription, registration or payment of any kind.

Our second order of business is to understand what kinds of data we will need for the management of e-journals and what kinds of data are available. Information in this category includes such questions as these: How is this title related to a title with the same name published in a different medium? What is the subscription requirement for this title? Is it free for print subscribers? Are there additional charges for the electronic version? Are there separate charges if there is no print subscription? What are the restrictions on which users and how many users may access the title? Is there a license and what does the license permit and restrict? And where can I retrieve or view this title? All of the information that results from these questions must be codified and stored in databases that we've redesigned to accommodate this new medium. The end result will be a business system that includes all bibliographic and product details that will allow our library clients to identify a title, relate it to the same material in another medium, order the title, license it, and create an access mechanism of their choice. Just as librarians have worked at finding ways and places to define the salient points about e-journals in their MARC records, so have vendors had to make these changes and others to our database structure and content.

A third element of our electronic information initiative is training. In the same way that publishers must educate their staff to understand what kinds of new products they are distributing, and in the same way that librarians must learn how to locate, select, and access these new products, subscription agents must teach our staff what is involved in facilitating the ordering of these same products. To do this, we must train our internal staff to understand what e-journals are, to be conversant on the various pricing options, to locate, understand and be prepared to answer questions about the license, to gather the appropriate access information such subscription identification number, IP addresses, or userid and password, and finally, to deliver the precise location information that will allow our clients to create access from the library collection. In order for all of us to communicate effectively, we all need to understand the terminology, the options, the possibilities and the additional components of this new form of distribution.

These tasks are all within the circle of the subscription agent, things that we can and do control ourselves. The next step is getting the actual information in from publishing clients, and this is less in our control. Initially, we found that publishers had bypassed us in delivering information about e-journals and had gone directly to librarians. In some cases, they even bypassed librarians also and went directly to end-users. For the most part, this is far less common than it used to be, but there are still many occasions when a publisher forgets long-standing and time-tested relationships that have served us all so well. More often, information is not problematic. What is difficult to get publishers to understand is that all pieces of the access process are better executed if they include the subscription agent.

This information collection alone brings us a bit of stability, but still, there are unresolved issues. One of these unresolved issues is the lack of consistent pricing models. Currently, publishers are producing e-journals that are freely available with a print subscription, or separately priced, or priced as a combined package, or priced in a tiered package based on number of sites or number of users. In the era of print distribution, we had a partially parallel situation with pricing based on individual subscriptions and institutional subscriptions and pricing based on geographic elements. The difference between these two situations is that there were agreed upon standards in the print distribution era. There were limited choices and all members of the scholarly communications universe understood these choices. In this electronic distribution era, we have too many choices; these choices are applied inconsistently and change frequently. Publishers must come to a collective understanding of their revenue streams and the resulting pricing models. We cannot continue to handle each individual publisher's offerings on a case by case basis.

A second problem area that breeds instability is the matter of licensing. Many electronic journals have associated licensing agreements or terms and conditions. However, it is not unusual to find that a publisher has no licensing agreement in place. This alone is significant information to have. Proving the absence of a licensing agreement may take longer than proving its existence. Finding the license agreement in our current environment is also a very labor-intensive activity. And once found, the task is to identify the appropriate people who can read, understand and sign on behalf of the agreeing parties. Because this licensing agreement is an important piece of the process of bringing e-journals into a library collection, subscription agents must have a place in this operation. Yet here again, we have so many different methods of completing the licensing process and no standards. Two years ago, I tracked the licensing process for a client ordering approximately twenty e-journals from seven different publishers. The range of attitudes ran the gamut from one publisher assuming that the subscription agent would be responsible for all licensing related issues including enforcement to one publisher who refused to allow subscription agents to even see the license. As a community, we are slowly making progress in terms of identifying key elements of licenses as the ALA Principles for Licensing Electronic Resources have done and in terms of moving towards more standardized licenses as the UK National Electronic Site License Initiative has done. We need to continue to make progress towards greater licensing availability and more standardization. This is very clearly an area where collaborative development is necessary.

Archival access to electronically distributed journals is another issue that jeopardizes our communal stability. In the era of print distribution, library subscriptions resulted in the purchase of an actual physical entity that could be owned. In the era of electronic distribution, some publishers claim that money paid as part of the subscription and licensing agreement entitles the subscriber to access services, but not property ownership. There is a very subtle question here. Has this agreement entitled a subscriber to the service of accessing journals electronically, or has this agreement entitled a subscriber to the content available through the service? If the agreement pertains to the content itself, then it seems fair and reasonable that a subscriber should have access for eternity to the content delivered during the subscription period. And yet there are very few arrangements that have been put in place for this type of perpetual care. In a profession where the archival record is held in such high esteem, where access to our scholarly history is paramount, it is untenable to allow this issue to go unresolved. Although this is not a new issue, it is certainly the least attended of all the obstacles to our regaining stability.

The last issue I'd like to highlight is access. In the print distribution era, we put all of our journals on shelves in a building. We create bibliographic records that describe the journal and locate it within the collection. In the electronic distribution era, information about an e-journal could be available in several different places. Its actual location is not relevant, but the information about its location is extremely relevant. What we have in the current environment are two different models for organizing this kind of access information. We have the aggregated collection model that delivers to a subscribing library a predetermined group of titles. The most common example of this type of access is the collective titles of an individual publisher. This model may seem convenient from the publisher's perspective, but it is less functional from the perspective of the librarian or the end-user. Librarians don't deliver someone else's collection to their end-users, and end-users don't access journals by going to individual publisher silos. Often, the aggregated collection is the result of a deal that just can't be refused (Holleman 1998), but in the end, it is a disservice to librarians whose responsibilities include the meticulous selection of material appropriate to a specific group of end-users. More often what we see now is a gateway collection that pulls together specifically selected titles from a variety of sources and displays an access link from that one place. This gateway model actually comes closer to providing a true library collection. It is important to define where this gateway location exists. Is it the library OPAC or the library web site or a vendor-supplied gateway? Librarians must pay careful attention to this decision and implement their final choice where end-users will gravitate to gather information.

I am occasionally asked where we are going in the future. My silent response is usually that I hope we can just get through the present first. We need to regain our stable ecology. In so many aspects of the contemporary world, technology has given us incredible opportunities that entice us. But technology alone is not enough; it must be integrated into all aspects of our professional life. We need to agree on our roles, define our terms, build a sustainable business model and develop the appropriate standards. Each group in our ecological niche must focus some energy on learning, understanding and training outwards within our individual organizations. We need to pursue a pricing model and licensing terms that can be made standard, or at the very least, the most commonly occurring model. We must establish guidelines for archiving, and then we must build this archival access. And we must create the most expedient and appropriate mechanism for delivering all of this to our end-users.

But then, once we have caught up with the present technology, when we can pass electronic information around our circles and within our circles in a scalable way, we can certainly think about the future. The future is not about the electronic distribution of static information; it is about the collaborative development of, and access to dynamically generated information. The future will allow us to build a net space that is community focused. The Internet is a very crowded place with much to offer all of us and quite a bit that is not relevant to each of us in our professional lives. Our goal for the future should be to build focused communities within a much larger world. Just as our physical library collections are tailored to the needs of a specific group of end-users, so too must our electronic library collections be tailored.

The current thinking about what the future will look like begins with portals. A portal is a virtual gateway of sorts; it has been called an on-ramp or a place that users pass through on their way to other sites (Louderback 1998). Yahoo! Is a good example of a generic portal. The reason I suggested earlier that librarians must pay special attention to where you build their gateways is because your gateway will evolve into a virtual portal. It will be the on-ramp for your end-users, a starting place. A well-established and nurtured portal can then evolve into what current thinking calls a hub. Hubs will hold a more central position for your user community (Berst 1998). Surrounding your hub will be access not just to static electronic information and in depth, subject-specific indexing, but also collaborative workspace, data modeling tools, and autonomous intelligent agents that will allow community users to stay current and to do involved research. In the same manner that technology is not the crucial issue in our present era of electronic distribution, this will also be true in the future. Work is already in progress to redesign the generic chat room model and to share software applications among disparate users. Development of autonomous intelligent agents is ongoing. The issue for the world's scholarly communities is how we will build a scalable model to deliver and use these services. How will librarians justify to their larger organizations the cost of delivering these services? How will publishers define a revenue stream that will allow them to continue to produce the quality content at the core of our services? And how will intermediaries find a scalable way to broker both content and services for publishers and libraries alike?

Think, if you will, of a net space where marine scientists congregate to retrieve published information, research distinctively relevant topics, discuss this information with other marine scientists, interactively use data produced by others, keep abreast of current trends and developments, and collaboratively produce more research. This is a hub. This is your future, if only we can get through the present.

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INNOVATION, IT ISSUES AND INDIGESTION: BUILDING A NEW ELECTRONIC PRODUCT FOR TODAY'S LIBRARIES

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ABSTRACT: Elsevier Science has been working with the library community to develop products and services that fulfill the needs for delivery of information to the desktop. The Marine Science community will be particularly well served by provision of these services through Gateways such as Oceanline.

Finding out about the requirements for such a service was the easy part. Groups such as IAMSLIC were forthcoming about their concerns and willing to share experiences and grievances. The Scientific community have participated in focus groups and research, and helped us to refine our product concepts.

Putting theory into practice is where the real challenge starts. We have developed tools and processes which are undergoing constant revision. We have fought with copyright and authentication issues. Staff have had to be retrained and roscoelite and whole new departments have been formed. We are not over the hill yet, but despite headaches, heartache and heartburn, we are now ready to face the new millennium with the new face of publishing.

In this presentation, the various issues are dealt with, and a brief overview of IT systems is given. Lastly, a prototype of our new service "Oceanline" is presented.

FROM PAPER TO ELECTRONIC

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ABSTRACT: In the past five years we have moved from paper volumes of a number of Abstracting subscriptions to CD-ROM and now On-line Web Editions. We are implementing a unified search engine for all subscribed web databases (OCLC's SiteSearch, USM web version, identified as MdUSA) and will compare use as individual book marked sites vs. unified search site usage. I intend showing: 1) What being an active member of a larger consortium (The University System of Maryland) has cost and relating the cost to benefits and services derived. 2) The price variations, use statistics and an evaluation of use, potential and benefits or loss.

Introduction

The USM Libraries purchased OCLC's SiteSearch software in January 1998. SiteSearch is a Z39.50 compliant web interface developed by OCLC that allows users to search multiple databases using a unified search interface and search strategies. It also provides an authorization capacity. An electronic resource committee (USMERC) was established to implement SiteSearch. We named the USM SiteSearch product MdUSA. MdUSA is a multiple play on words to reflect the wide extension of service throughout the State as well as including that it is a Maryland University System Access project.

Implementation

While the implementation plan was getting underway by the USMERC committee Betty Day, Manager of Electronic Information Services at College Park and Chair of the Committee, was working on a list of databases that multiple campuses desired. The goal was improved negotiated consortial pricing.

We started with version three of SiteSearch and in July we migrated to version four nearly three months after the original implementation date of April. As with most computerization projects I have encountered, the implementation time is significantly longer than proposed.

We have experienced some disappointment in implementation. It seems there are varied interpretations and implementations of Z39.50 standards even to the point that some vendors still do not even plan implementation. Our ITD staff has had to do a great deal of work implementing access to some of our databases. It is disappointing that even a few of the databases purchased through OCLC are not compliant. We all have some databases that require direct connections which subvert our goal of unified searching.

For the future

As of September 15, 1998, we did not have statistics to do any use comparison. Our first month of summary information (September) has not given very detailed information for decision making. The Columns of information in this first report were: Database names, # of Query, # of Hits, # Fetch and Scan, without campus designations and search histories. We now know that implementation of a project of this magnitude is still a mammoth undertaking but anticipate that the arduous task will provide many benefits in use statistics and ease of access to a wider audience of patrons.

MEASURING SCARCE RESOURCE UTILIZATION

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ABSTRACT: Each year, the demands upon library budgets expand. This is particularly true within the acquisitions area where the cost of periodicals continues to increase as the number of periodicals continues to increase. Historically, these increasing demands were resolved by substantial efforts commonly known by such scholarly terms as "Periodical Use Studies" or "Journal Cancellation Projects." The result was the temporary reduction of materials costs that ultimately was absorbed by additional price increases. The development of bibliographic and full text databases in the past several years was originally viewed as a low (or lower) cost alternative to escalating print prices. We now see our electronic expenditures absorbing an increasing portion of our acquisitions budgets. What was originally thought to be a panacea is now exacerbating our budget battle.

To compensate for this redirection of funds, we must change our approach to analyzing these costs. This paper will attempt to present a methodology for quantifying the effective utilization of our scarce acquisition dollars while maintaining or improving our levels of service. The qualitative analysis will necessarily remain in the hands of the librarians.

RESEARCH DEVELOPMENT: COLLABORATION AND FUNDING RESOURCES

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ABSTRACT: World Wide Web technology has facilitated a new era of shared information. The mission of Community of Science (COS) is to provide rapid, easy-to-use information about scientists and the funding of science, arguably the most important and least understood engine of progress in the world.

The COS Expertise database currently contains roughly 65,000 common-format, first-person profiles of researchers and scholars in North America, making it the most complete database of its kind. This resource is the product of a consortium of over 220 leading research universities, government agencies, and other R&D organizations.

COS Funding Opportunities is the world's leading online resource to identify funding information related to research, collaborative activities, travel, curriculum development, conferences, fellowships, and post-doctoral positions. Sources of this information are federal and regional governments, foundations, professional societies, associations, and corporations.

COPYRIGHT : WILL IT STRANGLE INFORMATION ?

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ABSTRACT: The free-flow of information depends on the permission to use copyrighted works. Most countries in the world have copyright laws which allow for limited copying of journal articles or chapters in books for the "public good". Libraries and information centres have depended on those laws to provide a high level of service to their users. Copyright holders - principally but not exclusively commercial publishers - are concerned that the extension of even limited copying privileges into electronic publications will damage their interests, owing to the ease with which an electronic copy can be made. Technological progress has been the friend of libraries in many ways, but in respect of copyright adherence technological developments are creating problems. New copyright legislation is being introduced at both international and national levels to control electronic copying. Very often "innocent" library copying is caught up in legislation to prevent large-scale piracy of audio-visual works. The WIPO Treaties in 1996 resulted in a compromise between public and commercial interests, and to varying degrees the application of this compromise in national legislation has either been threatening or encouraging to libraries. Within Europe two Directives are proving particularly significant. the Database Directive and the draft Copyright Directive. While the United Kingdom Government has been reasonably sympathetic to the interests of libraries in its reaction to these Directives, the same cannot be said of all EU countries, nor of the attitude of the EU Commission. Within the US the struggle to protect the interests of libraries in new legislation is still continuing and there is still a big question-mark over the future of "fair use".

In addition to legislation, copyright issues in electronic publications are being resolved through two other routes: licensing and industry-wide agreements. Licensing appeared at first to be against the interests of libraries but it may prove more of an ally to libraries than legislation in the long-term. Industry-wide agreements were difficult to reach in the US in the CONFU discussions but look more hopeful in the UK in the form of agreements between JISC (the Joint Information Systems Committee) and the Publishers' Association. These agreements will, however, only benefit academic libraries initially. International

pressure from librarians, such as through ICOLC or EBLIDA, will be essential if reasonable copying privileges are to be defended. Whichever way the copyright issues are resolved in each country, it is vital that librarians speak out in the interests of access to information for their users.

I feel like beginning this paper with the slogan : "librarians of the world unite!" The kind of library service we have grown up with is under threat. Some people see the threat to traditional library services from the development of electronic information services which by-pass libraries. The argument runs that electronic sources of information will be so easily available to users that the traditional role of librarians as information intermediaries will not be necessary. It is not my role in presenting this paper to argue that point one way or the other, but there is another way in which libraries are threatened by the electronic revolution, and that is in the area of payment or non-payment for library services. Will people continue to use the services of libraries if libraries are forced to charge? That question has a political question bound up with it, which again I am going to duck today. It is my brief to look at the impact of copyright legislation upon library services, and part of that impact could be that libraries have to charge users for certain services, whatever the political attitude towards charging in principle. If we are forced to make large payments to publishers for viewing on screen or for single copies of documents, we shall have to pass those charges on to users. Therefore the answer to the charging question will have a major effect upon library services and will shape the kind of library service the next generation will receive. Many generations of library users have not had to pay to look at a document, nor to make a single copy for their personal use. If that situation changes with new copyright legislation applied to electronic publications, libraries as we know them will cease to exist. I am sorry if that sounds dramatic, and that is a worst-case scenario, but there are some legislators in some countries who are thinking that way after intense lobbying by commercial interests. What is at stake is not a romantic view of the kind of library service people have enjoyed in the past but a trend towards payment for all information which could jeopardise the future of democracy. The open kind of society most countries in the world enjoy depends on the free flow of information, and copyright legislation which restricts the free flow of information has implications which go wider than the maintenance of good library services. Copyright legislation could strangle the free flow of information. We must all take new copyright legislation seriously.

We must not give the impression that we are against the drafting of new legislation to cover electronic publications. The copyright legislation in most countries was drafted in the context of publication on paper, and it must be modernised. Even if, as librarians hope, we carry the principles of paper copyright forward into electronic legislation, there are examples of electronic situations which need specific mention in new legislation. For example there is the question of shrink-wrapped licences, a question which did not apply to paper publications. Librarians know *how* they want the question of shrink-wrapped licences to be covered. My point is that it is no use taking the line that we are happy with paper copyright legislation and will stick with that when there are issues like shrink-wrapped licences that have to be addressed. To some extent the detail of electronic copyright legislation will be decided by the courts, through case-law, but the courts themselves need good legislation upon which to base their judgements. Also, whether we like it or not, there are powerful forces advocating new copyright legislation. Some of those powerful forces neither know nor care about libraries. At both an international and national level, new copyright legislation is being requested by the film and television industry, who fear piracy of their products. Very often in looking at new copyright legislation you find that library copying has been caught up in the same net as video copying. We know that they are very different but to a legislator they sometimes look the same. There are also powerful forces who *do* know about libraries, such as international publishing conglomerates. Whichever country you come from, please do not underestimate the lobbying power of the commercial organisations who have the ear of government officials. These are the people pressing for new copyright legislation and they do not often have the interests of libraries at heart.

I can understand the concern of commercial publishers about electronic copying. If I were a publisher I would be very frightened by the ease with which electronic copies can be made. Publishers have been concerned about the effect of photocopying upon their revenues, but that is nothing by comparison with the possible effect of illegal copying of electronic publications. By and large technological advance has been a good friend to librarians, and our services are vastly improved by the availability of networks. But technological advance will *not* be the friend of librarians if it causes legitimate library copying to be caught up in the wish to prevent illegal electronic copying. We have to find a way of distinguishing the two. What was worrying in the early stages of discussion about copyright in electronic publications was that legislators showed no interest in separating legitimate library copying from piracy. Many of them have now modified their attitude but it is still an issue in some countries. And we also have to convince publishers that we are against piracy. In arguing for fair use copying, we are not arguing for legislation which is so liberal that the sale of works in copyright is harmed. But publishers have to understand that we are not going to pay any more to do a reasonable amount of copying when we are already paying exorbitant sums for subscriptions.

I am not sure how far this audience has been following international developments in copyright legislation, so forgive me if I cover ground that is familiar to you, but the story begins with the World Intellectual Property Organization, WIPO, which rightly perceived the need to modernise the Berne Convention. In theory a world-wide look at copyright in electronic copyright could have been in the interests of librarians, as increasingly we work in an international context and consistency in copyright laws across the world would be very beneficial to us. The trouble is that WIPO is not the body to handle the concerns of librarians in a sympathetic way. WIPO is a diplomatic body, each country represented by government officials. It also looks at the big picture, and I suspect that the concerns of librarians looked very trivial by comparison with issues of international trade. For that is how WIPO looked at copyright in electronic publications, as a trade issue not as a public good issue. WIPO is also concerned with "property", that is ownership, whereas librarians are concerned with use. It is not surprising therefore that the WIPO Treaties agreed in December 1996 are not drafted as librarians would wish them to be drafted. Indeed it is all credit to those library organizations which were able to lobby WIPO - and there are even rules on who can lobby - that they were able to influence the text of the Treaties to the extent that they did. The library lobby found surprising allies in the telecommunications companies, who are generally in favour of liberal communication. So the WIPO Treaties did not favour the needs of libraries but did not hinder those needs as much as they might have done. WIPO is a permanent agency of the United Nations and therefore its work continues. It would be a mistake for librarians to think that WIPO will not make other decisions which will affect library services, and I know that the IFLA Copyright Office is monitoring the ongoing WIPO work.

WIPO Treaties have to be adopted or rejected by national legislative bodies, and this provides scope for national amendments to what has been agreed internationally. In Europe there has not been a great deal of debate about the adoption of the 1996 WIPO Treaties because the issues have been caught up in concern about Directives from the European Commission - about which I shall say more in a moment - but in the United States the adoption of the WIPO Treaties has provided the focus for a major debate on the future of fair use in library copying. There are US librarians here who will know more about that debate than I do, but in summary let me say that the future of fair use copying is still at risk, although effective lobbying of Congress by ARL and other library organizations has secured some protection for libraries in the new legislation. The basic problem in the US as elsewhere in the world is that legislators treat copyright as a trade and commerce issue rather than an educational issue. In the US it is the Department of Commerce which is handling the issue, in the UK it is the Department of Trade and Industry. In order to be effective librarians have had to motivate educational organizations outside government to lobby on behalf of users, because by-and-large the educational organizations *within* government have not understood the educational implications of more restrictive copyright legislation.

This is certainly true of the attitude of the European Commission towards copyright. There have been two important Directives, the Database Directive which has already been approved and adopted by most European countries, and the Copyright Directive which is part way along the long and winding road to approval by the European Parliament. The feelings of many people in the UK about the European Commission are either disapproval or else ignorance. It comes as quite a shock to many British people to realise the extent to which our national legislation is being affected by European legislation, and the copyright area is a good example of that. We are having to wake up to what the bureaucrats in Brussels are proposing, and what they are proposing in the copyright area is not good news for libraries. The early proposals from the European Commission would have allowed publishers to charge for a library user to view a document on a screen and copying would have been very restricted. UK librarians are also having to learn to lobby, an activity which has not come naturally to us. Fortunately for the UK, librarians in other countries in Europe are less ignorant than we are about the activities of the European Commission and more active in lobbying on behalf of libraries. EBLIDA, the European Bureau of Library, Information and Documentation Associations, has become very important to us as the voice of libraries in the corridors of power in Brussels. Thanks to EBLIDA we are beginning to influence the wording of the EU Copyright Directive and it may be that when it is finalised it will be acceptable to libraries. Even if it is not, we do have a second chance to protect the copying done by library users, and that is at the stage the EU Directives are adopted by national parliaments. As with the WIPO Treaties, national parliaments can introduce exceptions for libraries, although the European Commission tries to prevent this in the interests of what is called "harmonisation". Lobbying by librarians was effective in stopping the worst effects of the EU Database Directive in many European countries, and we shall probably have to rely upon the same process when the EU Copyright Directive is considered by national parliaments. In the UK the present Government is more sympathetic to the concerns of librarians than its predecessor was and is supporting many of our efforts to change the EU Copyright Directive before it is finalised. The issues are too important for us to be complacent, however.

In addition to international or national legislation, there are two other ways in which issues of copyright in electronic publications are being resolved. One is through contract law, that is through the terms of licence agreements, and the second is through agreement between publishers and librarians on general standards. I am calling this last route "industry-wide agreements", which is a misnomer in the sense that such agreements may not involve all publishers or all librarians, but nevertheless they involve enough publishers and librarians for us to be confident that they represent a consensus view. Into this category I would put the agreements in the UK between the Publishers Association and the Joint Information Systems Committee (JISC) and the CONFU discussions in the United States. But let me first cover the question of licensing.

Two years ago the licensing of electronic publications appeared to librarians as a threat, and we were inclined to rely more upon legislation to protect our interests. So much progress has been made on the terms of licences, however, that licensing appears more as an advantage. This is partly because of the uncertainty I have already described about the nature of copyright legislation, and partly because publishers have been willing to change many of the clauses in early electronic licences that librarians found unacceptable. Even the very difficult question of electronic inter-library loan is becoming easier to define in licences for electronic publications. I do not wish to be complacent about this issue, because there are still barriers in licences, such as the barrier to international inter-library loan, which have to be overcome, but the progress made in a relatively short time on the wording of licences does encourage us to continue the negotiation and hope that soon we shall have model licences which incorporate many of the points for which librarians have been pressing.

The good progress that has been made on the wording of electronic licences is due in no small part to the face-to-face meetings that have taken place between publishers and librarians, meetings at which we have been able to explain why we think certain points are very important to our communities. Understanding the other point of view has revealed more common ground than was at first thought. Talking to UK publishers about the question of inter-library loan, for example, it was clear that their knowledge of what actually happens by way of inter-library loan did not correspond with the reality on the ground, and they realised that it was much less harmful to their interests than they had imagined. Likewise, librarians have learned about the publishers' fear of electronic piracy, which is a very understandable fear. In the UK these face-to-face discussions have taken place in the context of several working parties set up by the Publishers Association and the Joint Information Systems Committee, which is the agency channeling government funds into higher education electronic information developments. The most successful of these working parties has been the Fair Dealing Working Party, which has produced guidelines for fair dealing copying in the electronic environment, fair dealing being the UK equivalent of fair use. Another working party has been drafting a model licence for electronic publications, and although its first approach did not prove acceptable to librarians - perhaps because it met too early - its most recent drafts do reflect the progress that has been made on licensing terms in general. We are very hopeful that by next year we shall have a model licence which any UK university could safely accept. The most recent PA/JISC working party has been on the subject of electronic inter-library loan, and even on that difficult subject we are making good progress. The use of electronic delivery seems acceptable to publishers when the electronic copy received is used to print one paper copy and then destroyed. Such use would not have been acceptable to publishers a few months ago. And even on the more difficult question of the retention of an electronic copy by the end-user we are making progress. Sally Morris, the publisher who co-chairs the working party with me, has produced a proposal for an alternative system of supply which would give the publishers some income from what is at present inter-library loan traffic but at a cost no more than UK libraries pay for inter-library loan. So with some imaginative thinking we believe that agreement between publishers and librarians is possible without either side making any impossible sacrifices.

One reason why the PA/JISC discussions have been so successful is that we have met under what are called "Chatham House rules", that is we have met as well-informed individuals rather than as delegates of our communities and we have worked in a very informal way. We have tried to find solutions by looking at practical examples of what we want to achieve and by working around problems. The CONFU discussions in the United States have made some progress but I believe that they have stalled when they have become very formal, with entrenched positions. I do not know how such publisher/librarian discussions have been conducted in other countries, but I would urge that you follow the British example in this respect, and have informal discussions which allow for solutions without sacrificing any principles. It is true that our approach results in agreements which do not have the force of law, but in practice, as they have the backing of the Publishers Association and the higher education funding bodies, they will be respected and could be used as a defence if any university were to be taken to court by a publisher. Such industry-wide agreements are not a complete substitute for legislation or for licensing, but they provide a framework within which more formal solutions to copyright problems can be addressed. The UK Government, for example, is aware of the PA/JISC agreements, likes those agreements and will I am sure ensure that any future UK copyright legislation is in line with those agreements.

To summarise, the current intense activity in copyright matters is very important for the future of libraries and for the future of the kind of open society which libraries help to sustain. We cannot ignore what is happening at both a national and international level. The revisions to international copyright law are worrying but their worst effects can be neutered at a national level, provided - and this is a huge proviso - that librarians are successful in lobbying national governments and legislators. In many countries the situation is still very precarious and I would urge everybody here to take some action to protect the interests of your users by lobbying for fair use copying and other long-standing library facilities. Licensing is beginning to help us, as are changing attitudes in publisher/librarian discussion, but copyright is so important that no librarian can leave it to somebody else. We must all get involved, or we may find that access to information is strangled by restrictive copyright arrangements promoted by commercial interests.

THEN THE WHOLE MOUNTAIN LEAPT DOWN...

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Introduction

The title words describe a phenomenon in geomorphology, which in Icelandic has literally been called a mountain leap or a rock leap (berghlaup), in German Bergsturz and in English rockslide (Olafur Jonsson 1976). When this happens, there is a drastic and permanent change in the landscape. Old and familiar features vanish and new ones come into being.

In spite of ongoing automation in libraries and information centres for around three decades the library landscape has, until now, remained unchanged. Traditional work in libraries: collection development, technical services, patron services and cooperation, are to a large extent the same. Orders have been placed with agents or publishers. Something substantial has been received, be it books, journals or disks of some sort, something we can hold in our hands, place in our libraries and in most cases use in the traditional way.

Now there are, however, indications that dramatic changes in the dissemination of information are about to take place, changing not only the landscape of library and information science, but also where the power to control knowledge, in a knowledge based society, resides, threatening thereby democracy* itself.

In this paper an outline is given of traditional collection development, developments in publishing and its influence on access to knowledge and on where the power in society resides, new features appearing in the library and information world and a historical perspective of the importance and control of information.

*In the context of this paper democracy is used in a twofold sense, that of : ***a government*** *by the people; that form of government in which the sovereign power resides in the people as a whole, and is exercised either directly by them or by officers elected by them and in the sense of* ***a political, social or economic equality*** *: the absence or disavowal of hereditary or arbitrary class distinction or privileges* (Webster's Third New International Dictionary 1963; The Oxford English Dictionary 1989).

Collection development

It used to be the role of librarians to build gigantic collections of written information where recorded knowledge of mankind was preserved, for the use of the present and posterity. In large research libraries the immediate usefulness of an item was of no consequence. Of importance was the accumulation of all the material needed to build a complete collection on a given subject, regardless of whether individual items would be used close to the time of acquisition or a century later. These collections were maintained for the use of scholars when needed. Now collection development is less and less about building collections and more and more about acquiring access to material, which in some cases has uncertain durability.

Developments in publishing and access

Modern publishing is considered to have begun in the eighteenth century. At that time and also in the nineteenth century many of the publishing houses still active today were founded. The common people of those times read to acquire knowledge. It was the time when circulating libraries were established and the great encyclopaedias, such as the *Encyclopaedia Britannica* were founded. Both can be thought of as "universities" of the poor people or those unable to attend school and get a formal education. They had tremendous educational influence. At the beginning of the twentieth century some very large and influential publishing houses were established (Dessauer 1989). Even so the publishing industry, in the United States for example, was a minor one, economically, until the Second World War (Dessauer 1989).

Since the middle of this century tremendous changes have taken place in the publishing industry: in ownership, publishing policies and in the media of publications. Previously publishing houses were often owned by families, **interested** in publishing and distributing certain kinds of information, knowledge or literature.

When publishing scientific and scholarly material became more profitable around the middle of the twentieth century, many of the old publishing houses which had been at the forefront of publishing over a century were bought by large conglomerates with the effect that towards the close of the eighties most of them had vanished or lost their autonomy, (Dessauer 1989) although publications are still issued in their names.

Since then, more and more publishing houses have been bought by gigantic conglomerates, some of which own many publishing houses and are all set to buy more should the opportunity arise. Even though associations and institutions issue a sizeable amount of the publishing, a large amount of scientific and scholarly publishing is issued "for-profit-only". In the landscape of dissemination of scientific information **this is a rockslide.**

Changes in ownership brought national and international supercorporations into publishing, which brought economic pressures to get maximum profit, resulting in changes in publishing and distribution policies. Emphasis was put on publishing and distribution of so called "big books" which would sell a large amount of copies at the cost of titles less likely to make big sales (Dessauer 1989). The "small" titles do not get the same distribution and advertisements as the ones likely to sell well in the first place. Authors have been stressed about this and have in some cases themselves promoted the sales of their books (Dessauer 1989).

This development means that on the whole fewer thoughts and ideas are being promoted. As a consequence our intellectual life will keep growing poorer, over time, instead of growing richer as one would expect during the information age in the knowledge-based societies. In democratic societies, everyone, not only the authors, should be concerned about dissatisfactory distribution of published knowledge and cultural material.

The publishers have decided what gets published and how it is distributed and promoted. With the advent of computerized publishing, publishers and distributors also decide who gets to buy or have access to what, and in addition they pose new restrictions on how the publications can be used after they have sold them. They even decide who of the traditional library users get to use what they sell to the libraries. The distributors define the user groups of the libraries, not the libraries themselves or those running the libraries. In the library landscape **this is a rockslide.**

Except for old print on paper material, interlibrary loans will soon be a thing of the past and so will consortia and cooperative collection development. These were devised to maximize the choices of library patrons by giving them access to the holdings of more than one library. In the future more and more of the material will be available directly through the Internet in the publishers' or distributors' databases. From there information will be sold directly to users in small units. Until now the unit of sale has been no smaller than a journal article, for example. In the future it is likely that the unit of sale will be a certain part of a journal article, for example, a graph, a table, some other illustration or part of text, identified by the DOI numbers (DOI 1998). In the **library landscape** and in the landscape of dissemination of scientific information, **this is a rockslide.**

Because there are limitations to the geographic distribution of those having access to subscriptions of computerized material, a university or a company in more than one location has to buy as many subscriptions to access as there are locations. The smallest unit of access is one concurrent user meaning, in many cases, around 50 people. In many cases this means that individual users and whole countries, like Iceland, will have to do without access to high priced electronic material, when there are not enough users to justify buying access for even one concurrent user. **In the library landscape this is a rockslide.**

Individuals can freely lend each other publications in the paper format, but it is, in some cases, illegal to lend another person ones password to a publication in the computerized format. Staff working at outposts or in remote departments does not have access unless it is paid especially. Publications in the paper format, however, can circulate freely within the organization. Printed publications in older editions can be passed to the outposts, whereas disks with electronically published material have, in many cases, had to be returned to the publisher upon the issue of the next edition.

Due to these restrictions there is in some cases, contrary to expectations, less access to the information when it is in computerized format than there was to information in the print on paper format. In a knowledge-based society this means that an end is put to economic and social equality, when only those with money can buy access to the basis of success: knowledge itself.

Residence of power

Even though the restrictions of use are posed in the name of economic viability, it is clear that publishers and distributors do by this take power to limit the distribution of published knowledge, power which they should not hold in democratic societies, especially as such power can be used for other purposes than assuring economic viability.

Given the fact that the discovery of the knowledge distributed with these conditions has, in many cases at least partly, been financed by the public, e.g, results of research carried out at publicly funded universities and research projects financed by public funds, limitations of use and absorbent costs cannot be tolerated. Publishers and distributors in this way limit reasonable use and reasonable distribution of published information and knowledge.

Research, at least in some subject fields is, to an ever larger extent, financed and even carried out, by private companies, for example pharmaceutical companies. This not only means that they have the power to sell publications of the results dearly, it also means that they have the power to suppress findings which will harm them financially.

Domination of private companies over the access to published material and newly discovered knowledge equals a shift in power from democratically elected delegates and the citizens to the owners of the publishing and distributing companies and the sponsors of research, which in some cases may be the same party. If these developments are not stopped the results could become catastrophic.

New features in the library and information landscape

In the landscape of library and information science some examples of rockslides, destroying familiar old scenarios, have been demonstrated. There should also be some new features in the library and information landscape. And there are. Subscription services, database hosts, publishers of computerized material and document supply centres are combining access to their services in such a way that after locating desired items by searching bibliographic databases the user can, at the touch of a key, automatically get fulltext access to the desired items, provided that he or his library subscribes to the access or order it online from a publisher or document supply centre (SilverPlatter Information SilverLinker 1998; SilverPlatter Information Press release Swets Subscription 1998; SilverPlatter Information Springer Verlag 1998; SilverPlatter Information Press release SilverLinker TM 1998; SilverPlatter Information. British Library Document Supply 1998).

Less than a year ago the user would have had to first do a search in a bibliographic database, then find the desired item in the library, and order it from the publisher or on interlibrary loan.

Importance of knowledge and information : a historical perspective

At this point it is healthy to look back at some examples from the past. The importance of knowledge and information is not a new discovery. Nor is it a new discovery that to have **absolute power**, a ruler has to be able to **control** access to **information absolutely** and to obliterate information as needed for his rule. The very existence of organized societies depends on information. Evidence remains of collections of information, serving the same purpose as modern day records centres, archives and libraries, which have been discovered and dated since before the existence of writing systems (Peterson 1988). From the very beginning of organized societies recording, organization, conservation and the control of right of access to information has been of importance to rulers.

The founder of the Chinese empire, Quin, who ruled around 220 BC, on the recommendation of his Grand Councillor Li Si, had books burned in order **to "*make the people ignorant*"** and to prevent criticism of his rule based on knowledge of the past. The only books to be spared were those on medicine, agriculture and divination. This measure also served the purpose of making knowledge an imperial monopoly. Those who wished to study were to take the officials as their teachers. When this measure did not suffice to keep criticism of his rule at bay, Quin conducted a purge of scholars (Cottrell 1995). His empire lasted over two thousand years.

The reverse is also true, namely, that giving the public political power, means giving them access to knowledge and information and it means organizing the access in such a way that the required knowledge and information **can** be found with ease and speed and used when required.

In Western societies ownership of and access to information has changed with the passing of time. Most of the time access to information and knowledge was limited to members of the ruling classes.

In the wake of the French Revolution, 1789-1799, came a turning point in public access to primary information and published knowledge. During the French revolution records were considered to be a basis for the establishment of a new society, the same way as they had been the basis for maintaining the old one. Records of the old society were maintained probably for cultural and historical reasons. Records of the new society were preserved for the protection of public rights. The first national archives to be established was the French Archives Nationales, established in 1790 in Paris.

In the French Revolution access to records was recognized as being important to society. To secure that access:

- an independent, national, archival administration was established;
- responsibility of the state for the care of the valuable documents of the past was recognized
- the principle of public access to archives was proclaimed. The decree of the 25th of June 1794, has been considered an archival bill of rights, for it proclaimed the right of the public to access public records (Schellenberg 1956).

The public also gained access to published knowledge. A lot of books and whole libraries such as libraries of the émigrés and libraries of the church were confiscated. Thus some 8,000,000 books became national property. The most valuable of them went to the French Royal Library, which was duly renamed La Bibliotheque Nationale. The French National Library was open to the public for four hours every day before the end of the eighteenth century. Interest of the authorities in the library remained and it continued to grow through legal deposits, gifts, legacies, and government appropriations (Gates 1968; Thompson 1977).

As we all know, accumulation of library material is of no use without proper organization and cataloging. In the heat of the aftermath of the revolution, time was taken to compile the first national code of cataloging rules. In 1791 custodians of the books received these rules on how to catalog them. They were made for a card catalog, which was a rare catalog form at the time.

A copy of the catalog of books in each district was kept there and a copy sent to Paris where it formed a part of the national union catalog. Around three million publications were cataloged. The citizens could see in the union catalog in Paris what was available in each district and what was available in Paris itself (Norris 1939).

In the eighteenth and nineteenth centuries national libraries were established in many European countries, amongst them the National Library of Iceland in 1818 (Jon Jakobsson 1920; Gates 1968).

After the Russian revolution, between 1918 and 1923, similar developments took place. Books and whole libraries were confiscated and transferred to the Lenin State Library, in which Lenin himself took personal interest (Thompson (1977).

Final words

Turning back to the present, it should worry us:

- That a sizable amount of vital information never becomes published knowledge, because it is owned by parties having a vested interest in suppressing it.
- That more and more restrictions are being put on public access to published knowledge. In some instances, it is doubtful that we can talk about publications in the true meaning of that word (to publish is derived from the Latin word publicare, meaning: to make public) as some of the computerized documents are issued with limited distribution and restricted use.
- That in our knowledge based information society, **the power** to control:

*** which pieces of information become published knowledge**

*** how publications are advertised and promoted, actually fewer and fewer thoughts and ideas are being promoted**

*** which parties get to buy access to the publications**

*** who gets to use the access once it is bought**

resides with **private parties** with vested interest in making money.

Should their interests turn to something else, like for example gaining political power, the really big rockslides will fall, shaking the basis of democratic societies and in the end destroying them.

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THESES AND DISSERTATIONS FOR THE NEXT MILLENNIUM

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Abstract: All educational institutions granting higher degrees have the responsibility to archive copies of their dissertations and theses. While some people prefer the peer-reviewed articles that should emerge from the work, others find value in the originals. This debate aside, dissertations and theses present an intriguing opportunity for electronic archiving and retrieval. Is electronic storage feasible, economical, and reliable? What are the copyright considerations? Will it change how and what students submit? What does a librarian need to consider before moving towards electronic storage? The technology is developing and librarians need to consider how to use it.

Keywords: Copyright; Dissertations, Academic; Electronic Publications; Intellectual Property

Introduction:

An underlying principle of scholarship is that original work should be disseminated to the community. Theses and dissertations represent the original work of graduate students. University libraries traditionally archive and provide access to this work, thus encouraging dissemination (DesJardins 1998). With the advent of electronic publishing, some institutions are exploring electronic theses and dissertations (ETDs) as a means of improving access as well as efficiently archiving them. The following overview provides background on ETDs, a brief discussion of the issues, and advice for institutions considering implementing them.

Why worry about theses and dissertations?

Why should we even consider new ways to handle theses in our institutions? Three arguments bolster the case for focusing attention on theses: increased volume in the number created, evolving perceptions of value, and problematic access.

The rate of graduate degrees conferred in many disciplines is increasing. Consequently, the growing volume pressures on physical space and technical services workflow. Some estimate that 40,000 doctoral degrees and 360,000 masters degrees are awarded in the

United States annually resulting in approximately 100,000 theses and dissertations (Fox et al. 1996). *Science and Engineering Indicators 1998* shows steady output over the last 20 years in the United State for degrees in the natural sciences (see Table 1). In 1997/98, Oregon State University conferred 232 doctoral degrees and 669 masters degrees; the OSU Libraries added over 500 theses and dissertations with 1997 and 1998 publication dates. University graduate school offices and libraries must handle this output.

Table 1 Graduate Degrees Granted in the United States

	1975	**1985**	**1995**
Physical Sciences	3,076	2,934	3,840
Atmospheric, Oceanographic & Earth Sciences	625	599	778
Biological & Agricultural Sciences	4,402	4,903	6,406
TOTAL	**8,103**	**8,436**	**11,024**

Over the years, theses and dissertations have been both denigrated and lauded. To some, they are "the ultimate homework" (Fox 1985) while others view them as "the first work of the scholar" (Rutledge 1994). Studies reveal that theses are used, and hence valued, in varying degrees according to discipline and type of user. A recent British survey of recent doctoral students, their major professors, and librarians found that 86% consulted a thesis or dissertation in the course of their work (Roberts 1997). Rutledge summarizes many usage studies with a range of observations; one citation study found scanty use of dissertations in the hard sciences while another noted a rising level of dissertations cited in the geological literature (1994). Usage varies by discipline, with some using theses extensively – library science and education, for example. Primary users appear to be graduate students (Repp & Galviano 1987; Lee-Smeltzer & Hackleman 1995). However, staff members at Virginia Polytechnic Institute and State University (Virginia Tech) have found a wider variety of users of ETDs including occasional heavy use by commercial research and development organizations (Fox *et al.* 1998).

The question of usage is a question of access: "They aren't made adequately accessible because use is thought to be low, and, in practice, they won't be used because they aren't easily accessible" (Rutledge 1994, p.56). Currently, enhancing access to theses and dissertations beyond borrowing the original includes indexing them in broadly used resources and publishing the material in either journal or book form. Few masters theses are indexed broadly, so access is very limited. Doctoral dissertations fair better as many are indexed in *Dissertation Abstracts*.

The academic myth that the good ones get published is not necessarily so. An interesting 1975 survey showed that one third of American academicians never published (Ladd & Lipset 1975). Lopez (1988) looked at the top five universities in Political Science and Sociology, surveyed authors of dissertations, and found that only 50-60% of these "good" dissertations were published as books and articles. Others have found similar results with variance by discipline -- some of the hard sciences having a higher success rate than humanities and social sciences (Lopez 1988). Personal experience reveals that not all good, original work gets published-- particularly masters level work in aquaculture and marine mammal science. Reasons vary from lack of interest on the student's part, lack of follow-though by the major professor, or lack of outlets.

So, as the volume of theses and dissertations ratchets up and shelf space is consumed, storage and access appear to be problematic. Granted, the situation has improved with greater indexing and better coverage in the electronic databases, although an update of Lopez's and Hartman's 1988 study could be done to verify this. Online university catalogues make it possible to locate theses. Even if once located, however, they can be difficult to borrow. These factors have led several universities and their libraries to examine ETDs.

Why consider electronic theses and dissertations?

ETDs are an intriguing means of archiving and making graduate students' work accessible. They have several strengths.

• Enhance access through open access as well as more complete cataloging.
ETDs are easily searchable if located and linked correctly. They can be accessed both locally and remotely via the Web. Usage at Virginia Tech has increased dramatically since making theses and dissertations web-accessible (Scholarly Communications Project 1998).

• Allow experimentation with digital collections.
Theses and dissertations as a discrete part of our collections provide an opportunity to move towards digital collections. They are manageable; they come into our collections in a proscribed way; and we have sole institutional responsibility to care for them. They are a potential test digital collection.

• Encourage students to publish electronically.
Graduate student education is evolving as is scholarly communication. Students need to be well-versed in electronic information. That means not only knowing how to access it, but also how to create it. ETDs are a means of codifying electronic publication.

• Integrate a wider range of formats and information.
ETDs can have more dimensions than print ones. They can be less linear and more expressive including images, sound, and data files. For example, a physical

oceanography student could include her computer model of eddies in full color and motion.

• Save time.

Graduate students would save time in submitting their work. At Virginia Tech, students submit via the Web, attaching the ETD and associated files. Consider the student who had to reformat and reprint her thesis at least twice due to a persnickety Department Chair. That meant four trips to the main Oregon State University campus or almost 500 miles of traveling-- and a good deal of ranting and raving. If it had been an ETD, the file could have been sent back and forth, reviewed, and corrections attached. Technical services would save time in cataloging and processing. Users would find theses and dissertations in a more timely fashion. For example, York University and the University of Toronto found that it currently took, on average, one year for a print thesis to get through the entire technical process and on the shelf ready for use (DesJardins 1997a). An electronic one could be opened and used soon after being accepted by the graduate school.

• Save shelf space.

Instead of more shelving and additional archival quality storage, we would add another file server or more electronic storage.

• Save money.

Saving graduate students money for copying and binding is a plus. Saving libraries money is perhaps more elusive.

What are ETDs?

Technically, ETDs are electronic files in a standard format archived on a server and accessible via an electronic gateway. The formats currently in vogue are Portable Document Format (PDF) and Standard Generalized Markup Language (SGML). Adobe Acrobat, a readily available PDF reader, allows a document to retain its formatting and graphics, facilitates indexing, and is easy to use (Weisser et al. 1997). PDF serves as an "electronic wrapper." The drawbacks of Adobe Acrobat are its proprietary nature and the limitations of searching and indexing.

Standard Generalized Markup Language is an evolving standard for web based documents. SGML is "an internal standard for the definition of device-independent, system-independent methods of representing texts in electronic form" (Sperberg-McQueen & Burnard 1998). It relies on the use of a set of tags that serves as the "grammar" for a given document and is developed so that it can be submitted and converted to a format that preserves its formatting while lending itself to electronic access.

Including images, video, and audio allows the content to expand from traditional text and figures to a myriad of options. Standard formats for these are emerging (Fox et al. 1998; DesJardins1997b). Once the file is created and submitted to the institution, it is stored on a central file server and a gateway is created for users.

What is the history and status of ETDs?

In 1987, a meeting at University Microfilms (UMI) led Virginia Tech to help fund development of an SGML format. Since then, Virginia Tech has pursued ETDs energetically, working with the Southeastern Universities Research Association and Southeastern Libraries Network. In 1996, the U.S. Department of Education funded the creation of the National Digital Library of Electronic Theses and Dissertations (now known as the Networked Digital Library of Electronic Theses and Dissertations). The Library had 36 members worldwide as of July 1998 and is very pro-active in encouraging others to join (Networked Digital Library 1998).

While Virginia Tech is the most visible institution in the field, UMI has launched its Digital Dissertation Project to better support scholarly communication (and perhaps its bottom line.) Since 1997, UMI scans all theses and dissertations it receives and creates a PDF file. It currently has well over 60,000 titles digitally available and linked through Dissertations Abstracts (Fox 1998). This number compares to 1200 for Virginia Tech.

Table 2: Useful Resources

Joint Electronic Thesis & Dissertation Project	http://www.fis.utoronto.ca/etd	good overviews and discussion of the issues
Networked Digital Library of Electronic Theses & Dissertations	http://www.ndltd.org/	practical help and links to relevant material
UMI Digital Dissertations	http://wwwinfo.umi.com/solutions/	explanation and demonstration of commercial endeavor
University of Texas at Austin/ Report of the Ad Hoc Committee	http://www.utexas.edu/orgs/organizations/dissertations.html	example of university working group recommendations

What are the issues for librarians?

It is one thing to read about what others are doing, and another to do it. The issues to consider surface consistently and can be grouped around three processes: getting ETDs into the collection, keeping them in the collection, and making them accessible. Some elements are straightforward; others are not. Some only involve the library while others require cooperation and coordination across campus.

Getting ETDs into the collection

Getting ETDs into the collection requires that a student create it before the library can receive, catalog, and process it. More and more, libraries are becoming involved in helping students create their work. For example, the Guin Library at the Hatfield Marine

Science Center in Newport, Oregon houses the student computer lab and at times, the staff feels inadequate in dealing with software questions. Librarians are skilled in teaching about citations and search strategies, but often need to make some alliances with others to teach strategies and skills for the creation of electronic documents. The equipment and expertise should be accessible to all students. So, both can be located in departments, computer labs or libraries. Oregon State University's expanded main campus library will house an information commons complete with equipment to access and manipulate electronic information. There, students will find assistance from student workers and support staff in the creation of electronic documents. Librarians will have to work with others on campus to ensure that students are trained and that standard formats are adopted that are simple to use.

Once created, the library has to receive, catalog and process the theses. Will this be done by a simple file transfer or will staff members need to login to a controlled system? At Virginia Tech, once the thesis is reviewed and accepted by the Graduate School, it goes to the library collection. There, the cataloguer logs in to the ETD system and creates a MARC record from the information form submitted by the student (McMillan 1996). This form can provide extensive information including keywords, notes on appendices and illustrations, and even an abstract. Such information would greatly enhance most cataloging records, and keep theses and dissertations from languishing while librarians catch up with the original work needed (Lee-Smeltzer& Hackleman 1995). Virginia Tech estimates processing costs of $3.20 per electronic volume versus $12 for a print one (DesJardins 1997b).

What about the appendices and problems? Using the Virginia Tech model, the Graduate School is responsible for reviewing the ETD. It is probably the appropriate place for review as the student is still around. If it is done by the library, the student will have graduated and moved on, and will not be available to provide a missing piece or explain a non-standard format.

The ETDs move out of the cataloguer's file to a permanent machine. That machine needs to have sufficient storage and be easily accessible. Most ETDs currently require about one megabyte of storage. Those with images will require substantially more -- 5-10 megabytes (Fox et al. 1996).

Keeping ETDs in the collection

Nobody has a perfect solution to preservation and storage. Virginia Tech talks about a three part plan that includes maintaining standards, conducting multiple and frequent backups, and refreshing when necessary (DesJardins 1997b). UMI maintains two servers, one for access and one for archiving. It also still keeps multiple formats -- electronic, CDs, print and fiche.

Tackling the preservation issue means deciding who is responsible for what. The student is one place to start. In *Preserving Digital Information*, creators of digital information objects are responsible for the creations (Task Force 1996). While fine in theory, students rely on the University and its library to archive their theses. The Library has traditionally been responsible. However, if the server housing the ETDs is located outside the library and maintained by non-library staff, agreements must be arranged to assure the safe archiving of the ETDs. Another option for archiving is an outside agency or consortium. UMI serves as something of an archive and central clearinghouse in the United States and has been adding some Canadian dissertations since 1990 (Olson 1995). The Networked Digital Library is a repository for its members and has storage for an estimated 40 million ETDs. The National Library of Canada is the recognized repository for Canadian theses and dissertations. Some combination of local and remote archiving is a possibility to consider.

Once the ETDs reside somewhere in some kind of standard format, what happens to them in ten years?

There are two very different approaches: refreshing and migrating. Refreshing means copying them 'as is' to a new machine and assumes that the format is still readable. This may be fine if the original standard is still a standard. Migrating means converting to a new standard or an updated version. Migration is potentially much more expensive but is the right thing to do. The Task Force on Preserving Digital Information found that "as long as the preservation community lacks more robust and cost-effective migration strategies, printing to paper or film and presenting flat files will remain the preferred method of storage for many institutions" (Task Force 1996). Exon suggests that "the best chance electronic information has of being preserved is that it should go on being used, regularly and continually (1998, p.3). In other words, electronic information is not robust and libraries must create effective strategies if ETDs will be accessible in years to come.

The cost is another intriguing aspect of the storage issue. Reliable figures are scarce. People at Virginia Tech estimate that disk space for 1000 ETDs would cost less that $3,000 annually (Fox et al. 1996). That can add up over time. The Task Force on Digital Preservation compared print to digital depositories using a model developed by Yale Library. Those same 1000 ETDs would cost $210 annually to shelve in storage. Even expanding that to less compact shelving, it still is significantly less than digital. However, while digital storage is more expensive, digital access is cheaper. Enhancing access must be the main reason for considering ETDs.

Making ETDs Accessible

Onsite access involves supplying adequate equipment for viewing, the right software, and printing capabilities. The equipment and software will follow from the decisions made about format standards and preservation approach. A potential pitfall is the specter of generations of technology, something many libraries already have to deal with. They do not seek out additional layers. Another pitfall is the cost of printing out the ETDs. Many libraries are absorbing growing printing costs as information moves to electronic format. Libraries need to consider whether savings from binding will go towards printing on demand or if a pay-to-print system should be implemented.

Access for both local and remote users demands a usable gateway with a good search engine. The online catalog with links in the 856 field would provide unified local access. Additional links or web gateways are probably needed to take full advantage of the broader search possibilities.

Increased electronic access can bring security problems. It is imperative that ETDs remain unchanged once submitted and accepted. The locked vault in Special Collections seems like a pretty simple security solution compared to the complexities of electronic document security. Levels of access may be needed with passwords for those needing to do file maintenance. Security must be discussed as part of long-term storage and maintenance plans.

What about information ethics?

So far, the issues are technical: format, maintenance, processing workflow. What about issues of information ethics: copyright, academic publishing, and plagiarism? These issues cause many students to look the other way or when forced to listen, their eyes glaze over. These issues are crucial when considering ETDs as they press students to decide about copyright, free access, and academic communication.

These entities (ETDs) will be in library collections because they have been released by their creators for the use of others. The copyright resides with the creator, with the student. One exception is if the student did the work as a paid contractor (the usual graduate student assistantship does not count.) Occasionally, a thesis leads to a patent; that patent is almost always owned by the university; but the copyright on the publication is still the student's.

Students sign agreements about distribution and they should question what they are signing. At OSU, the release is for use by library readers. Virginia Tech has a non-exclusive license to archive and make theses available in all forms of media. UMI negotiates for the exclusive right to distribute copies in or from a microfilm copy, and a non-exclusive right to archive and make copies on demand. These layers of licenses can be contradictory, confusing and potentially harmful to a student's growth as a scholar. A license to distribute in all forms does not automatically restrict access; if an ETD is on the web, there is the possibility that anybody can get it. Virginia Tech students were concerned about the effect that wide-open access to their work would have on their ability to publish (Young 1998). Publishers opinions are mixed on whether they consider ETDs prior publication (Guernsey & Kiernan 1998). Virginia Tech has instituted levels of access to alleviate the concerns. Theses range from full access to no access until the student releases the ETD. A student should be encouraged to investigate the state of her discipline and its publication policies before deciding whether to publish electronically. The publishing field is constantly shifting and it is difficult to track the changes.

Discussing ETDs provides a venue to debate open and free access to theses and dissertations versus a student's right to publish for reputation and money. If some ETDs are widely popular, should that student get some financial reward? Or should she be content that she has contributed to the growth of knowledge? At UMI, if a work is purchased seven times or more in a calendar year, that author gets royalties (Savage, 1996). It happens rarely. Yet, some ETDs at Virginia Tech have been accessed 9,000 times (Fox et al 1998). Is the information free through the library or should users pay? Many faculty members are concerned with plagiarism. ETDs do not change the concern one way or another, except that it is easier to plagiarize by cutting and pasting out of an electronic document than a print one. This is not a format question, but rather an ethical one. Are librarians and faculty members explaining the nuances of licensing? Are institutions of higher education doing a good job teaching the ethics of scholarship, from copyright to plagiarism? These questions will have to be addressed before implementing ETDs.

Are ETDs in your future?

Before committing your institution, look at what others have done. Virginia Tech has experience and is willing to share it. The technical issues alone are complex, let alone the philosophical ones.

Decide if ETDs make sense for your institution and its disciplines. There is variety in how researchers in different disciplines use and value theses and dissertations. Surveying in-house use and inter-library loans would provide helpful information (Lee-Smeltzer & Hackleman 1995). A starting point would be to focus on a select number of disciplines or departments that are important to your institution's core mission. If your institution and its people do not place value on these works, then perhaps it would be more logical to put effort into other parts of your collection.

If there are indications of interest in better access to theses and dissertations, broaden the discussion of ETDs to include the faculty, graduate school, and students. It is critical that the faculty and students share an attitude that supports exploring electronic publishing. They also need to have the skills to create the publications. So, a campus-wide assessment of skill levels would be important. Eventually, a task force or committee would take the information gathered, synthesize it and make recommendations on whether to implement ETDs. This would lead to development of policies and guideline for creation and archiving, drafting an implementation strategy, and deciding who is responsible for teaching how to create ETDs.

All of this requires institutional commitment. ETDs are intriguing both technically and educationally. Mere interest in the technical aspects will not be enough to shape graduate student scholarship in the next millennium. Institutional commitment to electronic scholarly communication is the key. This means money, because any major shift to ETDs takes some capital. If Virginia Tech is a model, it takes a lot. It also means a clear understanding of the interplay of student's rights, open access to information, and scholarly communication. An institution that provides adequate access, supports the creation of electronic publications with equipment and expertise, and teaches the ethics of information can tackle the question of utilizing ETDs. Without such commitment, ETDs will be just another technical comet and an opportunity to explore new ways of promoting graduate student work will fade.

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WHAT EVERY LIBRARIAN SHOULD KNOW ABOUT PUSH AND INTELLIGENT AGENTS: OR, HOW TO INCREASE YOUR GEEK FACTOR

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ABSTRACT: Both push and agents are decades-old ideas that have been given new life with the advent of the World Wide Web. This presentation will briefly summarize the current state of both technologies and provide an historical context, emphasizing that the concepts of pushing information to our clients and acting as their agents is certainly not new to librarians. Possible strategies for employing the modern versions of these technologies in libraries will be explored in detail.

DATABASE ADVISOR: A GUIDED TOUR

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ABSTRACT: This paper reports on the Database Advisor (DBA), a web-based front-end to all sciences bibliographic and full text databases to which UCSD has remote access. Database Advisor was initiated and developed by science librarians of the University of California, San Diego (UCSD) to increase awareness and use of the bibliographic databases available to our faculty, staff and students. This paper will focus on the project scope, search capabilities and user interface. It will include a brief description of the web technology employed and the development process. Methods of using Database Advisor in reference and instruction, and information about the source code will also be presented. I invite you to take a look at Database Advisor at: http://scilib.ucsd.edu/Proj/dba/

Introduction

The Database Advisor is a web-based front-end to all sciences bibliographic and full text databases to which University of California, San Diego (UCSD) has remote access. Database Advisor (DBA) software was initiated and developed by Science Libraries of the University of California, San Diego to increase awareness and use of the bibliographic databases available to our faculty, staff and students remotely. The development process, Web interface, search capabilities, current status and future plans are described.

To see the Database Advisor in action, visit the public version for the Sciences at: http://scilib.ucsd.edu/Proj/dba/dba_public.html. Source code information is available at: http://scilib.ucsd.edu/Proj/dba/code/dba-source.html

Development phase

In 1996 the UCSD Science Libraries had over 25 science & engineering databases with access via Web, Z39.50 and telnet. We realized that faculty, students and library staff needed help deciding which database to begin searching and which database would have the best coverage for the research topic. We also wanted to increase use of some expensive and underutilized databases. Database Advisor was created to aid database users in selecting the best database for their query and to increase the use of underutilized databases in the sciences. This new product is designed to increase awareness and use of the bibliographic databases available to faculty, staff and students. DBA helps guide researchers to appropriate science databases available at UCSD for locating articles and other materials on a particular topic.

We needed a tool that would simultaneously search all our databases (no commercial product was available). Our development criteria included: let the user specify terms, automatically perform a keyword search of all available science databases, quickly return the results on the query, work like a DIALOGWEB's DIALINDEX® search, sort results so the user can see where each database stands relative to the others, allow the user to refine the search, and include a Web link to each database from results page.

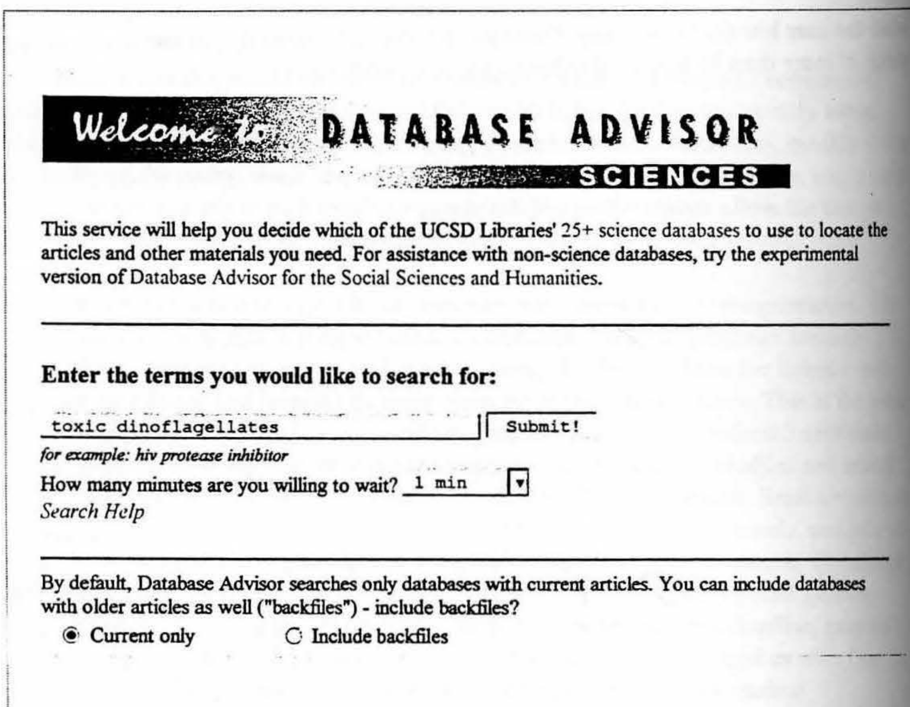
Database Advisor was developed by an interface team and a team of programmers. The DBA Interface Team included three Science Librarians: Susan S. Berteaux from the Scripps Institution of Oceanography Library, Christy Hightower from the Science and Engineering Library and Jennifer Reiswig from the Biomedical Library. This is the team that developed the Web-based user interface, graphics, search help, selected databases and assigned them to appropriate subject categories, wrote database profiles and search strategies. We limited searching capabilities to the "profiled" databases. Search strategies were designed to achieve an equivalent search of title words, abstract words, and subject terms in each database comparable to a MELVYL® system keyword search. To achieve uniformity across databases, DBA's search strategies are by necessity rather generic. Keeping graphic load to a minimum, the Interface Team developed a familiar, easy-to-use Web interface. In the final design stage we used focus groups helped us with fine tuning features. The Science Libraries at UCSD hired a team of three student programmers to write the code. The programming team was managed by Christy Hightower, a science librarian. A single programmer currently on staff in the library is now maintaining the code, adding and adjusting database scripts as necessary.

A familiar, easy-to-use Web interface

DBA works somewhat like a DIALOGWEB's DIALINDEX® search -- on a much smaller scale, and with results customized to our unique local database mix. Database Advisor's appearance (input boxes, point-and-click, radio boxes, etc.) will be familiar to Web users. For example, in the Web environment hitting the "enter" key sends a search query, so we observed this convention. On the Welcome Screen it is obvious where the user enters search terms (Fig. 1).

The user is given options to change default settings. Searching current files is the default, but the user can choose to include backfiles. Most users want to search ALL databases quickly but the user can select subject categories thereby limiting the databases searched (Fig. 2). Most search results are listed within 1 minute, but if more time is needed the user can increase the search time --this is a useful feature when databases timeout before returning results. The Help section provides guidance in structuring DBA searches (Fig. 3).

When the user hits the "enter" key, Database Advisor automatically performs a keyword search of more than 25 science databases (see Appendix A).


Welcome to DATABASE ADVISOR SCIENCES

This service will help you decide which of the UCSD Libraries' 25+ science databases to use to locate the articles and other materials you need. For assistance with non-science databases, try the experimental version of Database Advisor for the Social Sciences and Humanities.

Enter the terms you would like to search for:

toxic dinoflagellates | Submit!

for example: hiv protease inhibitor

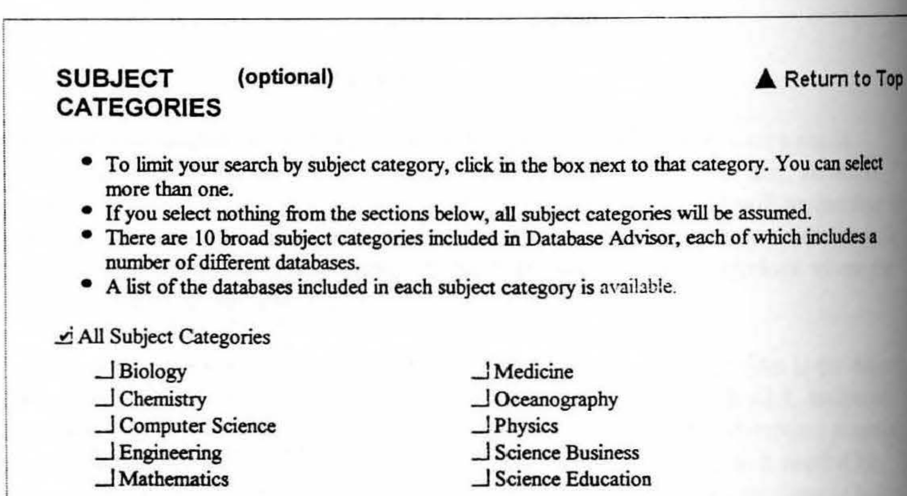
How many minutes are you willing to wait? 1 min

Search Help

By default, Database Advisor searches only databases with current articles. You can include databases with older articles as well ("backfiles") - include backfiles?

◉ Current only ○ Include backfiles

Figure 1. Welcome Screen -- enter search terms


SUBJECT CATEGORIES **(optional)** ▲ Return to Top

- To limit your search by subject category, click in the box next to that category. You can select more than one.
- If you select nothing from the sections below, all subject categories will be assumed.
- There are 10 broad subject categories included in Database Advisor, each of which includes a number of different databases.
- A list of the databases included in each subject category is available.

☑ All Subject Categories

☐ Biology	☐ Medicine
☐ Chemistry	☐ Oceanography
☐ Computer Science	☐ Physics
☐ Engineering	☐ Science Business
☐ Mathematics	☐ Science Education

Figure 2. User selects Subject Categories

SEARCH HELP

▲ Return to Top

Database Advisor (DBA) will take the terms you specify and automatically perform a **keyword search** in over 25 different databases. Your results indicate the number of **hits** that would be found in each one, ranked from the most to least hits. You can then link directly to the database of your choice to perform your search. Here are some tips to help you use **Database Advisor** most effectively:

Tip	DO	DON'T
Keep it simple • limit to one or two main concepts • don't use multiple synonyms; use only one word for each concept.	bridge corrosion	bridge corrosion rust acid rain precipitation
Boolean searches • Do not use AND, OR, or NOT. • AND is implied between each word.	aspirin headache	(aspirin OR ASA) AND (headache OR migraine)

The following are **not** available in Database Advisor, but may be available in one or more individual databases when searched directly:

- author searching
- phrase searching / word adjacency
- single letters and special characters - e.g., π, Σ, é
- wild card characters / truncation symbols - e.g., * ? #
- case sensitivity - e.g., MIT vs mit

For more help
For personalized help with science database searching, contact the reference desk of the library you use most.

Biomedical Library: 534-1201
Medical Center Library: 543-6520
Science & Engineering Library: 534-3258
Scripps Institution of Oceanography Library: 534-4817

For assistance with non-science databases, try Database Advisor for the Social Sciences and Humanities. Technical details about DBA's search strategies are available.

Figure 3. Search Help

DBA spawns a search process for each of our nine database vendors and returns the hits on the query (Fig. 4). Results are ranked, so the user can see where each database stands relative to the others. Each database has a link that can be followed to access the database and continue the search process. A legend (Fig. 5) explains the Results page. At this point the user can examine the database profiles (Fig. 6), refine all aspects of a search (Fig. 7), or click on a database name to run a search in that database.

DATABASE advisor **RESULTS**

You searched for: **toxic dinoflagellates**

Help reading this page Feedback is appreciated!

Want to refine your search?
Technical details about DBA's search strategies are available.

# Hits	Database Name & Description
447 :	MOFR: Marine. Oceanographic & Freshwater Resources A Profile International marine and oceanic information, as well as estuarine, brackish water, and freshwater environments
163 :	ASFA A Profile Science, technology and management of marine, fresh & brackish water environments & organisms
89 :	BIOSIS Previews A Profile Life sciences and biology; indexes over 6000 journals, plus books and conferences
22 :	Current Contents Profile Covers 6500 scholarly journals in all disciplines from 1989+
17 :	National Science Foundation Funded Projects A Profile The NSF Grants and Awards database contains information, including abstracts, for NSF awards made since 1989
16 :	MEDLINE PLUS A Profile Citations to journal articles in all areas of medicine and health sciences
14 :	MAGS: Magazine & Journal Articles A T Profile Cites general-interest and selected scholarly articles, many with abstracts, some with full text
6 :	Applied Science and Technology Abstracts A Profile Indexes literature emphasizing the applied aspects of physical science and technology
6 :	GeoRef A Profile An index to materials on geology, geophysics, seismology, earth sciences and the environment

Figure 4. Results screen

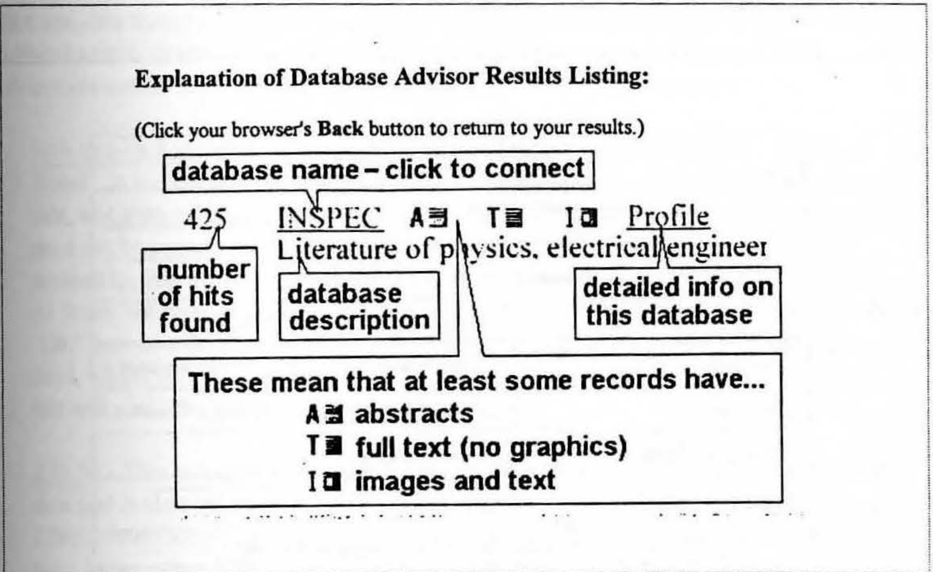


Figure 5. The "Legend" explains the Results screen

Database Name	ASFA
Search URL	http://scilib.ucsd.edu/cgi-bin/asfa-ws
Title URL	http://scilib.ucsd.edu:80/cgi-bin/asfa-ws/www.csa.com/csa-home.htm
Starting date	1992
Ending date	present
Abstracts	Y
Full text	N
Full image	N
Subjects	Biology, Chemisty, Oceanography, Science Business
Update frequency	Monthly
One line description	Science, technology and management of marine, fresh & brackish water environments & organisms
One paragraph description	The ASFA database provides citations and abstracts of the world's literature dealing with the science, technology and management of marine, freshwater and brackish water environments and organisms. This unparalleled source combines three major files that cover the biological sciences and living resources; ocean technology, policy and non-living resources, and aquatic pollution and environmental quality. Two specialized files are also included, which cover the increasingly important fields of aquaculture and marine biotechnology. The complete ASFA database provides the most comprehensive coverage; if preferred, the five, more focused files that comprise this unique database are also available as separate databases. ASFA is produced by Cambridge Scientific Abstracts in cooperation with four United Nations agencies and a growing network of national research centers throughout the world.

Figure 6. ASFA database profile

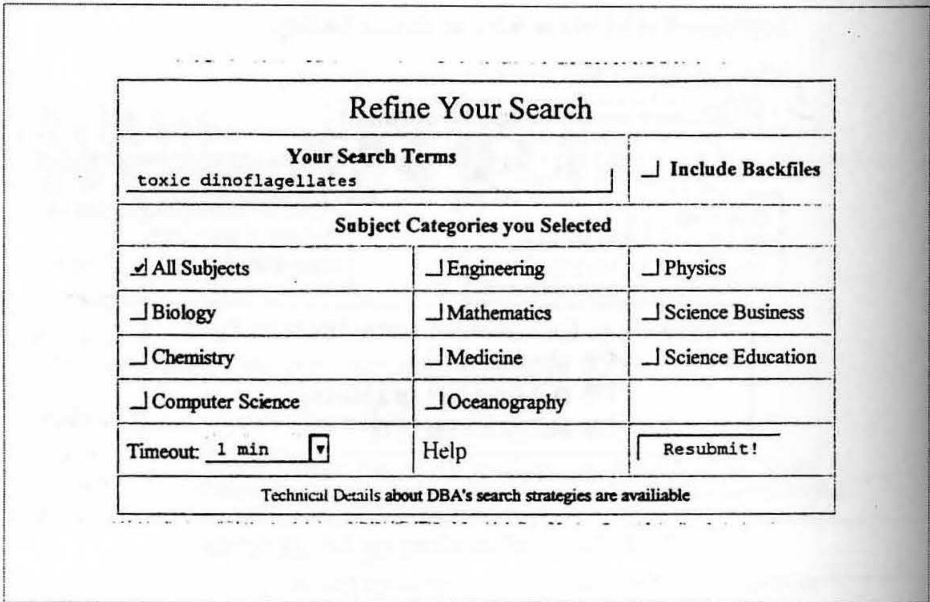


Figure 7. Refine Your Search

Search capabilities of DBA

A Database Advisor search differs from searching in a specific database. Searches are limited to the databases profiled by the librarians and databases in the user-specified subject categories. While users supply the keywords, the librarians have already supplied the search strategies to standardize the search across the various databases. Precise technical search strategies and fields are used to search each database. Our goal in designing search strategies was to achieve an equivalent search of title words, abstract words, and subject terms in each database. This was not always possible because of the differences in the fields available and the way in which each database searches these fields. To achieve uniformity across databases, DBA's search strategies are by necessity rather generic.

Database Advisor guides users in choosing a database, it does not perform the most precise search possible in each database. Using the unique features and search capabilities of a database, more precise searches can be performed and users can refine their search as appropriate for each database used. For help formulating the best search strategy once they choose the database they wish to use, users consult help files provided by the specific database.

DBA searches three types of **bibliographic** databases: web, Z39.50 and telnet. Precise technical search strategies used and fields searched for each database in Database Advisor are available at: http://scilib.ucsd.edu/Proj/dba/search_strat.html.

Web Search Strategies - The MELVYL® keyword search is what we considered "ideal". It searches for any of the search terms in any of the following fields: subject, title, and abstract. Each of the search terms must be present in at least one field, but need not be present in all fields. Because most web databases search each field separately, this is difficult to duplicate without multiple searches on the same topic. At times, we were forced to "AND" the search terms together and perform a Boolean "OR" between the search fields. This requires all the words to appear in at least one field, which is more restrictive than the MELVYL keyword search. We hope that this will yield the best results to the user.

Z39.50 - This is a type of database request protocol. It is specialized for retrieving data and is also a fast interface. Most of the MELVYL® databases are hooked up to a Z39.50 interface. All databases that we access via Z39.50 are searched the same way. In the case of MELVYL® databases, our search replicates a FIND KEYWORD search.

Telnet Search Strategies - We use telnet as a last resort, preferring to access a databases via Web or Z39.50. Some telnet searches take time to process because there is no way to "jump into the middle" as we do with Web databases when we know the URL.

Database Advisor does not search Yahoo or the rest of the Web. DBA was designed to search bibliographic indexes and abstracts, like Inspec and Compendex, because we lacked a good tool that searched across databases supplied from so many different vendors. Several meta-search engines (like Inference Find and Metacrawler) exist that traverse the publicly accessible webspace. Perhaps in the future we will offer a link to one or more of these meta-search engines from DBA, as long as the results remain useful rather than overwhelming or confusing to the user.

We are investigating ways in which DBA might alert people to the existence of databases in their subject area that are currently only available in print or on CD-ROM in the library. The Social Sciences and Humanities Library at UCSD is experimenting with ways to display reminders to consider these other databases on the DBA results page.

Current Status

In September 1997 Database Advisor was released for use in the science disciplines of oceanography, bio-medical, science and engineering at UCSD. A steady increase in usage indicates the target audiences -- undergraduate and graduate students, reference librarians and faculty -- are discovering and using more of the databases available to them. Currently DBA averages 81 searches a week. Not surprising, the peak hours of use are from 9am-5pm, Monday through Friday. 11% of overall usage occurs on weekends, which implies remote usage. We also collect information about the nature of the searches performed: the keywords and subjects used, whether the search is refined or not, what WWW browser was used, etc. This will allow us to perform more detailed analysis of Database Advisor usage patterns in the future.

A fully functional version of DBA is available to users of UCSD Internet accounts (i.e., those using a UCSD Academic Computing account, or those in an on-campus building). When DBA first rolled out, the Web-spiders picked up on it immediately and usage increased dramatically. Database Advisor was searching UCSD-licensed databases from non-UCSD IP addresses: 35% of all DBA searches were from non-UCSD people and 12% of the searches were from indeterminate sources. Non-UCSD remote users were exercising vendor servers and the high volume of usage by non-UCSD users was using up ports, denying access and slowing down service to our own users. Obviously, non-UCSD usage of databases has licensing implications -- even if non-UCSD users cannot connect and run searches in databases from DBA results they were still exercising vendor servers. Because other libraries want to see a "live demonstration" of how Database Advisor works, the decision was made to create a public version. Some databases are removed from the public version of DBA due to license restrictions. Anyone with Web access, regardless of UCSD affiliation, can use the demo version of Database Advisor. However, many of the databases that show up on the Results page are restricted to University of California (UC) or UCSD users, and may not allow access from outside IP addresses. To see DBA in action, visit the Public Version of DBA Sciences at: http://scilib.ucsd.edu/Proj/dba/dba_public.html

How to get source code

The source code for Database Advisor (DBA), Sciences version, is available under the terms of the GNU General Public License (http://scilib.ucsd.edu/Proj/dba/code/dba-source.html). The Database Advisor program is free software. You can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation (either version 2 of the License, or any later version).
The program source code is distributed in the hope that it will be useful, but without any warranty. For more details about the GNU General Public License see: http://www.gnu.ai.mit.edu/copyleft/gpl.html.

To run DBA at your site you need a UNIX computer with Internet connectivity and the equivalent of an Apache Web server (common in academic settings). You need the following software to install Database Advisor:

Z 39.50 API Client software for Z39.50 connections: You obtain the code from http://lindy.stanford.edu/~harold/z3950/www_gateway.html

GNU C compiler: To compile the zclient code for your machine. For more information on the GNU project and a list of FTP sites for GNU software go to http://www.delorie.com/gnu/

perl (version 5.004_01 or later): You can get the lastest version of perl and the modules listed below from: http://www.perl.com

Future plans

The Social Sciences and Humanities version of DBA will go live in Fall of 1998. Ways to alert users to the existence of important databases still only available in print or on CD-ROM in the library are under investigation. The concept of "instant gratification" that would take users directly to the results of a search when they choose a database to use will be pursued as funding permits. This function presents some technical challenges and may take some time to implement. Six other University of California campuses have expressed interest in installing versions of DBA on their campuses in the next few months. The California Digital Library may be interested in Database Advisor.

For more information about Database Advisor, the source code, hardware or software requirements, please contact Christy Hightower (chightow@gort.ucsd.edu) at the Science & Engineering Library, 0175E, University of California, San Diego, 9500 Gilman Drive, La Jolla, California 92093-0175.

Additional reading

Hightower, Christy, Jennifer Reiswig, and Susan S. Berteaux. June 1998. "Introducing Database Advisor". **College & Research Libraries News**, 59(6):409-412.

Subject Guide to Databases Covered

Biology Databases
- ASFA: Aquatic Sciences and Fisheries Abstracts
- BIOSIS Previews
- Current Contents
- MEDLINE Plus
- MOFR: Marine, Oceanographic & Freshwater Resources
- PsycINFO

Chemistry Databases
- Applied Science & Technology Abstracts
- ASFA: Aquatic Sciences and Fisheries Abstracts
- BIOSIS Previews
- COMPENDEX Plus
- Current Contents
- Engineered Materials Abstracts
- GeoRef
- INSPEC
- MEDLINE Plus
- METADEX
- MOFR: Marine, Oceanographic & Freshwater Resources

Computer Science Databases
- ABI/Inform
- Computer Journals
- Current Contents
- INSPEC
- MathSciNet

Engineering Databases
- Applied Science & Technology Abstracts
- Arctic & Antarctic Regions
- COMPENDEX Plus
- Computer Journals
- Current Contents
- DOE Reports
- Earthquake Engineering Abstracts
- Engineered Materials Abstracts
- GeoRef
- INSPEC
- METADEX
- MOFR: Marine, Oceanographic & Freshwater Resources
- NASA Reports and Aerospace Literature

Mathematics Databases
- Current Contents
- INSPEC
- MathSciNet

Medicine Databases
- BIOSIS
- Current Contents
- Magazine & Journal Article Database
- MEDLINE Plus
- PsycINFO

Oceanography Databases
- Arctic & Antarctic Regions
- ASFA: Aquatic Sciences and Fisheries Abstracts
- BIOSIS
- Current Contents
- GeoRef
- MGA: Meteorological and Geoastrophysical Abstracts
- MOFR: Marine, Oceanographic & Freshwater Resources

Physics Databases
- Current Contents
- DOE Reports
- INSPEC
- MGA: Meteorological and Geoastrophysical Abstracts

Science Business Databases
- ABI/Inform
- ASFA: Aquatic Sciences and Fisheries Abstracts
- Business & Industry
- Commerce Business Daily
- Computer Journals
- Current Contents
- Magazine & Journal Articles Database
- MOFR: Marine, Oceanographic & Freshwater Resources
- National Science Foundation Funded Projects
- Newspaper Articles Database

Science Education Databases
- Current Contents
- ERIC
- Magazine & Journal Article Database
- Newspaper Articles Database

TAKING CHARGE OF THE INFORMATION GLUT

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ABSTRACT: Information overload isn't new. The information explosion has lead to a superfluity of information -- databases, web sites, books, journals, listservs, faxes. Yet with all this information available many patrons complain they either can't find what the need or else they get thousands of 'hits.' The challenge of the Information Age has become turning information overload into knowledge. More information does not automatically lead to better information. Each year the problems appear to be geometrically increasing. Libraries are trying to move from quantity to quality of information provision. How to deal with data smog and technostress has been the topic of much research and publication. A variety of tools, technological and psychological, can help librarians guide and assist their patrons in dealing with the onslaught of information.

INTRODUCTION

Information was once a rare and cherished item. The few books in existed were guarded like rare treasures. Two years ago, during a visit to Austria, I had the privilege of visiting the library at the Abbey in Melk. The ceilings and walls are painted with beautiful paintings. There's gold gilt on all of the woodwork. The setting is one that encouraged the researcher to think about the things of rare and wonderful value that they were able to use there. The monks were the keepers of knowledge, even the oral history resided in the memories of the monks. Librarians continue that tradition.

Now books are plentiful and ordinary. Rutherford D. Rogers, the retired director of Yale University Libraries, in a now famous 1985 New York Times article observed the "Torrent of print strains the fabric of libraries . . . "we're drowning in information and starving for knowledge." (Campbell 1985). In less than 15 years, books have become just one, small source of information. Now a torrent of a multitude of information sources pours into our conscious and subconscious daily.

In 1970 Alvin Tofler defined "future shock" as the shattering stress and disorientation that we induce in individuals by subjecting them to too much change in too short a time. According to Berghel we are "In midst of a technological revolution that will dramatically set our century apart."

Computers were never really meant to help people. They were meant to process massive amounts of data, to break code and other things that while humans can do they are much slower at. The use of the computer as another "human" is relatively new.

More and more we are finding the great Information Age a little hard to cope with. The great mass of information available to us seems, at times, to be totally useless. Or is it becoming the case that information is now valuable because there is so much of it and like diamonds on a small subset are truly valuable. The role for the librarian in this age may well be to evaluate and grade the diamonds.

CONSEQUENCES OF INSTANT INFORMATION

If electronic tools are the great labor-saving tools of the 20^{th} century why are they causing us some much trouble? Everywhere you go you find cell phones, pagers, bigger and better computers, small hand-held electronic datebooks, etc.

Electronic devices have become all intrusive. Our expectations are now that we can get answers to questions instantly. In Regis McKenna's book *Real Time* he talks about how Steve Jobs, with Internet access at home, finds it an invasion of his personal life – people expect immediate responses. As individuals we are no different. How many of us expect instant answers from our IAMSLIC colleagues who are in significantly different time zones? And what may be even worse, we get them! We have become a plugged-in society. And in the "paperless" society paper consumption per capita in the US tripled from 1940 to 1980 (From 200 to 600 pounds) and tripled again from 1980 to 1990 (To 1,800 pounds) (Shenk 1997)

The goal of industry seems to be to perpetuate the need for more and more information. It's working! In a study by Reuter's "Glued to the Screen: An Investigation into Information Addiction Worldwide," 1,000 managers said they felt compelled to gather more information than ever before just to keep up (Murray 1998).

Shenk in four years of research for his book gathered 23,967 electronic pages of text, conducted 481 NEXUS searches which resulted in downloading 46.2 megabytes (14,000 pages) and visited over 1,000 web sites. He concluded: Of what value is the "Wealth of lots of information if much of it is useless to the project and takes too long to make sense of?" (Shenk 1997)

We all feel this need gather more and more information. Shenk describes his research in gathering massive amounts of information. He finally comes to the realization that "When contexts begin to vanish in a sea of data, it becomes more difficult to remember any single piece of it. At a certain level of input the glut becomes a cloud of data smog that no longer adds to the quality of life, but instead begins to cultivate stress, confusion, and even ignorance. " Somewhere along the line, the empowering eagle became an albatross." (Shenk 1997a)

In her article in *Training,* Rebecca Ganzel (1998) identifies ways in which high-tech is turning us into "stress-crazed wretches." They include:

1) An information glut. It is not the various types of technology that is overloading, it is just the mass of information that we can no longer process.

2) The frantic pace at which we are transmitting information -- overnight mail, e-mail, fax. I think that this is encouraging us not to plan. We wait until the last minute to convey information we need to others. Perhaps it's in hopes that we can gather that one more bit of information.

3) Dehumanization. We are not machines. Machines are not people. But we are losing that distinction as machines invade our lives. We give machines human characteristics (burp, blink, etc.). We give ourselves machine characteristics (multitask, memory gaps, etc.). We're slower: we communicate at about 55 bits [less than 7 bytes] per second (McKenna 1997) Humans multitask easily: paint and hum, remember something at the same time. When computers multitask they do several things very quickly, but one at a time.

4) A physical toll that computers are taking on us. We are not physically suited to be part of a machine. Our posture, our eyesight and our joints and tendons suffer when we try to be repetitive machines. Many companies are now investing considerable amounts in ergonomic assessment of their employees. They realize that prevention is cheaper and wiser than treatment.

5) Imperfection. Technology can and will double-cross you. If you the count on the computer long enough, it will let you down. One program won't open a file in another. Try opening a WordPerfect 6.1 document when you're using 5.1. How often to computers simply not function when we need them? You want to impress a patron with an Internet search and the line is slower than slow. You turn your computer on, only to find that you have no power. And so it goes.

6) Anti-social activity. This is increasing as the numbers of and speed of communication is increasing and meaningful connections are decreasing. Sally Forth, a popular Canadian comic strip, recently had a series where the couple were out at dinner and observed another couple, who had ceased to talk to one another and were earnestly talking on cell phones. Taking our cell-phone, pagers and beepers everywhere disconnects us from where we are. We video tape our outlook on the world. Through all wonders of technology, we miss connecting with those most important – those we are with right now. A Carnegie Mellon study released in September discusses this "Internet Paradox" in

depth (Kraut 1998). Use of the Internet was associated with declines in communication with family members, declines in the size of one's social circle and increases in depression and loneliness.

7) Job loss through technology – We downsize and continue to get more done. Even if the computer doesn't take your job it can cut into your home life. It's harder and harder to separate your home life. Most of our jobs wouldn't exist without computers.

8) Loss of control. The nerds rule again. For about twenty years personal computers restored some of the worker's autonomy (Rochlin 1997). Now with networks, intranets, firewalls, etc. we are back to specialists controlling our work tools and feel a loss of autonomy.

9) Fear of the unknown. Arthur Clarke wrote "Any sufficiently advanced technology is indistinguishable from magic." We've been afraid of magic since coming from the caves and before. We're just beginning to understand that it's not necessary to understand something in order to use it (Ganzel 1998).

10) The unfulfilled promise of technology. Fourteen years ago an Apple computer commercial told us that computers would change the world – that they would free us. (Johnson 1997). Yet most of us don't find life significantly different. We still do the same things, balance our checkbooks, write memos, etc. Only we now do them quicker and we have to figure out how to make the program work. The things delivered by the web tend to be rather mundane – tickets purchased, reviewing x-rays from a distance. What has transformed our culture is the sprawling network that lets millions of computers share information (Johnson 1997). It is the orders of magnitude of information. And the computer, like the car "continues to nurture the mythic dimensions of autonomy and personal freedom. But that freedom lives mostly in the world of advertising, where vehicles are pictured on mountaintops instead of in traffic jams. What is not advertised is the cost and demands of the network of roads, highways, and other elements needed to make the automobile useful. It is through the network and not the vehicle that the automobile has irreversibly transformed modern societies." (Rochlin 1997)

EFFECTS OF THE INFORMATION GLUT

The average individual encounters more information in one day than the average 17th century person did in a lifetime (Ganzel 1998). What of this information is useful to the individual? Probably not as much as we'd like to think. Irrelevant facts are insidious. Grossberger (1998) talks about the problem of all these trivial facts for the media person. What about for the librarians who have long prided ourselves as knowing?

A few years ago Dell Computers called 2,000 people and found 55% were "technophobic." In a similar Associated Press poll half the respondents said technology was leaving them behind (Ganzel 1998). A survey conducted by the Institute of the Future for Pitney Bowes showed that the average employee sends and receives 178 messages a day. 84% of these are people are interrupted six times per hour by messages with three of these being considered unnecessary (Wakin 1998). Stanford University's 1997 technostress class was an instant sellout.

What has happened to the glorious Internet that was to enhance communication between scientists and researchers? It now serves a dual role of public and private communication medium. Issues that are important to private individuals are often uninteresting and superfluous to the general public. You can see Linda's cats, Annemarie's menus for October, Steve's newly restored MGB, etc. This is changing the way we get to know one another. We run the risk of becoming isolated units in cyberspace. Public issues can be uninteresting to the individual. The latest debate over an obscure mathematical model sparks little interest in the average person. It's all out there for us to see and find when we're looking for something we think is important.

Some feelings about technology extend beyond anxiety to pathology (Ganzel 1998). There are Internet Addiction Disorder groups springing up, where else but on the Net!

Several authors have developed terms to describe the problem. Not many years ago it was information overload. As the problem grows, so do the terms. David Schenk in his recent book coined the phrase "data smog." This is described as a fog in the brain caused by an excess of bits of information. He found that it reduces attention span, disrupts family life, impairs your judgement. It crowds out quiet moments, obstructs contemplation, and stresses us out (Schenk 1997).

David Lewis, a British psychologist, calls it "information fatigue syndrome." It interferes with sleep and causes indigestion, heart problems and hypertension. In its mildest form, it sparks irritability and jeopardizes work productivity (Murray 1998).

What happens when our senses are overloaded and our brain in a fog? If forces people to resort to hyperbole and histrionics to get our attention (Schenk 1997a). Web sites become more glitzy, with sound and motion and blinking lights. Things bombard our senses even more. The problem grows.

Meeting the Professional Challenges of Information Overload In Cyberspace

While we want to lay the blame somewhere, we must remember that the Internet is credibility and value-neutral. One author referred to the Web as "multimedia mediocrity" because of the extreme variation in its sources and the lack of quality control. (Berghel 1997)

Search engines, once hoped to be a way to efficiently access the information on the Internet, now index more chaff than wheat. There are more than 140 search engines listed at Yahoo, including those that supposedly index everything to the very specialized ones - Aqueous (dedicated to sites that have water related content, but didn't have any hits on IAMSLIC), James Kirk Search engine, Next Crawler (Greek sites) Surfer's edge (Singapore sites). Now there are guides to search engines.

In June 1998 more than half of the top ten most-visited domains were Web search sites according to Media Metrix. (Lake 1998) However, one search site could provide 10 pure gold sites and another 100 pure manure. Why?

While there are major similarities in search engines in that they all 1) search an index of web sites or web pages. 2) use a search algorithm – this varies, 3) sort information – the proprietary algorithm for this is not shared by the companies (Lake 1998), no two search engines are exactly the same (Brueggeman 1997) And to make things harder, sites generally do not do a good job of explaining how they work and even if they do the average searcher sees the spot to enter the query and is off searching. A recent search for "IAMSLIC" yielded:

AltaVista	474
Excite Guide Search	0
GoTo.com	8
InfoSeek	175
Lycos Top 5%	0
Lycos	91
Magellan	1
PROFUSION	81
Thunderstone	1
Webcrawler	0
What U Seek	0
Yahoo	0

One of our biggest challenges is how to we find what we want in the vastness of cyberspace. This is not much different in theory than finding the right information in the vastness of the published word. The techniques for doing it may even evolve from our old "tried and true" techniques. We are creating gateway sites on our library web pages. These should serve as the old-fashioned pathfinders did as guides for our users. They are the sites (books) that we have sifted through to find the "best" places for our users to start their research.

For years we have cataloged books, indexed articles, and organized information. As librarians we look at metadata as a start to cataloging the multitudinous web sites. However, metadata relies on the persons putting the data out there to include the metadata, and many of them have never heard of metadata or don't understand it or see its value. We must become advocates of information organization and indexing. We must make it easy enough for the person developing the site to use it, or we will still find ourselves in the cataloging business.

We can lobby for controlling the number of public sites out there in cyberspace, a kind of "self-censorship of sites." We can encourage our patrons not to be so proud of their every web page, that they submit them everywhere. We can work to develop a standard for designers to use to exclude their less interesting pages from indexing.

Another way of helping ourselves and our patrons can be through environmental scanning. This has been a topic off and on for many years. It can be an outgrowth of the old Selective Dissemination of Information (SDI) programs. Only now the information is synthesized for the reader. This is not far removed from the "annual reviews" or "advances in" that we are familiar with, only it must be much more frequent. We see an example in the weekly fisheries report. There have been cultural problems with the acceptance of environmental scanning. Most of us believe that no one else can know our information needs and that we miss the serendipity of discovery if someone else is doing our reading for us. We as information specialists need to demonstrate the value of environmental scanning to our researchers' jobs easier.

One of the other big challenges for librarians/information specialists is to define our role. Will the structures of our jobs be altered? Will we develop new and different working relationships with our peers, vendors, and customers? The answer seems to me to be a firm maybe. Many of the answers to how our jobs will be defined in the future sound like our "old" jobs. The role of the librarian in the future will continue to be the authenticator of information quality (seems like collection development), the counselor and coach (seems like reference and instruction), the advocate of metadata and developer of ways to retrieve information (seems like cataloging), and the publisher liaison (seems like acquisitions).

Another challenge is knowing what our customers want and need to know and determining whether or not they are satisfied (McKenna 1997). We need to create organizations that constantly evaluate their success and adapts their services to correct for the failures. Librarians have surveyed patrons for years. Technology now gives us increased abilities to monitor the use and success/failures of our patrons, even those at a distance.

Another challenge is the use of appropriate technologies. There are so many modes of delivery of information now available that we must start teaching ourselves and our users what is the most effective. Books still have their place. Often for facts and figures they are still the easiest place to find a quick answer. How many of us can tell where the particular bit of information we need in a certain book is by the dark, worn spot from it's having been open there so many times. Bookmarks of web sites provide the same information and could be made even more useful if we had counters on them to indicate how often we, or our patrons, had used them. But more than this we need to remember to suit the medium to the message. Voice mail can convey emotion that, despite smiley faces, cannot be conveyed in e-mail. Lots of facts and figures are still best conveyed in writing, not by voice. We are making decisions between standalone or networked CD-ROMs versus Internet access, print versus electronic. These decisions are only increasing. We need to continue and expand our studies of the effects of the medium on the message and the user.

Meeting the Personal Challenges of Information Overload In Cyberspace

Straighten out your attitude toward information (Wakin 1998), then on to the rest of the world. Or from a more profound philosopher "We have met the enemy and he is us." No matter how much we tell our patrons 'how to do it good' until we ourselves take control of our data smog we won't understand the problem or be heard with our solutions. We need to establish our information priorities (Lively 1996).

For those of us addicted to technology this will be difficult. We need to figure out what works best for us and to learn alternate techniques. Many of these techniques for managing incoming and outgoing information are old-fashioned organization techniques

Shenk suggests: 1) Turn off the TV, 2) Leave pager and cell phone behind, 3) Limit your e-mail and others – don't forward everything to every body, 4) Resist advertising, 5) Have your name removed from e-mail marketing lists, 5) Take cleansing "data fasts" or "data naps" – regular breaks away from information.

Tips from Rosen and Weil (1997) (include: 1) Sift and trash – focus on the info you really need, 2) set limits – ration time you spend with the media and computers, 3) Respond in your own time – turn off the fax ringer, disable the e-mail ding, 4) Relax when technology makes you wait – don't get irritated while your e-mail boots or you're on hold, use that time to do small tasks or to rest, 5) Use technologies that work for you – you don't have to have every new technology with all the bells and whistles, 6) Schedule time away from information -- set aside slots for vacation, people, etc.

Other suggestions include:

- Choose the least feature-laden gadget – less to breakdown and how many times is it a feature that you really don't use anyway. Corollary: pick the right gadget for the right reason.
- Stop surfing for something to do – much like playing games
- Don't clutter listservs with "yes" and "me too" answers

We need to be the ones to control the future of information and not let information control us. We should be consciously choosing which technologies are good for us and which are not.

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POLAR WEB SITES--MOST FREQUENTLY CONSULTED FOR REFERENCE

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ABSTRACT: Web sites are a vital information resource in our polar network. This presentation is the result of a survey of librarians and users identifying the most useful polar web sites in the sciences and social sciences. The goal was to identify the most frequently consulted web sites for reference rather than the most exhaustive or best designed.

The survey was distributed electronically to the polar-lib listserve and in print to selected polar libraries identified in the World of Learning (1997).

During the presentation, the ten most frequently used sites in the sciences and social sciences will be reviewed. A handout will identify these web sites with a brief annotation about the reference questions answered from each source.

KEYWORDS: Websites

What polar resources are out on the World Wide Web? Are there many? Do the searchers find the same sites? What kind of polar information exists?

As the librarian at the Keith Mather Library of the University of Alaska's Geophysical Institute, Judie Triplehorn was interested in websites that would be of assistance to her scientists and graduate students. As an indexer with the UAF Rasmuson Library's online "Bibliography of Alaska and Polar Regions," Ron Inouye was more interested in the social sciences.

The purpose of our study was to identify the most useful and frequently consulted 1) science, and 2) non-science polar websites for reference. We were not interested in the best designed nor most exhaustive, but rather the sites which librarians find the best for responding to reference questions.

Our procedure was to design a simple questionnaire that was distributed in hard copy and electronically. Those receiving the 100 hard copies were selected from the international, public university, and research libraries with polar interests listed in the *World of Learning* (1994). The electronic version was distributed to listservers for the Polar Libraries Colloquy, the Arctic Research Consortium of the United States, etc.

We received 40 responses, most electronically. Our response rate was less than expected, perhaps due to computer-related technical problems for receiving the completed electronic forms, and most recently to delayed mail service perhaps related to the labor strike of airline personnel. However, based upon the responses to date, we have some observations, examples, and recommendations that might be of particular interest to this audience.

Survey Results

The survey results appear as an appendix for the paper as Selected Polar Websites. This composite list is a valuable tool for the identification of polar information and will appear on the Geophysical Institute website by October 1, 1998.
http://www.gi.edu/services/library/

Ideal Websites

Another part of the survey dealt with ideal websites. Here are the results of the query respondents. Their primary concerns follow:

1. *Limited Graphics*
   Ideal websites should have limited graphics. Users are interested in reducing the time it takes to load the graphics and commented that the graphics were often peripheral to the mission of the text. Frequently the images are window dressing. There was a recommended website address from Bandwidth Conservation Society for making images and graphics load faster – this is included in the handout of polar websites. With Netscape there is a way to turn off image loading which might also be used.

2. *Site Map*
   A good table of contents with clearly defined topics is considered essential. Websites with short descriptions were much easier to use than the ones with a brief title or the ones with only acronyms. Because it is difficult to keep up on all the worldwide Arctic abbreviations and acronyms, it should be standard policy to write out the organization or agency title at the beginning of each listing. Reliable, well documented information will encourage students and new users.

3. *Updates*
   Websites should be regularly updated with the date of the last change visible to the user. In the brief time we have been working on this project, some of the addresses

have changed. Links to websites should be regularly checked for accuracy. Also, the update intervals for the data sets should be plainly visible to the user.

4. *Website Manager*
   A website manager is needed to maintain the site and be available to respond to questions or problems.

5. *Additional Comments*
   Java should be used to run programs.
   One user was interested in real data sets, not gif files.

Exciting Polar Information

The survey questions yielded a list of website ideas for future development. Some of these have been developed and the responders were not aware of the sites. This is a common problem.

Some of the suggestions were:

1. Near real-time data for sea ice and snow worldwide.
2. Polar meeting and workshop information with individual names to contact.
3. List of Arctic and Antarctic expeditions in this century.
4. Websites for SHEBA, SCICEX, etc.
5. Polar press releases.
6. Arctic facts and figures – almanac type information.
7. Current research projects and cruises.
8. Job announcements.
9. Upcoming funding opportunities.
10. Data links to agencies where data can be obtained.

Charges for Website Access

The overwhelming response to this question was NO.

Conclusions

This paper has been a survey of polar websites with the intent to discover some new ones. Individually our mission was accomplished and we hope that this discussion has led you to some new sites and web information as well. Lots of books and journal articles are available on the development of websites. The survey pointed out comments by polar colleagues about their concerns for image loading, tables of contents, site updates, and website management. These issues are food for thought for future web developers. Some interesting ideas were also proposed for future topics to be included on websites.

BUILDING AN INTRANET: A COLLABORATIVE EFFORT

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Abstract: This paper describes the introduction of the Internet to a hospital and the concurrent development of their intranet. A timeline, the need for collaboration, and the technique used to persuading senior management to adopt this new technology are described. Finally, the steps being taken at a college library to develop an intranet are shared.

Keywords: Intranets (Computer Networks), Communication in Organizations, Web Sites-Design-Planning, Diffusion of Technology

Introducing an Intranet

Intranet: a sophisticated internal web site that puts information directly into the hands of individual staff members. The development of intranets is creating yet another role for librarians as information managers in our institutions. As an increasing amount of information is made available through these internal Internet sites, the librarian's role may include software trainer, organizer, HTML editor or web manager.

The concept of intranets has grown in popularity over the last few years. High levels of security can be maintained, since web pages are available only to the staff of a company, hospital or corporation. Firewalls, composed of hardware and software, provide password protection against non-authorized individuals. Because hospitals must devote considerable resources to protecting patient information, they are an ideal setting for building an Intranet. An article in the *Investor's Business Daily* on the 14th of May states that intranets are "seriously making people rethink corporate computing". A study of seven companies by International Data Corporation shows that returns average about 1000%, and that these gains are seen within weeks.

The Lutheran Medical Center Experience

We began our journey in April 1995. Our Information Services (IS) department hired a consultant to help determine the hardware and software configurations to be used for the web server and browser. A Unix machine running Linux was chosen for the server and Borderware's firewall package was installed. Netscape was chosen as our browser package and was immediately installed on selected PCs.

The library staff took the lead and developed the first pages for the hospital. The library home page consists of an introduction to services and detailed descriptions of library staff roles. From the home page, services are described and appropriate forms are made available for interlibrary loan, literature searching and book or journal purchase requests. All of this was a learning experience, as none of the staff had formal training in writing for the Web. Creating HTML tables, lists, and forms soon became less mysterious. Additional library web pages give journals held in the library (updated every six months), currently received books (updated monthly) and training classes (updated quarterly).

Concurrently, we considered who should have access to the Internet's World Wide Web. Initially, IS viewed Internet access as an option that few people would use. Managers, researchers and a few others were seen as the limited user group. As such, IS wanted to limit the Netscape installation. When the intranet concept was introduced, the project increased in scope enormously. The combination of both Internet and intranet access was seen as a way to greatly facilitate communication and improve daily operations. It was determined that Netscape would be installed on every PC throughout the corporation by the end of 1996 (approximately 800 machines). This was then moved back to mid-1997.

Hospital staff required training on both e-mail and Internet usage. Beginning in December 1995, library staff taught classes on Internet concepts, how to use Netscape, and how to use the internal e-mail system to send external messages.

Corporate-Wide Initiative

In April 1996, two members of the Intranet Team presented our intranet proposal to senior management. This could not have become a corporate-wide initiative without their support. Instead, it would have remained primarily a library/IS project. The corporation had just released a new "communication culture" document which stated that communication is a shared responsibility, which supports the idea of the intranet. Employees were now charged with actively seeking and using information that the organization made available to them.

Senior management requested a one-page explanation of our proposal and allowed a 20 minute presentation. They were specifically interested in the costs and benefits associated with the Intranet. Five areas were outlined:

1. Objectives of the project:
    - to use electronic media to enhance the corporation's internal and external communication
    - and to provide maximum access to avert a two-tiered communication system
2. A description of how communications would be enhanced
3. Implementation of communication safeguards
4. The phases of the project
5. Projected costs and projected cost savings.

Because we had built a small prototype, we had developed enough expertise to answer questions. We received the approval to implement the full corporate-wide Intranet at that presentation much to our surprise!

We then offered beginning HTML classes for selected individuals who would be our department leads. This increased the number of people who can contribute information to the site. Building an intranet before creating an external web presence has a number of benefits. It establishes the core team (the major skill set group) and increases commitment to develop and maintain content by departments/services throughout the organization. Skills that do not exist internally can be identified and outsourced to appropriate consultants. Projecting costs for the external site is clarified as progress is made on the internal site.

Installation of Netscape department by department began in November 1996. Standards and guidelines for creating and maintaining pages were developed in February 1997. The "Grand Opening" occurred in April 1997 when the LMCweb became accessible in the hospital's cafeteria on two PCs.

Team Development

Defining our target audience to include all employees and medical staff broadened our priorities and pointed to key players in the evolution of the project. Building either an intranet or an Internet site requires having the right team members. Each member brings a set of skills that, in concert, means a successful venture. Several key areas have been identified:

1. Project Management

   This may be the librarian's role - to get buy-in, organize the site pages, coordinate people/departments/services, develop and maintain a budget for the project, and identify needed skills which must be obtained from outside the organization.

2. Graphic Design - may be in-house or outsourced.

3. Technical Expertise

It is extremely beneficial to have a friendly rapport with your IS department because someone with technical and programming expertise is needed to manage the server and write CGI, Perl, and/or Java scripts.

4. HTML Writing/Editing
   Many librarians may feel comfortable in this role - at least for the library pages.

5. Training - on Netscape and HTML
   Librarians can also easily assume this role and will provide enhanced visibility in the institution.

Lessons Learned

1. It became clear that a successful intranet must include information employees continually seek. We began posting internal job openings and working with the Human Resources (HR) and Communications departments to include benefit and current news about our organization.
2. A considerable amount of time was spent during the first year and a half educating management and staff about web technology and the benefits an intranet would bring to the workplace.
3. We chose to try and train others throughout the hospital in HTML skills. We now realize that novice HTML writers will require intensive support. Is it worth it? This is most likely a decision that will depend on your institution and the skills, aptitude, and eagerness of your staff.
4. Site maintenance is a long-term commitment. Part of the LMCweb guidelines address this issue - a department must agree to the maintenance of their pages before the first page is ever presented to the organization.

To the Future or Ongoing Issues

Challenges will be encountered! Our challenge to identify the most appropriate search engine for the site remains unresolved. We want to find one that searches both numbers (for policies and procedures) and text. The Netscape roll-out is ongoing. Keeping it on the priority list for an overworked IS department is an ongoing dialog. Development of an external web site was projected for mid-1997. This will eventually happen, but we are now considering a relationship with an outside vendor and/or affiliated institutions. One thing is certain, there is *nothing static* about an intranet. As graphic design enhancements are made, text may change too, producing a different look and feel for the site. Getting the contributors to realize that it will never be done and never be perfect is an ongoing process.

Now I'll shift gears and address the progress we've made at the Consortium Library in Anchorage.

Where are we at the University of Alaska Anchorage

Unlike many hospitals, academic centers have been using the Internet for many years. It would be a rare opportunity to champion the values of Internets in this environment. However, the benefits of an intranet are not always as easily seen, even for this group of early adopters.

At UAA, the Internet was introduced in stages, beginning in the late 80's. Library staff had full access in 1993. The library has had a local Novell network since 1991 and makes available 45 CD-ROM based databases ranging from ABI/Inform to Medline to Wenger Anthropological Eskimo Database. However, most of these resources are available only when the student or faculty member is actually IN the library. A new library Dean beginning September 28th will likely mean more changes are in store for the library and the library staff.

The need for mounting internal documents, staff-specific material or for-library-eyes-only information began just this past summer. A small committee consisting of the library member of the university-wide Internet committee, two technical support personnel, and the author of this paper met in early summer to discuss the pros, cons, and possible types of material to be included on the library's intranet. Before anything is added permanently to the web server, other library faculty reviews the content.

Developing an intranet will provide a central location for critical information, will make sure that updated versions of essential information were available to all staff, and will increase communication. However, this new use of an old technology will mean staff will have to learn new behaviors, decisions will have to be made concerning the format of documents (e.g., handouts in PDF or HTML or both or other formats), practical considerations of whether we have enough server capacity and will we be able to rely on having specific software (such as MS Office 97) available on every staff machine.

We next discussed what types of information would be appropriate. There are no surprises with our list:

> Handouts, library map, specific "department" pages (such as Computers and Networking), policies and procedures, minutes of meetings, phone list, staffing schedules, vacation schedule, and the reference desk schedule.

To date, 90% of the library handouts have been converted to HTML, the CAN department has updated pages available to the staff and a calendar program has been found which will be tested in hopes it will address the scheduling questions.

I hope this quick overview of how intranets have been developed in two very different organizations will help you realize that we, as librarians, do have a role to play in this new forum of information management. Our role can range from creating library pages to selecting the external links that will appear on various pages, to being a member of the team that organizes the entire site. Working on these projects has been a thrilling and a powerful learning experience.

The following is a list of resources and various tools we have used and found valuable.

Books

- Lemay, Laura. 1996. *Teach Yourself Web Publishing with HTML 3.2 in 14 Days.* Sams.net Publishing, Indianapolis, IN.
- Bernard, Ryan. 1996. *Corporate Intranet: create and manage an internal web for your organization.* John Wiley & Sons, New York.
- Weinman, Lynda. 1996. *Designing Web Graphics: how to prepare images and media for the Web.* New Riders Publishing, Indianapolis, IN.
- Chandler, David M. 1995. *Running a Perfect Web Site.* Que, Indianapolis, IN.

Journals

- *Internet World*, Mecklermedia Corporation
- *Web Week*, Mecklermedia Corporation
- *Ragan's Intranet Report*, Ragan Communications

Listservs

- web4lib@library.berkeley.edu (listserv@library.berkeley.edu)
- adv-html@ua1vm.ua.edu (listserv@ua1vm.ua.edu)

Web sites

- http://www.intranetjournal.com/
  - (The Intranet Journal)
- http://bones.med.ohio-state.edu/eric/papers/primer/webdocs.html
  - (Writing for the Web: a primer for librarians)
- http://sunsite.berkeley.edu/Web4Lib/faq.html
  - (The Library Web Manager's Reference Center)
- http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html
  - (A Beginner's Guide to HTML. The NCSA Beginner's Guide to HTML is the most frequently requested file on NCSA's Web servers).
- http://jimmy.qmced.ac.uk/usr/im94jone/
  - (Corporate Intranets: the last tool of survival for the corporate library? June 1998).

COASTAL DATA & INFORMATION RESOURCE AT THE UNIVERSITY OF RHODE ISLAND

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ABSTRACT: Producers of coastal data and information must look to new ways to distribute their products to potential users. Scientists analyze and summarize raw data and then provide access to the information through published reports while librarians traditionally gather, organize and facilitate in the use of these reports by consumers. However, the Internet and World Wide Web now allow users sitting in a government planner's office, a classroom, or even in a private home, anywhere in the world, to seek and manipulate resources without our hands-on guidance.

The University of Rhode Island, in conjunction with the National Sea Grant Depository and NOAA's Coastal Services Center, is creating a 'digital center' to facilitate electronic access to data and information that is ever more critical for marine and coastal issues, research and management. The project's four key components will be described:

1. Data will be accessed by an internet-based tool, Distributed Ocean Data System (DODS) [http://dods.gso.uri.edu/DODS].
2. The distributed data resource will be populated with data sets.
3. A significant portion of the US National Sea Grant Depository collection will be digitized to provide access to the reports and information products generated by a multi-institutional, US coastal and marine science research program.
4. A coastal web site will be created to provide a point of entry to the distributed data and information system.

POLARWEB - BUILDING AND DEVELOPING OF A WEB SERVICE

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ABSTRACT: This paper is about the Polar Web, which is a guide to Internet resources dealing with the lands and waters surrounding the North Pole and the South Pole, and with other cold regions of the Earth. All subjects' disciplines are covered. The Polar Web is a collaborative project of the Polar Libraries Colloquy. It is managed by the Arctic Centre at the University of Lapland (AC), Rovaniemi, Finland. There seemed to be a need for this kind of service in the Internet and thus this project was started in 1996 at the AC together with William Mills from the Scott Polar Research Institute. Now the service has been in use for the science community about 18 months but the work is not over yet, on the contrary it looks like it has just started. I will deal with the problems of managing and developing the PolarWeb, also take a look at the new web-standards like XML - how them can be helpful or will they make PolarWeb unneeded in the future?

KEYWORDS: world wide web, polar areas, information services

Building of the PolarWeb

The idea for this project was introduced in the 1994 PLC meeting. In 1996 a working group was founded and it was decided that the project will be started at the Arctic Centre, University of Lapland. The work started in 1996 when AC hired a planner, Miss Mari Ekman, for one year to do the work. The Structure for the system was done by Mari Ekman and William Mills from the Scott Polar Research Institute Library. In the homepage there are three main categories:

A. General
B. Geographical Regions and
C. Special Subjects

The A section has six sub-headings:

1. Resources (Libraries and bibliographic databases, data centers and data directories, museums)
2. Organizations (International and national research organizations)
3. Research Projects (Project directories and links to other research projects)
4. Contacts and Communications (Experts, mailing lists, etc.)
5. News (forthcoming meetings, new publications, etc. Link to the Congresses database that is maintained by AC)
6. Electronic Newspapers and Publications

In the sections B and C the links are sorted by geographical region (B) or by subject (C). One site can have links from both B and C-section. Linking sites to the right category was quite difficult because many institutes do multidisciplinary research.

At the bottom of the page there is a possibility to do searches from the local web site at the University of Lapland (PolarWeb pages plus Arctic Centre's web pages). The search engine used is WebGlimpse. It's possible to search other directories indexed with WebGlimpse if the index file can be copied to our local server.

After the structure was created, the search began for the relevant links. It was done by doing keyword searches with common search engines, like AltaVista and Yahoo.

Graphics and layout

The layout is very simple and clear, pictures and graphics are used only in the Polar and Cold Regions Libraries and Archives -pages where there are small maps of the Antarctic and Arctic. There was a background picture for a while (it can be seen at the Organizations page - A 2.) but since we got feedback that it's slowing the downloading it was removed.

Technical problems encountered

In the beginning the main problems we had were with the server of the University of Lapland where the pages are hosted. Due to several reasons the server was way too slow and was down far too many times. Because we are dependent on the university's computer center and it looked like we are not very high on their priority list, it took almost two years to have a simple search engine for the PolarWeb.

THE PRESENT STATUS

Visitors

Now that the pages have been up for about two years people seem to have found the pages. This year there have been 1,000 – 1,600 visits / month, see appendix for more detailed statistics. Of course that's very little compared to many sites but since there are no sexy subjects in the pages, it can be considered as a good start.

Updating and maintaining

One of the biggest jobs is to keep the links active and find new relevant sites. Development in future web-technology will hopefully solve these problems but before that you'll have to go through the links and remove dead ones or replace them with new addresses - if you can find them. We have used trainees from local schools to find new sites and check the existing links.

When the web creates a problem (like dead links), it often gives you tools to cope with it, like for example NetMind's URL-Minder. This service keeps track of Web pages and other resources on the World Wide Web. It sends a notification via email whenever registered resources change (http://www.netmind.com/html/url-minder.html).

Suggestions for new links are coming from institutes and individual persons who would like to have their pages linked. Our staff informs us when they find interesting sites. One way to find links to arctic research and ongoing research projects is to join open mailing lists, like ArcticInfo which is administered by the Arctic Research Consortium of the United States, ARCUS (http://www.arcus.org/). The disadvantage is that your mailbox can be loaded sometimes.

POLAR AND COLD REGIONS LIBRARIES AND ARCHIVES

The web version of the Polar and Cold Regions Libraries and Archives is one essential part of the PolarWeb. It was edited into web format by Eric Tull from the University of Calgary Library. In the beginning the editing was done at the University of Calgary Library. The updated files were automatically sent to Rovaniemi by email and then were manually transferred into our web site. Eventually problems arose when we did some changes here; it happened that we had different versions of the database in our sites. So we agreed that all the editing is done here and gradually we were able to migrate all the pages from the University of Calgary Library to the Arctic Centre.

The information for this directory is taken from two sources:

1. Polar and Cold Regions Library Resources: a Directory (3rd edition). Compiled and edited by Martha Andrews, Ann Brennan, and Liisa Kurppa
2. Keyguide to Information Sources on the Polar and Cold Regions. Written by two staff members of the Scott Polar Research Institute - William Mills and Peter Speak

It's possible to add your information to the directory by filling the form on the web page or by sending email to me: avitikka@urova.fi

FUTURE DEVELOPMENTS IN THE WEB TECHNOLOGY AND POLARWEB

There is interesting development going on in the Web technology, which in the future can help a lot in managing PolarWeb. The two main problems now are to find the relevant sites, among the millions of web pages, and to keep the links operational - it's very frustrating to go through a list of links which are giving as a result the most popular page ever:

File Not Found **The requested URL /hello.htm was not found on this server.**

I deal shortly with two systems that in the future can make the maintaining easier: XML and Dublin Core.

XML

A lot is expected from the XML (Extensible Markup Language) extension to the HTML language. HTML is a format that describes how a Web page should look, and does not represent data. The use of XML will improve Web-browsing applications for viewing, filtering, and manipulating information on the Internet. It should also make electric trade easier.

There are three main elements in XML:

- DTD (Document Type Definition) defines the logical structure of the XML-document; the "grammar" used and allowed tags in the document.
- XSL (Extensible Style Language) defines how the documents should look.
- XLL (Extensible Link Language) (Extensible Link Language) is the most interesting part for the PolarWeb. It is still under development. With XLL, for example, linking could be multidirectional, and links could exist at an object level rather than just at a page level. With XLL it is possible to create indirect links which are based on "link warehouses" where the changed URL's are updated. That would be a great relief, because then the work done now to check the links would not be needed anymore. More reading about XML can be found from addresses: http://www.w3.org/XML/ and http://www.microsoft.com/xml.

Dublin Core

The Dublin Core is a 15-element metadata element set intended to facilitate discovery of electronic resources. The idea is that each html-document has metadata that tells the search engines about their content, for example like this:

date.current: 19980825
title: PolarWeb homepage
creator.name: Vitikka, Arto
creator.email: arto.vitikka@urova.fi
creator.affiliation: Arctic Centre, Univeristy of Lapland
creator.postal: P.O. Box 122, 96101 Rovaniemi
subject.keyword: arctic, antarctic, polar areas, libraries, information service
description: Guide to Internet resources dealing with the lands and waters surrounding the North Pole and the South Pole, and with other cold regions of the Earth. All subjects disciplines are covered from the physical sciences and life sciences, through the social sciences and the native peoples, to the engineering/technology disciplines.
publisher: Arctic Centre and Polar Libraries Colloquy
date.creation:19960410
format: text/html
identifier. url:http://www.urova.fi/home/arktinen/polarweb
language: ENG
coverage: Polar areas

It's essential that the major search engines start to support Dublin Core standard, which they don't do so far. But there are projects, which have engines that use the standard, like Nordic Web Index (http://nwi.ub2.lu.se/). More information about Dublin Core from address: purl.oclc.org/metadata/dublin_core and about Nordic Metadata project from http://linnea.helsinki.fi/meta/

Map interface

One future development could be to build a geographical interface to PolarWeb using clickable maps or Java based applications to access the resources in Polar Regions. One example of this kind of interface in the Internet is BALTICSEAWEB - An information system about the Baltic Sea environment (www.baltic.vtt.fi). In the figure 1 there is a picture of the page. From the map one can select the area of interest by clicking the check box and after that do keyword or free text search to the database.

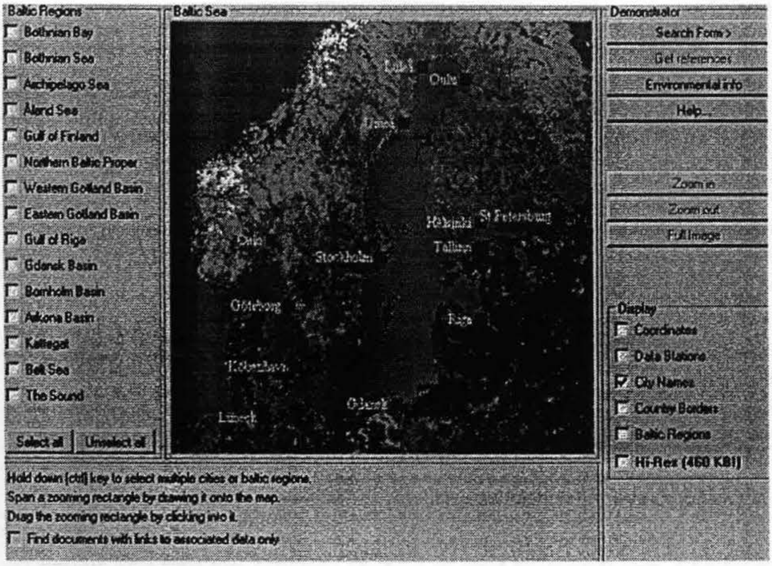

Figure 1. Geographic interface in the Baltic Sea Web, http://www.baltic.vtt.fi.

References

XML; http://www.w3.org/XML/
XML White paper; http://www.microsoft.com/xml
Net-Minder; http://www.netmind.com/html/url-minder.html
http://www.arcus.org/
Nordic Web Index; http://nwi.ub2.lu.se/
Dublin Core; http://purl.oclc.org/metadata/dublin_core
Nordic Metadata project; http://linnea.helsinki.fi/meta/
Baltic Sea Web; http://www.baltic.vtt.fi

Appendix

Number of requests / page / month (pages with 50 or more requests/month)

March 1998

Requests	Page
1969	Homepage
349	Geographical Regions
344	Polar And Cold Regions Libraries And Archives
295	Resources
220	Research Projects
206	Special Subjects
145	Electronic Newspapers and Publications
138	List of libraries in Denmark
134	Organizations
112	Contacts and Communications
95	List of libraries in Canada
85	Polar Libraries Directory
85	Royal Geographical Society
84	Special Subjects, Native Peoples
74	Polar Libraries Colloquy
69	Special Subjects, Biological Sciences
67	Biblioteca Nacional De Chile
65	Public Records Office UK
64	Canada Dept. of Indian Affairs and Northern Development Library
63	Special Subjects, Earth Sciences
59	List of libraries in UK
59	Scottish Record Office
58	List of libraries in Finland
57	National Climatic Data Center / NOAA
56	Metropolitan Toronto Reference Library Special Collections
55	List of libraries in the United States
54	Hudson's Bay Company Archives. Provincial Archives of Manitoba
54	British Library
54	Royal Geographical Society. Library
52	List of libraries in Chile
51	Special Subjects, Other Sciences

July 1998

Requests	Page
1250	Homepage
257	Polar And Cold Regions Libraries And Archives
197	Resources
173	Geographical Regions
118	Electronic Newspapers and Publications
116	Special Subjects
111	National Climatic Data Center / NOAA
103	Organizations
102	Research Projects
87	News
87	List of libraries in the United States
84	Biblioteca Nacional De Chile
82	Special Subjects, Native Peoples
79	Public Records Office UK
77	List of libraries in Canada
75	Contacts and Communications
72	Polar Libraries Colloquy
69	List of libraries in UK
53	Royal Geographical Society. Library

Comments from the audience: We use this in teaching how to find information from the Web.

The layout of the PolarWeb, should we do something for it? If you know sites that should be added to the service, please contact by email.

RESEARCH METADATA ON THE WEB: SELECTED GEOSPATIAL DATA AND METADATA DIRECTORIES

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ABSTRACT: This paper will present an overview of the types of research metadata that are available over the Web. It will include a discussion of the electronic tools which are being used to create metadata online and the directories which are being created at the national, federal, and state levels.

The Value of Metadata

Metadata allow researchers to identify potentially useful data sets collected by others. Gary Waggoner, Biological Research Division, U.S. Geological Survey, states "Metadata refers to data that are used to describe a database (e.g., describing the extent of the data, coverage, scale, what methods were used to collect the data, by whom and when the data was collected, etc.) With valid and complete metadata, someone can learn enough about a database (without communicating with the "owner" of the data) to determine if the data would be of use or interest to them."

Metadata's Multiple Meanings

There are several standards for metadata. The situation is aptly described in the introduction to NOAA's Environmental Services Data Directory: "Environmental data is often stored in vastly different formats. Over the years, there have been many competing standards. These include: the Federal Geographic Data Committee (FGDC) Metadata standard, the paragraph formats used in the NEDRES databases, the Government Information Locator System (GILS), and the Directory Interchange Format (DIF). Each format has different field names and a different look and feel.

These competing standards generally make database searches across multiple databases in multiple formats impossible. However, all of the formats contain certain common fields, including geographic location, title, summary, and data center." ("How Can Users Search the NOAA Environmental Services Data Directory?" NOAA Environmental Data Directory Overview. URL: http://www.esdim.noaa.gov/NOAA-Catalog/Overview.html Updated on December 5, 1996)

GEOSPATIAL METADATA

Geospatial metadata refers to geographically-referenced data sets that are used in geographic information systems (GIS). In the U.S., the impetus for establishing standards and directories for this type of metadata came from the federal government. Many agencies, e.g., U.S. Geological Survey, Environmental Protection Agency, U.S. Department of Agriculture, share a common base of spatial data needs upon which their unique projects are overlaid. The federal government mandated the development of metadata standards and directories to reduce the costly duplication of geospatial data collection. The Federal Geographic Data Committee (FGDC) was established through the Office of Management and Budget (OMB) Circular A-16 "...to promote the coordinated development, use, sharing, and dissemination of surveying, mapping, and related spatial data..." Major responsibilities of FGDC were developing a national database of spatial data, developing and implementing data standards, promoting technology developments, and promoting interagency cooperation in spatial data activities. The FGDC was also charged with promoting cooperation among federal, state, and local agencies and the private sector in spatial data collection, production and sharing.

Products resulting from the FGDC include:

Federal Geographic Data Committee Homepage
http://www.fgdc.gov/index.html

Content Standard for Digital Geospatial Metadata
http://www.fgdc.gov/Metadata/ContStan.html

Geospatial Data Clearinghouse
http://www.fgdc.gov/Clearinghouse/Clearinghouse.html

The Geospatial Data Clearinghouse is a collection of over 50 spatial data servers, primarily in North America, that have digital geographic data primarily for use in Geographic Information Systems (GIS) image processing systems, or other modeling software. These data collections can be searched through a single interface based on their descriptions or "metadata."

With mixed results, the efforts of the Federal Geographic Data Committee have been adopted and/or modified by federal, state, and international organizations.

SELECTED U.S. FEDERAL GEOSPATIAL SITES

Environmental Protection Agency sites:

EPA Scientific Metadata Standards Project
http://www.lbl.gov/~olken/epa.html

EPA Spatial Data Library System (ESDLS)
http://www.epa.gov/enviro/html/esdls/esdls_over.html

Data sets are contained in ESDLS for county, state, and national levels. These data are available at a scale of 1:100,000 (county), 1:250,000 (state), and 1:2,000,000 (state and national). The geographic extent for ESDLS data covers the conterminous United States, Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

EPA Databases and Software
http://www.epa.gov/epahome/Data.html

Overview of the facets of EPA's data sites, metadata tools, etc.

EPA's EMAP site (Environmental Monitoring and Assessment Program)
http://www.epa.gov/emap/

This site contains data, metadata, and information about the program.

EPA Geospatial Data Clearinghouse
http://nsdi.epa.gov/nsdi/

The metadata in this clearinghouse provide the spatial data used by Maps On Demand.

GILS (Government Information Locator System)
http://www.access.gpo.gov/su_docs/gils/gils.html

The Government Information Locator Service (GILS) is a networked-based approach to assist users in locating government information resources. The U.S. Federal implementation of GILS began in December 1994. Records are searchable through the GPO Access site listed above.

National Environmental Data Index
http://www.nedi.gov/

NEDI currently provides Full-text Search of the environmental information compiled by several agencies of the federal government including Agriculture; Commerce; NOAA; National Institute of Standards and Technology; Census; Patent and Trademark Office; Defense; Master Environmental Library: Air Force Combat Climatology Center (AFCCC), Air Force Global Weather Center (AFGWC), Center for Air/Sea Technology, Stennis Space Center (CAST, SSC), Coastal and Hydraulics Laboratory (CHL), National Geophysical Data Center (NGDC), Naval Research Laboratory (NRL), Simulator Data Base Facility (SDBF), National Imagery and Mapping Agency (NIMA); Defense Environmental Network and Information Exchange (DENIX); Energy; Interior; USGS including the Biological Resources Division; Health and Human Services; EPA; NASA, National Science Foundation; and Library of Congress (text of bills).

National Aeronautic and Space Administration (NOAA) sites:

Global Change Master Directory
http://gcmd.gsfc.nasa.gov/

NASA's Global Change Master Directory (GCMD) is a comprehensive directory of descriptions of data sets of relevance to global change research. The GCMD database includes descriptions of data sets covering climate change, the biosphere, hydrosphere & oceans, geology, geography, and human dimensions of global change.

Earth Observing System Data and Information System
http://spsosun.gsfc.nasa.gov/New_EOSDIS.html

Earth Observing System (EOS) Data and Information System (EOSDIS) is a comprehensive data and information system developed by NASA under the Earth Science Enterprise (ESE) Program.

NOAA Central Library Historical Data Sets
http://www.esdim.noaa.gov

NOAA Coastal Services Center
http://www.csc.noaa.gov/

NOAA Environmental Services Data Directory
http://www.esdim.noaa.gov/NOAA-Catalog/index.html

From this directory, you can choose to search any or all of the data sets from the National Data Centers, other NOAA sites, and the two non-NOAA sites listed below:

NOAA National Climatic Data Center
NOAA National Geophysical Data Center
NOAA National Oceanographic Data Center
NOAA National Snow and Ice Data Center

NOAA National Marine Fisheries Service
Historical Data Sets from Central NOAA Libraries
Historical DATA Sets from NCDC Libraries
All other NOAA Sites

NOAA US-Japan GOIN (Global Observing and Information Network) Node
National Environmental Data Referral Service

U.S. Geological Survey sites:

USGS Geospatial Data Clearinghouse
http://water.usgs.gov/nsdi/

U.S. Geological Survey Geoscience data
http://geo-nsdi.er.usgs.gov/

U.S. Geological Survey Mapping & Remotely Sensed Data
http://mapping.usgs.gov/nsdi/

Includes links to the National Atlas of the United States (http://www-atlas.usgs.gov/atlasvue.html)

U.S. Geological Survey Water Resources Spatial Data
http://water.usgs.gov/public/GIS/

U.S. Geological Survey EROS Data Center
http://edcwww.cr.usgs.gov/dsprod/prod.html

Earth Resources Observation Systems (EROS) Data Center, or the EDC houses millions of aerial photographs of the United States, as well as images from several series of satellites covering the entire Earth. EDC also is host to the sales data base for digital products and maps of the USGS's National Mapping Division, of which it is part. Specific products can be searched through the Global Land Information System (GLIS) (see "Specific USGS projects" below)

The **Biological Research Division**, U.S. Geological Survey created its own metadata standards because taxonomic data, collection data, and other biological information that were not implicitly geospatial were not adequately addressed by the FGDC. Metadata tools created as part of the National Biological Information Infrastructure include:

NBII Metamaker Version 2.1 template for entering metadata
(http://www.emtc.nbs.gov/http_data/emtc_spatial/applications/nbiimker.html),

NBII Metadata Clearinghouse
(http://www.emtc.usgs.gov/http_data/meta_isite/nbiigateway.html),

Integrated Taxonomic System (IT IS) for biological nomenclature
(http://www.it is.usda.gov/it is/)

Taxonomic Resources and Expertise Directory
(http://www.nbii.gov/tred/)

Specific USGS projects:

Global Land Information System (GLIS)
http://edcwww.cr.usgs.gov/glis/glis.html

The Global Land Information System (GLIS) is an interactive computer system developed by the U.S. Geological Survey (USGS) for scientists seeking sources of information about the Earth's land surfaces. Metadata descriptions are included for digital cartographic data, digital climate data, digital geologic data, digital hydrologic data, digital landuse/landover data, digital satellite and aerial data, digital soil data, photographs, and printed maps.

Arctic Environmental Data Directory
http://www-ak.wr.usgs.gov/aedd/aedd.html

The U.S. Geological Survey maintains the Arctic Environmental Data Directory (AEDD) in Anchorage, Alaska, on behalf of the member agencies of the Interagency Arctic Research Policy Committee (IARPC). The IARPC includes the National Science Foundation, the Departments of Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation, the Environmental Protection Agency, the National Aeronautics and Space
Administration, the Smithsonian Institution, the Office of Management and Budget, and the Office of Science and Technology Policy. It contains descriptions of data on global change studies, environmental interactions, earth sciences, social sciences, and policy and management. Contact information is provided in each entry to obtain the data.

INTERNATIONAL METADATA SITES

African Data Dissemination Service
http://edcintl.cr.usgs.gov/adds/adds.html

Supported by US AID, this site allows you to download and view data for the African continent as a whole, regions of Africa, and individual countries in Africa.
Data are predominantly geospatial, but agriculturally related data sets for crop production, rainfall, etc. are also available.

Antarctic Master Directory (AMD)
http://scar.org/subsidiary/jcadm/amd/

The Global Change Master Directory (GCMD) group is working closely with the AMD. This site will be a directory for all Antarctic data sets and the GCMD will also receive copies of their descriptions in the Directory Interchange Format (DIF).

Biodiversity Conservation Information System (BCIS) Metadatabase
http://www.biodiversity.org/metadatabase.html

In September 1997 the World Conservation Monitoring Centre (WCMC), based in Cambridge, UK, was commissioned by the BCIS consortium to develop a metadatabase for the consortium members. The BCIS is linked to the home page of the Clearing-House Mechanism (CHM) of the Convention on Biological Diversity (CBD) http://www.biodiv.org/chm.html, which currently contains full text articles and discussions, related to key thematic areas of interest to the CBD. A searchable URL Database on Scientific and Technical Cooperation in Biodiversity is available at http://www.biodiv.org/chm.html

Canadian Geospatial Data Infrastructure
http://cgdi.gc.ca/

The Canadian Geospatial Data Infrastructure (CGDI) is an initiative by the Inter-Agency Committee on Geomatics (IACG) and the Canadian Council on Geomatics (CCOG) to assemble the many governmental and commercial interests related to the production, application and dissemination of geospatial information. Related to this site are the National Atlas of Canada (http://www-nais.ccm.emr.ca/english/home-english.html) which provides base and thematic maps online, and an interactive map maker (http://www-nais.CCRS.NRCan.GC.CA/schoolnet/issuemap/Home.html).

ERIN (Australian Environmental Resources Information Network)
http://www.erin.gov.au/database/db.html

Maintained by the Department of the Environment, this site provides public access to Data Directories, Environmental Regions, Biological Data, Map Facilities, and Textual / Bibliographic Databases.

The European Catalogue of Data Sources (CDS)
(http://www.mu.niedersachsen.de/system/cds/) was established in order to provide a locator system on environmental information in Europe and to support the operation of the European Environment Agency - Environmental Information and Observation Network (EEA-EIONET). It supplies information on who has what information in Europe, in which form and where the data exist as well as how to get access to them. CDS provides metainformation to the users of environmental information and data.

Meta-information is organized in two categories: addresses and data sources. Addresses are hierarchically structured into organizations and persons. Data sources are assigned to six classes. Index terms are taken from the General European Multilingual Environmental Thesaurus (GEMET) (http://www.eea.dk/Locate/GEMET/default.htm)

Consortium for International Earth Science Information Network (CIESIN)
http://www.gateway.ciesin.org/gils/

"The CIESIN GILS Access System is a prototype catalog service providing access to records that describe key information resources and data access systems associated with the Consortium for International Earth Science Information Network (CIESIN) and CIESIN's Information Cooperative partner organizations. Metadata records are structured according to GILS (Application Profile Version 2.0) content standard and are searched and retrieved by one or more user-selected metadata attributes. Metadata records are retrieved and displayed using familiar GILS attribute names."

Socioeconomic Data and Applications Center (SEDAC)
(http://wwwgateway.ciesin.org/cgi-bin/zgate) is a node of the CIESIN Information Network. Data available through SEDAC is focused in the following categories: population dynamics; social and political structures and institutions; human and environmental health; economic activity; human attitudes, preferences, and behavior; land use; agriculture; and industry.

CEOS Information Locator Service (CILS), Committee on Earth Observation Satellites (CEOS)
http://cils.dlr.de/what.pl/EOEData

CEOS, the Committee on Earth Observation Satellites, was created in 1984 upon the initiative of the Economic Summit of Industrialized Nations. In 1995 the need for an electronic information service for remote sensing earth observation data was recognized. DARA (the German space agency) was asked to initiate a demonstration pilot of the CEOS Information Locator System (CILS) which was to be closely related to already existing CEOS information systems and to major European developments in information sharing. Special consideration was to be given to the needs and capabilities of developing countries.

Environment Data Directory (EDD), Australia
http://www.environment.gov.au/net/edd.html

"Australia's Environment Data Directory stores information about data within the Commonwealth Department of the Environment, Sport and Territories. It includes a controlled facility for on-line populating of metadata records. It also supports spatial and temporal searching using a metadata guideline called ANZLIC (Australia, New Zealand Land Information Council). ANZLIC is quite similar to the metadata standard of the U.S. Federal Geographic Data Committee (FGDC), which is fully aligned with GILS."

GDDD - Geographical Data Description Directory, MEGRIN
http://www.megrin.org/gddd/gddd.html

MEGRIN is an organization representing and owned by 19 National Mapping Agencies (NMAs) which aims to meet the needs of the pan-European digital map data market. It is an initiative of CERCO, the forum for heads of European NMAs.
MEGRIN's GDDD has datasets from more than 36 National Mapping Agencies (NMAs).

Global Environmental Information Locator Service (GELOS)
http://ceo.gelos.org/

GELOS is part of the G7 Environment and Natural Resource Management project (G7-ENRM). Its main objective is to create a global virtual distributed library of ENRM data and resources. While data is to be included, as of 31 July 1998, the resource types indexed included: company profile, document, database system, on-line service, and project/program. The European Catalogue of Data Sources (CDS) is part of the GELOS project. A complete description of CDS is given above.

Global Information Locator Service
http://www.gils.net/

The Global Information Locator System was modeled on Government Information Locator Service. Information providers can describe anything with a Global Information Locator Service record--books, people, meetings, artifacts, rocks, etc. The referenced resource is often not available on networks, nor even electronic. For information that is online, the record can include "hyperlinks" for network access to the resource described or related resources. There is no central interface for this project, as it is a machine-level search interface. Of interest are the implementers of GILS found at http://www.gils.net/implement.html including the Nordic Web Index http://nwi.bok.hi.is/index_e.html

Green Pages-Environmental Data Directory, Australia
http://www.environment.gov.au/edd/owa/edd_search2.category_list
This Web page allows you to search by categories, e.g., Boundaries, Climate and Weather, Ecology, Fauna, Flora, Forests, Geosciences, Human Environment, etc. The top page http://www.environment.gov.au/database/edd/ allows basic or advanced searching.

Instituto Nacional de Estadistica Geografia e Informatica (INEGI), Mexico
http://ags.inegi.gob.mx/

Mexico's National Statistics, Geography and Informatics Institute (INEGI) is in charge of generating, incorporating, processing and publishing information on the country's physical environment, geographical features and natural resources, and on its population and productive activities. This site contains statistical data sets and basic thematic maps.

JAPAN GIS/MAPPING SCIENCES RESOURCE GUIDE
http://www.cast.uark.edu/jpgis/

The Guide is designed to serve as an introduction to the world of Japanese GIS, remote sensing, geospatial data products, maps, activities and information sources. It serves primarily to help English-speaking geographic information systems and remote sensing specialists, engineers, geographers, cartographers, geologists, production managers, computer and data processing professionals, and marketing and sales executives.

International Arctic Environmental Data Directory (ADD), Arendal, Norway
http://www.grida.no/prog/polar/add/add_new.htm

ADD is a membership organization where countries with major Arctic data holdings are represented. Members also include international circum-Arctic organizations with data directories. Member countries include:
Canada, Denmark, Finland, Germany, Greenland, Iceland, Norway, Russia, Sweden, UK, and USA This directory covers information sources and some data, e.g., NERC Arctic Environmental Metadata Centre compiled by the Scott Polar Research Institute.

Southern African Metadata
http://www.gims.com/metadata/

A consortium of companies and the government is responsible for this site. At present, the geospatial metadata is that of the CSIR Division of Water, Environment and Forestry Technology (Environmentek). This Division is the largest source of multi-disciplinary competencies in South Africa in the field of natural resource and environmental management. Positioned at the forefront of environmental policy development, integrated environmental management (IEM) and natural resource management, it provides innovative solutions for environmentally sustainable development to industry, government and local and rural communities through contract research, consultation and technology transfer. The Division has a spatial technology group of about 25 people covering the following areas of expertise: Geographical information system applications, Remote sensing applications, 3D visualization and virtual reality technologies, and Decision support systems.

United Nations Environmental Programme (UNEP)
Global Resources Information Database
http://grid2.cr.usgs.gov/

United Nations Environmental Programme (UNEP) Global Resources Information Database (GRID) Meta-Data Directory.
http://www.grid.unep.ch/mdd/home.htm

This directory primarily houses dataset descriptions from developing countries. They also use the Directory Interchange Format (DIF) "standard". The Directory itself is downloadable for PCs (GCMD helped write the software). The intent was that many nations do not have Internet access, so a PC-version of the directory was made for those folks to search metadata and to write descriptions of their metadata.

The Caribbean Environment Programme
http://www.cep.unep.org/

This site has a searchable directory of metadata and an interactive GIS system.

Commercial Sites:

Data Hound
http://nt1.esri.com/scripts/production/esri/marketing/datahound/main.cfm

An ESRI service that catalogs and searches Web sites that offer freely downloadable data compatible with ESRI software.

Use of Metadata Directories

The creation of metadata records is labor intensive. While the use of online directories can be measured, the actual value to researchers is hard to assess.

Many Web sites have automatic counters that indicate the total number of times the site has been accessed. Other site administrators have tried to present a more detailed analysis of usage. In the present study, statistics of the Global Change Master Directory and the NBII Metadata Clearinghouse were reviewed.

The statistics discussed below often offer a very distorted view of actual use. In discussions with Gene Major, task leader for the Global Change Master Directory, it was pointed out that when a page is accessed, all associated images, e.g., jpegs,gifs on that page also receive a "request," or hit. Therefore, the raw figures presented in the statistics may be greatly inflated. There seems to be a great deal of discussion in the geospatial metadata world concerning users vs. uses, a debate that has been raging for years in the library/information world.

The Global Change Master Directory statistics
http://gcmd.nasa.gov/announcements/wwwstats.html
include: Monthly report, Weekly report, Daily summary, Hourly summary, Domain report, Directory tree report plus a summary report (Figure 1)of usage.

Figure 1: Summary report of statistics for date of record specified

```
Server: http://gcmd.gsfc.nasa.gov/ (NCSA Common)
Local date: Wed Aug 26 11:18:45 AM EDT 1998
Covers: 08/01/98 to 08/26/98 (26 days).
All dates are in local time.

Requests last 7 days: 56742
New unique hosts last 7 days: 3089
Total unique hosts: 11332
Number of HTML requests: 26731
Number of script requests: 62701
Number of non-HTML requests: 85888
Number of malformed requests (all dates): 15847
Total number of all requests/errors: 191167
Average requests/hour: 312.7, requests/day: 7505.8
Running time: 1 minute, 38 seconds.
```

For the 26 day period of August 1-August 26, 1998, there were a total of 191,167 requests, or an average of 7353 requests/day.

The domain statistics also offer some interesting insights. Only those domains with 1,000 accesses or more are shown in Figure 2. A complete listing is available at the Web site.

Figure 2. Global Change Master Directory HTTP Server Domain Statistics

```
Covers: 08/01/98 to 08/26/98 (26 days). All dates are in local time.
1 level, sorted by number of requests, 93 unique domains.

# reqs : # uniq : Last Access (M/D/Y) : Domain
--------------------------------------------

52479 : 522 : 08/26/98 : US Government (.gov)
26868 : 2628 : 08/26/98 : US Commercial (.com)
22375 : 2307 : 08/26/98 : (numerical domains)
19457 : 2333 : 08/26/98 : Network (.net)
13188 : 876 : 08/26/98 : US Educational (.edu)
10803 : 175 : 08/26/98 : United Kingdom (.uk)
3911 : 260 : 08/26/98 : Australia (.au)
3783 : 180 : 08/26/98 : Japan (.jp)
2606 : 274 : 08/26/98 : Germany (.de)
1965 : 17 : 08/26/98 : Hungary (.hu)
1594 : 185 : 08/26/98 : Canada (.ca)
1340 : 101 : 08/26/98 : United States (.us)
1328 : 86 : 08/26/98 : Netherlands (.nl)
1112 : 100 : 08/26/98 : Non-Profit (.org)
```

From the domain statistics, one can determine that the heaviest users are U.S. governmental, U.S. commercial, undifferentiated numeric domains, networks, U.S. educational. Computers from more than 80 countries accessed this site.

The Server Tree Report (Figure 3) gives the number times a particular directory/file was accessed.

Figure 3. Global Change Master Directory HTTP Server Tree Report (Subset of Total Report)

Covers: 08/01/98 to 08/26/98 (26 days). All dates are in local time.

# of Requests : Last Access (M/D/Y) : Dir/File

# of Requests	Last Access	Dir/File
2018 :	08/26/98 :	FAQS [Frequently Asked Questions]
30 :	08/26/98 :	about.html
52 :	08/25/98 :	climdata.html
268 :	08/26/98 :	co2rise.jpg
24 :	08/25/98 :	elnino.html
20 :	08/24/98 :	entp2090.gif
170 :	08/26/98 :	faqpage.html
471 :	08/26/98 :	gcmd_icon.gif
230 :	08/26/98 :	globwarm.html

While a thorough analysis of the Server Tree Report is not the intent of this paper, it is interesting to note the types of information, which can be gleaned.
As an example, this Directory offers four types of searching interfaces: Guided Interface, Free-Text Interface, and two experimental interfaces: Science Keyword Interface, and Query Preview Interface. By associating appropriate URL file extensions with the tree report, one can compare interface use.

The top page, which displays all four interfaces, is at
http://gcmd.nasa.gov/search/interfaces.html
This top page was accessed 1124; 08/26/98 was the last access date.

To some extent individual interface use can also be studied:

# of Requests : Last Access (M/D/Y) : Dir/File

629 : 08/26/98 : mainquery.html is the Guided Interface
2374 : 08/26/98 : zgate includes but is not limited to the Free-Text Interface. I have been unable to distinguish the free-text interface portion.
3647 : 08/26/98 : param_search is the experimental Science Keyword Interface

Beneath the param_search entry are the statistics on science keyword searches:

20 : 08/25/98 : OCEANS.html
37 : 08/26/98 : OCEANS_BATHYMETRY.html
40 : 08/26/98 : OCEANS_COASTAL_PROCESSES.html
34 : 08/26/98 : OCEANS_MARINE_GEOPHYSICS.html
33 : 08/26/98 : OCEANS_MARINE_SEDIMENTS.html
33 : 08/26/98 : OCEANS_OCEAN_ACOUSTICS.html
37 : 08/26/98 : OCEANS_OCEAN_CHEMISTRY.html
37 : 08/26/98 : OCEANS_OCEAN_CIRCULATION.html
33 : 08/26/98 : OCEANS_OCEAN_PRESSURE.html
37 : 08/26/98 : OCEANS_OCEAN_TEMPERATURE.html
33 : 08/26/98 : OCEANS_OCEAN_WATER_BUDGET.html
35 : 08/26/98 : OCEANS_OCEAN_WAVES.html
35 : 08/26/98 : OCEANS_OCEAN_WINDS.html
35 : 08/26/98 : OCEANS_SALINITY_DENSITY.html
35 : 08/26/98 : OCEANS_SEA_ICE.html
34 : 08/26/98 : OCEANS_TIDES.html
1 : 08/07/98 : OCEANS_VAL.html

187 : 08/26/98 : ~hcil/ index.html is the experimental Query Preview Interface

It is not possible to examine the queries used in free text searching from the data on the Web; however, Gene Major, GCMD, was able to supply a portion of the July 1998 access log for the system. Words searched included: water, temperature, global, rainfall, ozone, SST, sea, daily, daily and weather, space, dry, carbon, avhrr, Langley, global and ocean, snow, satellite, etc.

Of importance to GCMD is the growth of the records in the directory. From an initial catalog of 2000 records, or DIF's, in August 1993, as of June 1998, there were more than 6000 records.

The NBII Metadata Clearinghouse Gateway has just recently begun to keep data on site use. Monthly Summary Statistic Files for the NBII Metadata Clearinghouse Database can be found at
http://www.emtc.usgs.gov/http_data/meta_isite/isite_stats_summary/

At the present time, data are available for the previous month and consists of domain use and unique search terms used.

Figure 4 Sample of the domain listings from NBII Clearinghouse Database

Summary Statistics For the NBII Metadata Clearinghouse Database
Date:08011998
Number Of Searches By Host For Previous Month [July 1998]
Format: Number Of Searches - By Host

1 128.163.81.192
1 129.71.57.63
1 131.187.131.190
1 132.210.173.7
22 140.90.236.88
2 141.117.7.179
1 fenwood-ip.fenwood.co.uk
1 host131-084.ghpl.lib.oh.us
1 infon282.jet.es
1 jc-39.connect.more.net

Using GCMD domain formats for analysis gives the following view of usage:

NBII Metadata Clearinghouse Directory use in July 1998 by domain

# reqs	Domain
621	U.S. Government (.gov)
115	Numeric domains
10	Network (.net)
9	U.S. Commercial (.com)
4	U.S. Military (.mil)
4	Canada (.ca)
3	U.S. Educational (.edu)
3	Spain (.es)
2	Italy (.it)
2	Australia (.au)
1	Finland (.fi)
1	Russian Federation (.ru)
1	United Kingdom (.uk)
1	United States (.us)

Also available from this site is an analysis of the unique search terms used. A sample of the terms is given in Figure 5.

Figure 5. Unique Search Terms Used in NBII Metadata Clearinghouse, July 1998

Format: Number Of Times Used - Unique Search Term

1 " disease"
1 ""catch and release""
1 "'Air quality'"
1 "'Climate"
1 "'Climatic zones'"
1 "'Environmental policy'"
1 "'Global warming'"
1 "'Heating Degree Days'"
1 "'Marine pollution'"
1 "'Meteorology'"
1 "'Public health"
2 "49 48 -122 -123"
1 "49.38 45.56 -96.18 -104.43"
1 "49.39 45.15 -116.53 -125.15"
3 "49.61 43.75 -103.44 -116.66"
2 "49.76 43.11 -89.11 -97.62"
1 "Americanism: menace to the World"
2 "ArcView"
1 "Architectual Acoustics Industrial Noise Control"
1 "Atlantic Forest"
1 "Tae kwon-do green belt to red belt"
1 "Divine Comedy"

The range of unique search terms offers some interesting views of the use of metadata directories. First, many of these directories are Z39.50 compatible which means searches started in remote sites could possibly find their way into the NBII Metadata Clearinghouse. Second, it is equally likely that users of the Web don't really understand the contents of metadata directories. Both situations would lead to futile searches and retrievals.

Conclusions

The evolution of metadata for data sets and their directories offers fertile ground for researchers. Never before have major global initiatives existed to identify data sets; however, as with any neoinformation format, a plethora of problems exist. These include multiple definitions of metadata, researcher hesitancy to complete metadata, competing metadata formats, a profusion of metadata directories with overlapping coverage, and a lack of understanding for both producers and users of how this metainformation will be used.

Nonetheless, it is the author's opinion that the potential rewards offered by metadata for identifying and integrating data sets into research endeavors will inextricably change the way scientific research is conducted. The results are that each study will more fully integrate preceding data leading to a more precise understanding of the world.

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SOME THOUGHTS ON SELECTING LAN BASED CD-ROM SHARING DEVICES

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ABSTRACT: More and more information is available only on CD-ROM, and this has been a mixed blessing. While the CD-ROMs take less space than the books and journals they displace, we are left the question of how to make the disks available to library patrons. Some systems work better in some environments than others. Some systems will succumb to built-in obsolescence. How should you prepare for shared online CD-ROM access? What works, what will keep working, what will have the lowest implementation and maintenance costs? Should we purchase s system or build one ourselves?

Introduction

Whether we like it or not, more and more of our information resources are being delivered on disks. Some material isn't available in any other form – large databases and multi-media learning tools come to mind. Even with materials that are available in print, CDs are sometimes cheaper.

When I worked for a medical research company, we found the PDR was cheaper on-line than in print. That is, if we shared the PDR over a network. Really, the network approach has many advantages – clients can't lose what they can't touch. Clients can't deface – or steal - what they can't touch either. It's easy to make sure all your clients are looking at the latest version of important resources. Still, some materials are also available on the internet at competitive prices - and someone else has most of the hassles in maintaining the availability of the material.

However, moving to on-line CD-ROM sharing can be scary. Luckily, the hardware and software tools have been improving for a number of years. Even better, the prices have been dropping to the point that if you have the computers needed to access the on-line CD-ROMs, the cost of sharing them may not be prohibitive.

Some considerations....

Before we start looking at possible solutions, we need to look at our environment, our needs, our hopes, and our expectations. If we don't have a handle on where we are and where we are going, we're primed to spend a lot of money and wind up disappointed.

The first consideration is the operating system environment – what client operating systems and network operating systems you are using. Some of the more common client operating system environments include Apple Macintosh, IBM OS/2, Microsoft DOS, Microsoft Windows 95/98/NT, and various Unix flavors. Network operating system environments include Apple networking, IBM OS/2 networking, Microsoft Windows Networking, Novell NetWare networking, and various flavors of Unix. Some of these platforms are more widely supported than others.

Each of these platforms has its own needs and requirements. Check vendor literature to see what products are compatible with your environment, and then look for on-line and professional organization feedback on your products. The easiest way to be compatible with the operating systems is to use them to share CD-ROMs. Both Apple and Windows 95/95/NT clients have provisions to share CD-ROMs among one themselves, but this usually means much management hassles if you distribute the CDs too far and wide. Worse, you've made the disks physically accessible to the clients.

Most of the network operating systems can share CD-ROMs with any of their clients. However, again, once you get past seven or so CD-ROMs on-line, management and performance issues can cause problems.

The next big consideration is the number of users you'll need to support. That's simultaneous users, not total users. The number of users and their usage patterns can give you an idea of how much performance you'll need to make everyone happy.

Closely related to this is the network topology you'll be using. If most of your users are connecting via modem, pretty much anything will do – their bottleneck is their modem, not your server. However, for local users regular Ethernet may be inadequate. I've seen several multi-media applications that let a single PC saturate a regular Ethernet-based network. Fast Ethernet is a reasonably priced upgrade for many systems, although in most cases it's only around 3x faster than a well-tuned Ethernet network. Further performance improvements can be obtained by using switches to provide virtual private connections between the clients and the servers. Again, caution is suggested – in single server applications, switches don't help much, and some switches are lots better than others. Token Ring networks can also benefit from switches. I suggest against FDDI or ATM to the desktop due to the per-node costs, but Gigabit Ethernet is coming and could help move the bottlenecks further from the users.

The number of disks you want to have on-line is another major consideration. Using your existing server is fine for up to around 7 disks, small dedicated servers can get up to 50 or so, and then you will need more sophisticated products.

As the number of disks on-line goes up, it's good to remember what a businessman friend calls the 80/20 rule – about 80% of a companies business comes from about 20% of its customers. Sometimes it's the 90/10 rule. In libraries, some books get checked out more often than others. And that brings us to changers. Some people hate CD changers.

They're slow. They're mechanical and failure prone. They're expensive. However, if you know which disks are infrequently accessed you can migrate them to changers, so the speed issue isn't that important. Moreover, many commercial servers will cache the disks, so the speed can be better than that of an actual CD-ROM drive. While they are more likely to break than any individual CD-ROM drive, they're not as likely to break as a farm of drives. Further, most jukeboxes have multiple drives inside them and can work around dead drives. In the end, jukeboxes and changers aren't as expensive as a similar number of dedicated CD-ROM drives. So, if you have many CDs to share, take a good look at changers. If you are considering changers, look at the management software offered by the vendor. Good management software will let you observe CD usage patterns, which will give you the information you need to migrate CDs to and from changers.

The changer discussion usually ignores the observation that the speed of the drive is usually not a real bottleneck. Many multi-media applications ran quite nicely with a dedicated 4x CD-ROM drive. However, the same multi-media applications don't always run well using a networked 24 or 32x drive. It's hard to believe that the drive is the bottleneck when the slower drive was adequate and the faster one was not. Put another way, don't spend too much time or money worrying about the speed of networked drives.

Another item is the types of CDs you need to make available. There are a number of different CD-ROM formats in use. Check the format of the CDs you are using – the vendor can help you if the product documentation doesn't have this information - and then check with your CD-ROM server vendor. Also, DVD is coming. That's great as it offers much greater storage, and a number of CD vendors want to switch as soon as possible. When the full DVD implementation is in place, they will hold as much as 15 times as much as today's CD-ROMs. However, not all CD-ROM server products are created equal here. You might save a lot of money today only to find that you can't upgrade your CD-ROM server to handle DVD CD-ROMs, forcing you into an expensive equipment replacement. Ask before you buy.

When you can grant access to software or data from a network, more items are raised. Was that disk supposed to be networked? And if so, how can you guarantee that you don't have more users than you are licensed for? This is the start of management software. Another key issue for management software is checking how often each disk is used, so infrequently accessed disks can be moved to changers.

How many disks are you going to share? All servers are limited as to how many disks they can share. If the number is large, then the importance of management software increases.

As the number of disks increases, changers look more and more attractive. A changer can make 5 or 6 disks available in the same amount of server drive bay space as a single disk. A changer is cheaper than the equivalent number of single disk players. In the case of larger libraries, changers or jukeboxes with 100, 200, or more disks are available, along with the software needed to manage them.

Some Mundane Concerns....

Everything that is made will become unmade. However you obtain services, your server will break and need to be repaired. Maintenance should be a major consideration in your purchase decision.

Who will maintain the equipment? In-house might make sense if the servers were built in house. But that puts you at the mercy of turnover and other sad problems. And in any case, what else could your staff be doing for you? Is building and repairing servers the best use for their skills?

If you can out-source maintenance, make sure your vendor is trustworthy. Is the vendor close enough to be able to help you? Are the staff trained and certified?

The final question is budget – what can you afford?

Product specific considerations...

Do it yourself, version one - just copy the CDs to a server and run them from the image on the server. This is cheap, if you have the disk space. However, this may violate your license agreement with some vendors. Another caveat - some CDs won't share well this way, although flagging files as read-only and creating mappings, or shares, to the root of the CD-ROM image, can often help.

Do it yourself, version 2 - buy a tower full of drives and a SCSI card and add it to your existing network server. This is still pretty cheap, and has the advantage that you aren't leaving your network operating system. However, this can cause performance problems as the load increases.

Do it yourself, version 3 - buy a tower full of drives and add an AXIS controller. Good performance, cheap, not a bad solution for smaller shops.

Cheap servers – these tend to be based on the Axis controller, and are largely a way to avoid assembling them in-house. For what they are, they are fine. They offer good performance, they support NT, NetWare, NFS, and web access. However, they have no real management software and the last time I checked, they were limited to 10baseT Ethernet.

Low-end servers – the answer to the Axis server from a number of companies – Meridian, Ornetix, ProCom, MicroTest, SCSI-Express, and SCI-Net all have low end products that are quite good and quite affordable. Often the management software is limited, but for a smaller number of disks, that's OK.

High-end solutions. The sky's the limit! Meridian, ProCom, MicroTest, SCSI-Express, and SCI-Net all have large systems that can support hundreds or even thousands of CD-ROMs, offering broad platform support, high speed, and excellent management tools. Bring lots of money!

Some resources.

A. Mailing list – CDROMLAN – dedicated to sharing CD-ROMs on LANs. Good information, and an excellent FAQ. Send a message to listserv@listserv.idbsu.edu With the command "subscribe cdromlan" in the body of the message.

B. FAQs and other WEB documents. The CDROMLAN has a somewhat dated FAQ that is still good. http://local.uaa.alaska.edu/~angjg/faq/faq00.html

C. InfoWorld magazine's home page offers all my reviews of competing products – look at http://www.infoworld.com Select "search" and then look for "cdrom server".

D. "Sharing from scratch: How to network CD-ROMs" by David Doering, in "The Magazine for Electronic Media Productions and Users", volume 11; Issue 8, pages 32-41. An excellent article that covers much of the territory we covered here.

A side note –
Clients and Y2K

In the discussion in Reykjavik, I mentioned that there would be problems with some clients. I commented that DOS and Windows 3.X machines would be going away in the year 2000. This was received with some surprise, and I was asked about this several times in the next few days.

Of course, if your software does not use date information, Y2K won't be a problem. However, date information pops up in some unlikely places – such as contract expiration information for software. If you have software that is timed, it could stop working if the operating system feeds it the wrong date. You'll need to make your own determination as to the seriousness of Y2K problems in your environment.

Most vendors have their own Y2K information centers on the Internet. Check with them for information.

DOS is a rather vague term, as there have been many versions from a number of vendors, including Microsoft, IBM, Digital Research, Novell, and Caldera. A check at the Microsoft Y2K home page reveals that versions 5.0a through 6.22 are listed as being "compliant with minor issues". IBM's home page is touting a Y2K complaint DOS. Digital Research's DOS was sold to Novell, and then to Caldera. Caldera is also touting a Y2K compliant DOS on their home page.

Several industry reports indicate that Windows 3.X has Y2K problems, and that Microsoft has indicated they will not undertake to provide solutions to these problems. A check of the Microsoft home page indicates that Windows is "Compliant with minor issues".

With any operating system, there are concerns that the BIOS and/or real time clock of the systems in question might not be able to handle dates past the year 2000. They could pass bad date information to the operating system, causing problems for an otherwise Y2K compliant system. Older systems are the ones most likely to be affected by BIOS and real time clock problems.

There are a number of good resources on the Internet covering this issue. The Ziff-Davis page is an excellent starting point, one that has many pointers to other resources. It also has free diagnostic software that can help you get a handle on your Y2K situation.

Home page addresses:

Microsoft - http://www.microsoft.com/technet/topics/year2k/default.htm
IBM - http://www.software.ibm.com/os/dos/
Caldera - http://www.caldera.com/products/drdos/index.html
PC-Magazine's Y2K resource page - http://www.zdnet.com/zdy2k/

FISHLIT, A REVIEW OF NISC SOUTH AFRICA'S AQUATIC SCIENCES DATABASE

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ABSTRACT: FISHLIT, a bibliographic database on fish, fisheries and aquaculture produced by NISC South Africa, has been in existence since 1985 and is currently available on CD-ROM, being included on the NISC publications Aquatic Biology, Aquaculture and Fisheries Resources, and Fish and Fisheries Worldwide, and the Internet. An historical account of the design and development of FISHLIT, including a description of the data structure, database size and growth, is provided. A breakdown of source material, for example scientific articles, reports, popular articles and books, is given, as well as the grey literature indexed, a notable strength of this database. A bibliometric analysis is made of the two anthology CD-ROM titles on which FISHLIT is published in terms of subject coverage and numbers of records. Topic coverage is graphically presented and the application of FISHLIT to areas of aquatic science, such as ichthyology, aquaculture and fisheries management, is discussed. Comparisons are drawn between FISHLIT and other currently available aquatic science databases.

KEYWORDS: information technology, aquatic science, bibliographic database, fish, aquaculture, fisheries, data structure, database production, data collection

Background

NISC, founded in 1988, is an electronic publishing company with headquarters in Baltimore, Maryland in the United States. There are six NISC branches world-wide, including the United States, South Africa, Singapore, India, Chile and Mexico, and NISC currently publishes more than one hundred bibliographic and full-text databases on 53

CD-ROM titles. In addition to publishing databases, NISC compiles several databases and markets all NISC products worldwide. NISC South Africa in particular markets all NISC products throughout Africa and compiles the FISHLIT database.

FISHLIT is a bibliographic database on fish, fisheries and aquaculture produced by NISC South Africa in co-operation with the JLB Smith Institute of Ichthyology in Grahamstown, and the Oceanographic Research Institute in Durban, South Africa. Initiated in 1985 to computerise the information function of the world renowned JLB Smith Institute of Ichthyology Library, FISHLIT has grown into an internationally recognised database used by a wide variety of aquatic scientists. FISHLIT is now published on the two NISC discs, Fish and Fisheries Worldwide (FFW), and Aquatic Biology, Aquaculture and Fisheries Resources (ABAFR).

NISC disc features

Discs published by NISC cover a wide variety of topics and a particular feature of NISC CD-ROMs is the anthology disc. These are single discs on which suites of closely related databases are integrated, offering a platform for the publication of large and small databases, integrating diverse resources, creating new, unique database combinations, and significantly increasing the size of the searchable information storehouse. A valuable advantage of anthology publishing is that of composite records. Databases are not mutually exclusive and in many instances a number of database producers may enter the same record in each of their respective databases. Special duplicate detection software designed for NISC discs resolves this problem by combining all the information that is shared between common records, as well as any unique data, to create a kind of super record or composite record. The sum of several records is more valuable than the single record alone as keywords are combined and abstracts added, enhancing the record's searchability.

FISHLIT: A brief historical account

In 1984 a decision was taken to computerise the holdings of the well-known JLB Smith Institute of Ichthyology Library, formerly known as the Fish Library and Information Centre, in Grahamstown, South Africa (Crampton 1988). This decision led, in 1985, to the design and development of the FISHLIT database by Margaret Crampton, then the librarian at the JLB Smith Institute. Initially produced by the JLB Smith Institute library in co-operation with the South African Water Information Centre (Crampton 1988), FISHLIT was later, in 1990, acquired by NISC USA to publish on their Fish and Fisheries Worldwide disc. Realising a need for indigenous information and local service NISC USA, headed by Fred Durr, approached Margaret to run a NISC for Africa and in May 1995 NISC South Africa was founded. A lull in the production of FISHLIT followed as attention focussed on various other aspects of NISC, such as developing discs and licensing databases. Subsequently, in the mid-nineties a permanent staff member was employed to build FISHLIT along with several students who assisted part-time with the indexing. A second permanent staff member has since been employed and the part-time staff number increased to eight. Strong links are still maintained with the JLB Smith

Institute library that provides many of the source materials and assists with document delivery.

Database design
FISHLIT is a bibliographic database, each record representing a publication and made up of a number of searchable fields. These include the author, or authors, of the publication. Author information is stored in a sub-database, as is much of the additional information included in FISHLIT, and in many cases these files are unique to FISHLIT. Contact details for first authors, in the form of postal addresses and/or URL or email addresses, are maintained up to date throughout the database to assist NISC disc users in requesting publications if the journals are unavailable to them.

The language or languages of both the article and the abstract are included as searchable fields, as is the article title.

The journal name, in the form of a coden, is entered along with the journal volume, journal number and publication year. The codens are standardised through the use of the authority list of codens produced by BIOSIS Serial Sources. Publications from almost three and a half thousand different sources are indexed for inclusion in FISHLIT and an important aspect of NISC indexing is to target grey literature as well as mainstream journal publications. The contributions by codens represented in BIOSIS is 46% whilst those included under "grey literature" make up the remaining 54%. These grey literature codens are assigned to publications that do not occur in the BIOSIS Serial Sources and include articles found in popular magazines and newspapers.

On average, 15 keywords are entered per record and these are also standardised, through the use of the ASFIS thesaurus. A high standard of indexing for FISHLIT is maintained by ensuring that all indexers are post-graduate students holding at least a Master of Science degree in one of the aquatic disciplines. This ensures that publications are scanned thoroughly and detailed keywords ascribed to each record.
The holding library for each reference is included in the database but is not as yet one of the searchable fields. This will change however in the near future, and once it is possible to search by this field, locating literature and document delivery will be considerably easier.

A particular strength of the FISHLIT database is the inclusion of the FISHLIT and Fisheries Review geolocators file. Indexers include as broad or as detailed geographic information as is provided in the article which significantly enhances the searchability of the records.

A second important feature of FISHLIT is the inclusion of taxonomic identifiers. As well as paying particular attention to including detailed geographic information, FISHLIT indexers take care to include taxonomic, both scientific and vernacular, identifiers if they are available in the text. The FISHLIT database is networked to the FISHNET database of the JLB Smith Institute fish collection thus access to constantly updated scientific names is available. Family names are automatically inserted once the genus and species names have been entered into the database, eliminating any potential spelling errors.

All fields in the FISHLIT database undergo strict validation at several stages during the building of the database and records are thoroughly, manually edited before being included in the main FISHLIT file.

The current number of records in FISHLIT is approaching 83 000 and the database has rapidly grown from the small in-house system that it was, into an internationally recognised database. The recently expanded part-time staff body will ensure increased monthly inputs and extensive efforts are being made to expand the coverage of FISHLIT to include aquatic life forms other than fish, as well as being as comprehensive as possible in the fields of ichthyology, fisheries and aquaculture.

As mentioned earlier, FISHLIT is published on two NISC aquatic titles, Aquatic Biology, Aquaculture and Fisheries Resources, or ABAFR, and Fish and Fisheries Worldwide or FFW, and these two discs are now discussed in detail.

Fish and Fisheries Worldwide (FFW)

FISHLIT is published with nine other databases on Fish and Fisheries Worldwide, the largest being the Fisheries Review database that was formerly compiled by the US National Biological Service and is now incorporated in FISHLIT. Other databases included on FFW are Fish and Wildlife References Service, Fish Health News, Fish Viruses and Diseases, Castell's Nutrition References and AQUACULTURE. Figure 1 illustrates the contributions by each of these databases to the disc in terms of numbers of records.

FFW covers a wide variety of topics including aquaculture and fish diseases, ecology, physiology, fisheries, systematics, economics and pollution.

Two important databases have recently been included on this disc. Firstly, is a subset from the MEDLINE database dealing with fish diseases in aquaculture species, the effects of a fish diet on human health, fish oils, and fish and shellfish poisoning. Secondly is the database of the Fishing Industry Research Institute (FIRI) built by the CSIR in Cape Town, South Africa, which deals with aquaculture, fishing industries, and fish and shellfish processing and products.

Aquatic Biology, Aquaculture and Fisheries Resources (ABAFR)

The second disc hosting FISHLIT is Aquatic Biology, Aquaculture and Fisheries Resources which incorporates the whole of Fish and Fisheries Worldwide with Part 1, the living resources part, of the well-known ASFA database, and the relevant fisheries and aquaculture subsets of the CAB (Commonwealth Agricultural Bureau) Abstracts and AGRIS files (Figure 2).

These major collections under one CD-ROM title provide unparalleled access to information on the science and management of aquatic organisms and their environments

FFW and ABAFR are both available on CD-ROM and Internet.

Growth of FISHLIT

Figure 3 illustrates the growth of FISHLIT over the past decade by showing the number of new records added to FISHLIT expressed as a percentage of the total number of new records added to Fish and Fisheries Worldwide annually since 1985. There has been a gradual but steady increase in the contribution by FISHLIT records that is clearly illustrated by the percentage contribution. The significant increase in this contribution coincides with the hiring of a permanent indexer in 1995, as does the further increase in 1997.

The number of records added for 1998 is exceptionally low and it should be noted that this lag is expected for current year publications. Due to waiting for journals to be accessioned through the libraries, and because the information on the discs is updated once every three months, it is usual for additions of current year publications to only become obvious towards the end of the year and the beginning of the following year.

Figure 4 also serves to illustrate the growth of FISHLIT by comparing it to the growth of the well-known ASFA database by using a general search on fish including the keyterms "pisces" and any word beginning with "ichthy". As expected the number of new records added to ASFA is considerably higher than those added to FISHLIT. There are two reasons for this. Firstly, ASFA was initiated in the early 1960's whilst FISHLIT was only conceived in 1985. Secondly, ASFA has considerably more input centres around the world with a much larger staff base. However it is worth noting that there is a definite upward trend of new records being added to FISHLIT which will not only be maintained but also improved upon.

FISHLIT Source Material

Each publication included in the FISHLIT database is assigned a type code indicating the type of literature in which the publication is found. Figure 6 illustrates the proportions of types indexed for FISHLIT. The majority, almost 75%, is scientific articles from mainstream journals. Reports and popular articles are the next most important types and, to illustrate relative proportions, the contributions by short communications, books and conference proceedings were also plotted. There are 46 type descriptions currently in use and other examples include pamphlets, theses, bibliographies, atlases, workshops, microfiches, films, letters, appendices and annexes.

FISHLIT Subject coverage
Publications indexed for FISHLIT are assigned one or more subject codes broadly describing the main topics covered in each article. These are numerical codes describing 86 categories, and 8 examples of the more common ones used are given in Table 1. The marine, freshwater and estuarine categories each include fish, molluscs, crustaceans, algae, plankton, invertebrates, mammals and birds. These figures do not and should not add up to 100% as some publications are assigned categories such as catadromous or anadromous fish, civil engineering, climate and weather, and legal aspects and may not have also been given an aquatic environment type code.
Codes are also assigned to indicate whether publications include color or black and white illustrations, or checklists.

Although FISHLIT has mainly focused on fish, extensive efforts are now being made to expand coverage and include aspects of invertebrate biology and management as well as plankton and algae.

Table 1. Subject coverage for FISHLIT (September 1998).

Subject	Number	Percentage
Aquaculture	14 006	18
Fisheries	11 517	15
Management, education, policy, legislation	4 035	5
Physiology, biology, biochemistry	24 930	33
Marine	29 630	38
Freshwater	27 446	35
Estuarine	3 031	4
Ecology, conservation	14 017	18
Taxonomy	6 610	9

Bibliometric Analysis
Comparisons were drawn between FISHLIT and other databases by considering a number of example searches, all of which were done using the most recent (June 1998) release of the comprehensive anthology disc, Aquatic Biology, Aquaculture and Fisheries Review. Search examples were conducted under the broad topics of fisheries and aquaculture, as well as an example using scientific names. The keywords used and the number of hits for each search are given above the pie charts that illustrate the relative contribution to the search results by each of the databases in terms of numbers of records. Although ASFA has been accepted as the industry standard up until now, the following figures clearly illustrate the importance of integrating many databases on a single disc.

Fisheries (Figure 6)
FISHLIT contributed the most records, followed by ASFA and Fisheries Review, to the first search done on marine reserves in Africa. Almost equal contributions were made by FISHLIT, ASFA and Fisheries Review in the search using marine fishery management

and Africa as the keyterms. Although ASFA makes large contributions to the remaining two searches, one on artisanal and subsistence fishing and one on fishing gear, the benefit of including the other smaller, but nonetheless significant databases is clear as one is getting access to about fifty percent more information.

The composite record contribution is significant in all these searches, an important point considering that these are the super, value-added records created from records common to more than one database file.

Aquaculture (Figure 7)
The second set of search examples concerned aquaculture and introduces the newly added MEDLINE subset that contributed large proportions to the fish diseases and particularly the fish oils searches. Databases such as CAB and AGRIS featured more prominently under these aquaculture-orientated searches. FISHLIT played a rather significant role in the aquarium culture or ornamental fish search, and both ASFA and FISHLIT contributed significantly to the cage culture search.

Scientific names (Figure 8)
This set of searches done using scientific names illustrated the importance of taxonomic identifiers. As mentioned earlier, FISHLIT indexers take care to include as much taxonomic detail as possible and the FISHLIT database is networked to the FISHNET database of the JLB Smith Institute fish collection, allowing access to constantly updated scientific names.

ASFA, Fisheries Review and FISHLIT all contributed almost equally to the tilapia search results, whilst AGRIS and CAB made slightly smaller contributions. In the orange roughy search, ASFA and FISHLIT contributed the most whilst the abalone and catfish searches follow a similar pattern to the first two searches, with ASFA and FISHLIT contributing the largest number of records.

Conclusions
In conclusion, FISHLIT is a rapidly expanding aquatic science database aiming to comprehensively cover ichthyology, fisheries and aquaculture publications, with a particular emphasis on the African literature. By increasing the topic coverage of literature scanned, this database will become more meaningful to a broader range of aquatic scientists. Since no single database can provide 100% coverage, as illustrated through several search examples, the value of FISHLIT as well as that of the other databases with it is integrated, is increased through anthology publishing. Another important point illustrated from the search examples is the use of anthology discs in identifying and evaluating databases, an exercise especially useful to persons intending to purchase bibliographic information.

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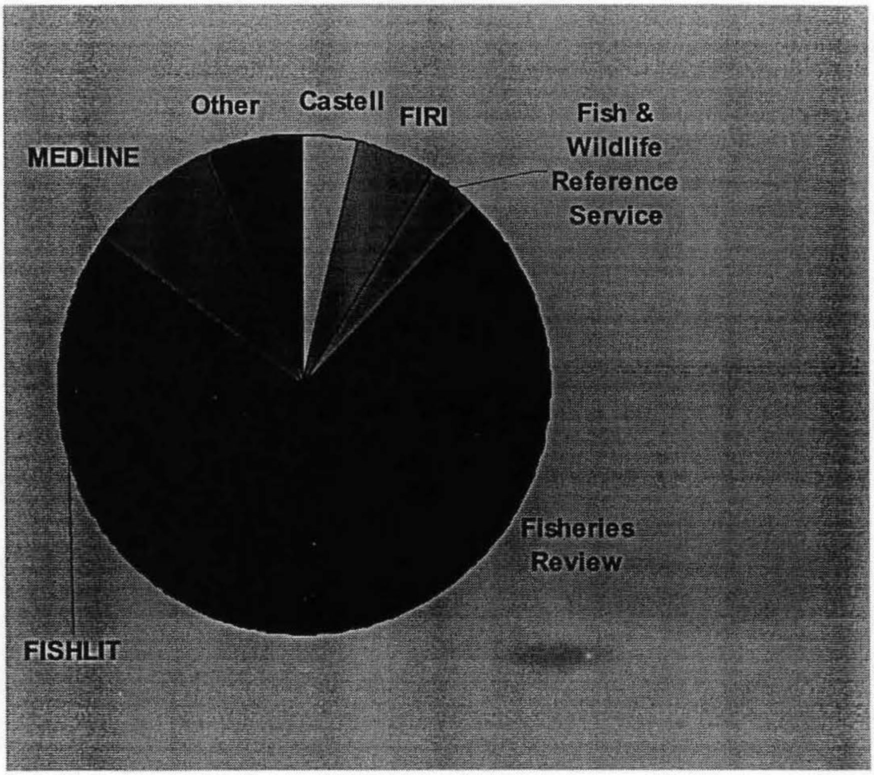

Figure 1. Pie chart illustrating make up of Fish and Fisheries Worldwide (August 1998) and relative contributions by each database in terms of numbers of records.

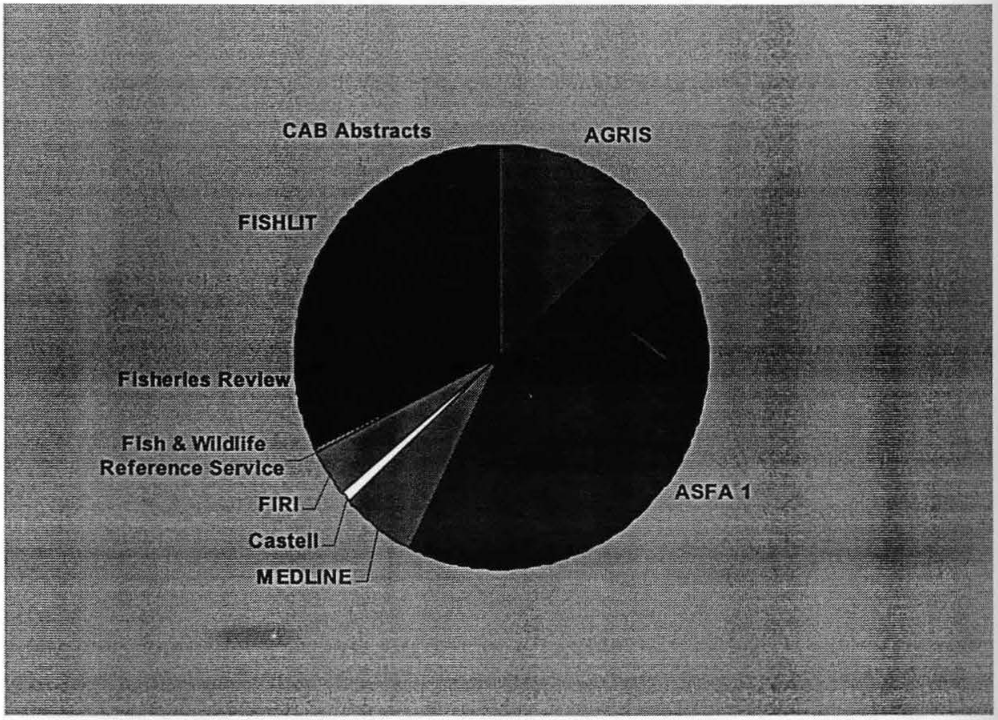

Figure 2. Pie chart illustrating make up of Aquatic Biology, Aquaculture and Fisheries Resources (June 1998) and relative contributions by each database.

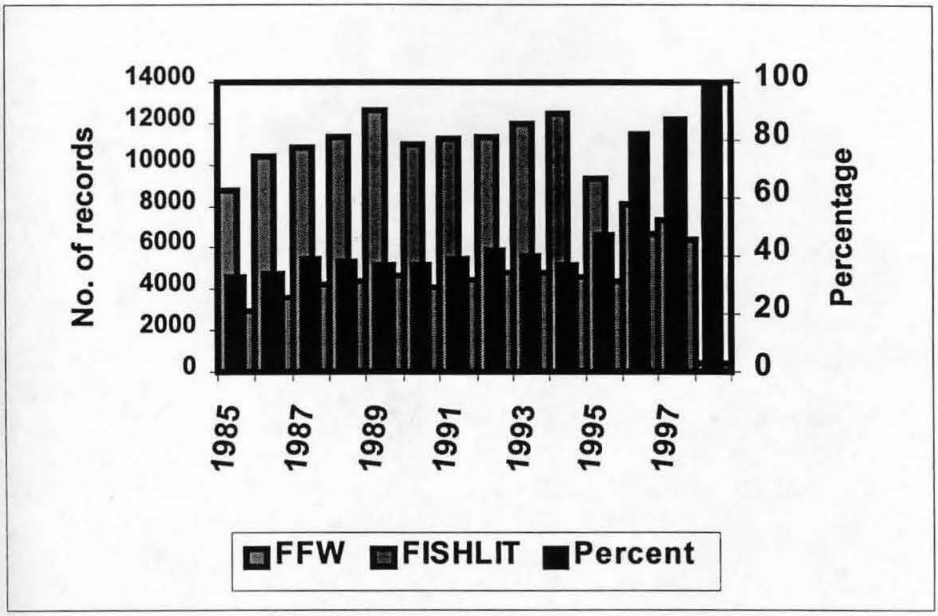

Figure 3. Growth of FISHLIT database illustrated by number and percentage contribution by new records added to Fish and Fisheries Worldwide annually since 1985.

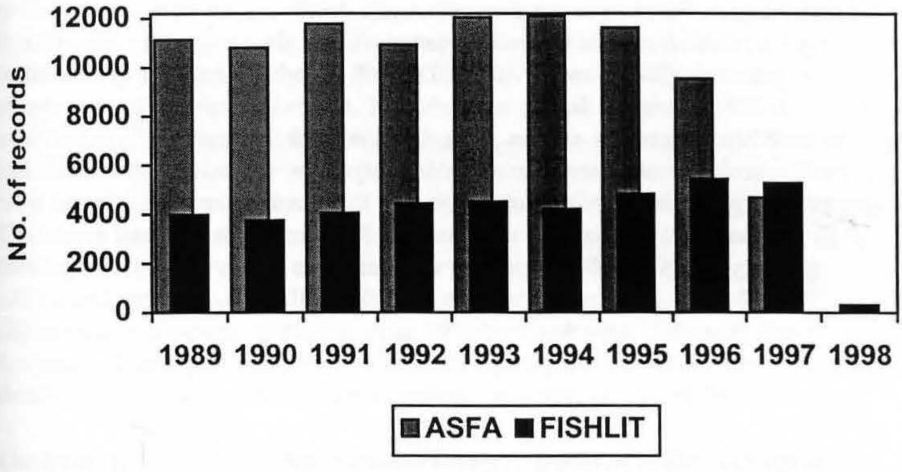

Figure 4. Growth of FISHLIT compared to growth of ASFA database demonstrated using the search "fish* or pisces or ichthy*" . Search was performed on Fish and Fisheries Worldwide (August 1998).

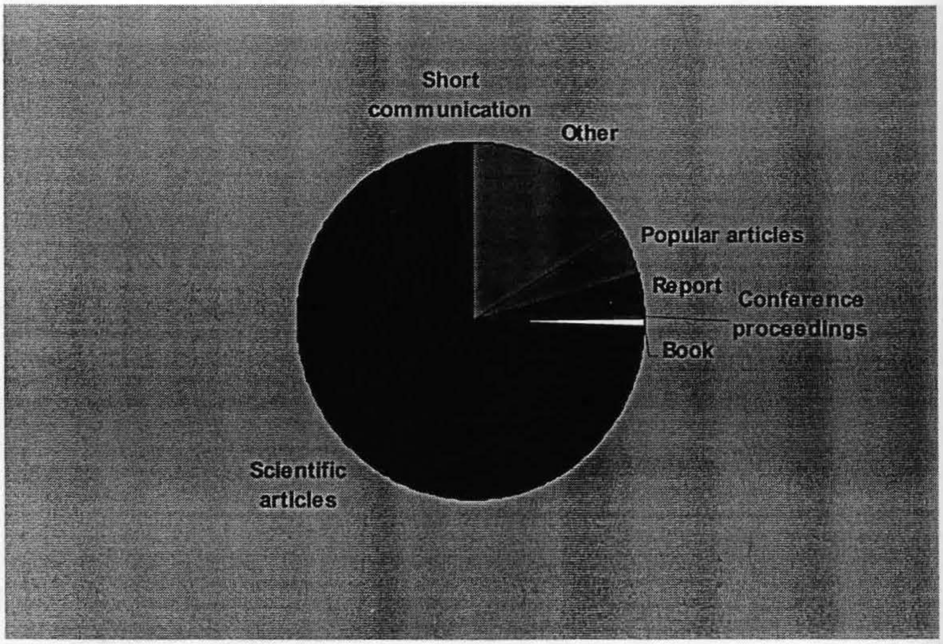

Figure 5. Pie chart illustrating percentage contributions by some of the publication types indexed for the FISHLIT database (September 1998).

SPRILIB MULTIMEDIA: NEW DATABASES AT THE SCOTT POLAR RESEARCH INSTITUTE

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ABSTRACT: The current SPRILIB database of the Scott Polar Research Institute is a conventional bibliographic facility containing approximately 130,000 records relating to the international published literature for the polar and cold regions. However, in addition to its large holdings of published literature, the Institute also holds extensive collections of manuscripts, photographs, paintings and artifacts. In SPRILIB MULTIMEDIA, our aim is to bring all of these resources together in a suite of databases to be searched either as a single resource including all material types or individually. A POLAR BIOGRAPHICAL ARCHIVE is also under construction to provide complimentary information on the participants in polar expeditions. This paper describes work-in-progress rather than a completed resource.

The Scott Polar Research Institute (SPRI) is unusual in housing a Library, Archives, Picture Library and Museum together on one site. The Library is the world's largest specialist collection for its subject. The Archives is the largest repository for historic British polar expeditions. Most of these expeditions are also well-illustrated in the collections of the Picture Library, though the latter is now rapidly extending its coverage of more recent subjects and events. The Museum is small but choice with the Arctic expeditions of Franklin and the Franklin Search, and the Antarctic expeditions of Scott and Shackleton particularly well represented. Up until now, these various collections have experienced unequal treatment with regard to detailed cataloguing and indexing. The library has been catalogued and indexed since its origin in 1920 resulting in the development of a very large card catalogue and, since 1985, a rapidly growing bibliographic database (SPRILIB). Recent publications are listed in *Polar and Glaciological Abstracts*, published since 1990 by Cambridge University Press. Accessions lists exist for all other collections, that for the Picture Library providing most detail. A comprehensive manuscripts catalogue has been published (Holland 1982).

The building of the Shackleton Memorial Library, illustrated at this conference by a poster, forms just part of a wider project, the Shackleton Initiative. The central concept underlying this Initiative is to improve access by all possible means to the unrivalled holdings of the Institute. Sir Ernest Shackleton's name and reputation will be known to all. His son, Edward, Lord Shackleton, gained equal distinction as a politician and statesman with a particular interest in the polar regions. As a student, he was also co-leader of the 1934-35 Oxford University Ellesmere Land Expedition.

In the Shackleton Initiative, access is interpreted in both physical and intellectual terms. Physically, clearly, it is most obviously embodied in the new Shackleton Memorial Library. Collections which have been kept in store for ten or more years will now be placed on the open shelves in the spectacular new building. Equally significantly, installation of a lift means that the library is accessible for the first time to the disabled.

Improving intellectual access is an ongoing process which takes a variety of forms. Improved cataloguing and indexing receives high priority particularly for those collections - the Picture Library and Museum - which have received less attention than others in the past. Next, we wish to make the finding tools so created accessible wherever possible on the Internet. There are some constraints on loading a full Internet version of SPRILIB but these do not apply to the loading of other resources, nor to the loading of subsets extracted from SPRILIB.

Table 1: SPRILIB MULTIMEDIA: current and future projects

Current projects:	ICE AND SNOW	(c. 30,000 records)
	ANTARCTICA RETROSPECTIVE	(c. 33,000 records)
	POLARPICS	(c. 1,000 records)
Future projects:	POLAR BIOGRAPHICAL ARCHIVE	
	SPRI MUSEUM	
	SPRI ARCHIVES	
	possible future subsets of SPRILIB	

Of the initial three databases, two will be subsets of SPRILIB. For the glaciological database ICE AND SNOW, this will in fact be a re-launch but with more references, an improved search interface, and a different address from its previous 1995 loading. ICE AND SNOW is the official database of the World Data Centre C for Glaciology, which is located within SPRI Library. It will be searchable by keyword (title and abstract), author, subject area and geographic region.

The other SPRILIB subset ANTARCTICA RETROSPECTIVE(AR) was described in a poster at PLC16 (Mills 1997). Whilst not exactly as outlined, the new database will perform essentially the same function as there envisaged, particularly when combined with the proposed POLAR BIOGRAPHICAL DATABASE. AR is a bibliographic database and, as its name implies, one which will provide particularly comprehensive coverage for the history of Antarctica. However, more contemporary material will not be excluded. The aim is to complement rather than duplicate the information provided by the COLD database of the Library of Congress (http//cold.loc.gov/star/login-session3.html), but whereas that service is strongest for scientific subjects since 1962, AR is comprehensive for all subjects up to 1961 and offers rather better coverage than COLD for topics such as international law, literature, and other non-scientific subjects from earliest times to the present. The comprehensiveness of AR for the period up to 1961 is the result of an extended cataloguing campaign, the Historic Antarctic Bibliography Project, funded by the British Antarctic Survey. Whilst this project still continues, it has reached such a stage that many of the largest biographies have had their contents added to SPRILIB, AR's parent database. AR will be searchable by keyword (title and abstract), author, geographic region and expedition.

The third of the databases to be established in the initial Internet loading is POLARPICS, the database of the Picture Library. Prior to January 1997, the numerous requests for reproduction of prints and film were handled by the Archives where they generated more work than the Archivist and Curator could reasonably handle. As with other aspects of the Shackleton Initiative, the Picture Library was set up to improve access to the very extensive photographic collections with the objective of reaching a self-financing basis within two years. This objective has already been achieved largely thanks to the exceptional work of the Picture Library Manager, Philippa Smith. With most income coming from a comparatively small number of well-known photographs, an early priority for the Picture Library has been to ensure that the rest of its collection becomes better known and more accessible to those wishing to use it. Good progress has been made in cataloguing the newer collections and in converting the detailed accessions list for loading to the new POLARPICS database. At the time of writing, POLARPICS is accessible only as an in-house database. In the Internet loading, POLARPIC records will be linked to the detailed listings available for some collections and - increasingly - with low-resolution images as the campaign to scan the collection makes progress. Like ANTARCTICA RETROSPECTIVE, POLARPICS will be searchable by keyword (title and abstract), author, geographic region and expedition.

SPRILIB MULTIMEDIA will use the MUSCAT Explorer web-based front-end software. Those familiar with the Institute will be aware of its use since 1985 of innovative probabilistic retrieval programs designed by Martin Porter (see Porter & Galpin 1988). Whilst apparently idiosyncratic to librarians brought up on Boolean methods, Muscat and Muscat-influenced interfaces have proliferated on the WWW to such an extent as to be now standard. MUSCAT Explorer itself is now used on a wide number of prestigious sites of which SPRI is only the most recent. In addition to its ability to provide a search interface likely to appear immediately familiar to most users, being an existing Muscat user will greatly facilitate writing of programs enabling the extraction of records from SPRILIB for periodic updating of the Internet services.

Of the future projects, in time we plan to load Internet versions of the Museum and Archives databases though much work remains to be done here. The POLAR BIOGRAPHICAL ARCHIVE is rather more advanced thanks almost entirely to the work of John Reid, a library volunteer and former FID (i.e. member of the Falkland Islands Dependencies Survey). John has already compiled a card catalogue listing participants in all Antarctic expeditions from 1898 through to 1945. Entries give full names; birth and death dates where known, expeditions participated in and role in each; medals; and other polar related activities. No attempt is being made to provide potted biographies but in time these records will be loaded with links to the published biographical literature.

With the exception of the glaciological database, ICE AND SNOW, a characteristic feature of all of these resources is that they will be searchable by expedition. That is, for any specific expedition, it will be possible to retrieve:

- all publications describing their activities
- all publications reporting their scientific results (to 1945 for Arctic, to 1959 for Antarctic)
- all photographs and film
- all associated artifacts, including paintings
- all maps either surveyed by the expedition or depicting their activities
- brief biographical information on all participants

Using this feature we shall eventually be able to search across all databases to retrieve all types of material held for all polar expeditions.

In summary, the Scott Polar Research Institute presents unusual opportunities for the design and establishment of interlocking information facilities covering a wide range of materials from conventional publications and grey literature, through manuscripts, to photographs, paintings, sculpture and drawings, and to artifacts of almost every description. We are just at the beginning of this process but, blessed with our new magnificent building, it is clear that we must now attempt to match it with equally magnificent services and facilities.

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WATER RESEARCH, ELECTRONIC JOURNALS AND DATABASES: THE SOUTH AFRICAN WAY

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ABSTRACT: In South Africa, the Water Research Commission (WRC) was established to promote, coordinate and fund water-related research. The organization derives its income from a levy on water consumption and uses the money to fund a variety of research projects annually. This paper gives an overview of the activities of the organization and provides details of WRC products and publications.

Introduction

South Africa is a water-scarce country and a lack of sufficient water supplies has been identified as the single most important factor which will limit the country's socio-economic development in the 21st century. The average annual rainfall is 483 mm (compared to the annual world average of 860 mm), rainfall is unevenly distributed, evaporation rates are high, and extended and severe droughts occur regularly. Projections indicate that the country will experience a serious decline in the availability of fresh water between now and the year 2050. Absolute shortages already occur in some regions, with the result that various large inter-basin water transfer schemes have already been constructed.

The country is also poorly endowed with suitable aquifers, with groundwater forming only about 15 % of the country's water supplies. Water supply is, therefore, mainly dependent on surface supplies, which are subject to huge evaporation losses. To further complicate the situation, severe pollution problems, associated with a high rate of population growth and sustained industrial, mining and agricultural development, exist.

Against this background, and following a severe drought in the sixties, a commission of enquiry into water matters was appointed. In its report, the Commission emphasized the important role that research will have to play in optimizing water management in South Africa, and recommended that water research should be intensified and better coordinated. The Water Research Commission (WRC) was established in 1971 and the organization was tasked to promote the coordination, communication and cooperation in the field of water research.

The WRC in action

The WRC derives income from levies on water consumption. The organization does not conduct its own research, but funds research under contract with other agencies, e.g. universities, statutory research organizations, local authorities, consultants, water boards, government departments, non-government organizations and industry. Research applications from such institutions are received and evaluated once a year, a total of 250 to 300 ongoing and new projects being funded annually by the WRC.

The WRC's research programme covers the following research fields:

1. Developing communities: water supply and sanitation
2. Potable water supply
3. Municipal wastewater management
4. Water quality management
5. Groundwater
6. Agricultural water management
7. Industrial water management
8. Membrane technology
9. Hydroclimatology
10. Integrated water resource management
11. Surface hydrology
12. Conservation of water ecosystems
13. Mine water management
14. Water policy
15. Hydraulics
16. Information technology and research support services

Transfer of information and technology

In accordance with its mission statement, the WRC undertakes to *Promote effective transfer of information and technology*. In order to fulfil this responsibility, the following actions were taken:

1. A bibliographic database, ***Waterlit***, started in 1974, covers references to local and international publications on all aspects of water. At present, the database covers more than 300 000 references to journal articles, reports, conference proceedings, books, etc. A special *Waterlit* thesaurus with more than 30 000 terms and phrases is used to describe the contents of publications for inclusion into the database. *Waterlit* does not include abstracts, but uses an extensive system of identifiers and descriptors to describe the contents of individual publications. Most of the publications (95%) listed in the database are available in South Africa and every entry indicates the

holding library of the specific publication. The CD-ROM version of the database is published commercially by NISC.

2. All **project reports** resulting from research projects funded by the WRC are published for wider distribution. Most reports are available at no cost to South African residents while a small amount is charged when reports are supplied to international clients.

3. Two journals are published regularly:
   * ***Water SA*** is the WRC's accredited scientific journal, which contains original research articles and review articles on all aspects of water science, technology and engineering. The journal provides a forum for South African scientists and engineers to introduce their research results nationally and internationally. In recent years, the journal also had increased support from overseas authors and readers from as far afield as the Ukraine, Spain, Argentina, Finland, Australia, etc.
   * The ***SA Waterbulletin*** is a bi-monthly news journal, aimed at promoting the transfer of technology by announcing the availability of reports, manuals, guides, etc. that emanate from WRC sponsored research.

4. The WRC develops and maintains a database of water and water-related **research projects conducted in South Africa**. The information is intended for research organizations and scientists who are active in these fields. The database enables better planning of projects, avoids unnecessary duplication and increases awareness of current research.

Electronic information

The arrival of the age of electronic information offered the opportunity to market and distribute the information resources developed by the WRC globally:

1. The ***Waterlit*** bibliographic database is now accessible via the WRC's web site. **Free** access is available to all South African residents, while users in the rest of the world have to subscribe on an annual basis.
2. **Free** web access to a list of available WRC project reports, together with the facility to use an electronic order form.
3. **Free** web access to the full text version of the SA Waterbulletin.
4. **Free** web access to abstracts of articles published in Water SA, together with the facility to download the full article.
5. **Free** web access to the database on water-related projects undertaken in South Africa.

Conclusion

South Africa is a developing country, experiencing water-related problems which are similar to those in the rest of Africa. Through the active involvement of the Water Research Commission, South African water managers can now make strategic decisions, based on sound research results.

A COMPARATIVE EVALUATION OF BIBLIOGRAPHIC INFORMATION RESOURCES FOR MARINE AND AQUATIC SCIENTISTS

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ABSTRACT: Information for aquatic scientists is increasing at an exponential rate and can be conveniently accessed through bibliographic databases on CD-ROM and Internet. Not only does the information proliferate, but so do the CD-ROM and Internet titles and publishers.

This paper will evaluate eight CD-ROM and Internet publications of bibliographic databases in aquatic fields. The survey will include such titles as - Marine Oceanographic and Freshwater Resources, (MOFR), - Aquatic Biology, Aquaculture and Fisheries Resources, (ABAFR), - Aquatic Sciences and Fisheries Abstracts, (ASFA), - Fish and Fisheries Worldwide, (FFW), - WATERLIT, and - Water Resources Worldwide,(WRW). and Arctic and Antarctic Regions.

The analysis will cover such issues as the total number of unique records, the database collections, the database overlaps between discs, the cost per thousand records and the relevance of different discs to different research fields. The quality of the records, subject coverage over time and the geographic bias will also be assessed. Where possible these issues will be presented graphically. The talk will be illustrated with examples to demonstrate innovative software features.

BERENICE – BARENTS LIBRARY NETWORK FOR EUROPEAN DIMENSION A PRESENTATION

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ABSTRACT: Co-operation between libraries in the Barents Region has now stepped into a new era: Berenice Centre has initiated its activities. Funding from the European Union Interreg II-programme together with national funding from Sweden and Finland made it possible. The total amount is about 3,5 million Finnish marks and this project will last until the end of June 1999.

The Barents Region's library system is distinctive in Europe in that it is a comprehensive network providing universal access to information and culture. This library system includes all types of libraries from the very smallest village libraries to university libraries, from special libraries to central national libraries. Every person regardless of social, economic or educational status may use all the services free of charge in any library. Each library functions as a node in the open information network.

The Berenice Centre was founded in the Barents Region to study differing attitudes to information, how library status and practices differ and how the perception of an informed society and its implementation differ in countries of European Union and its neighbors. The aim of augmented cooperation within the Barents region is to increase the availability of information. The task of the Berenice project is to assemble and distribute information about libraries and information services, expand the use of modern technology, develop the functions of libraries and ensure continuing education. Berenice may then function as a model for other library and information technologies within other European regions.

The main idea is to build up networks to connect Barents regions librarians across all the different boundaries in the area: the border between East and West, national borders, European

Union boundaries, language barriers, diverse cultures, economic and administrative diversity. Networks will be built to connect also librarians from other remote regions in Europe with Barents librarians.

The research focus will be libraries and information services, with particular emphasis on the application of multimedia and telematic resources. Experimental projects will be designed to enhance library and information services. The emphasis of the activities is on four different areas:

- continuing education and research related with libraries (incl. Barents Library School)
- Sami and other cultural minorities (e.g. a common bibliography)
- collection work, especially sounds and pictures
- boarder-crossing co-operation within IT

Berenice acts like an umbrella over these four areas which are divided into smaller projects. Berenice as an umbrella will also try to convene all related library projects in Barents area. The European dimension of Berenice will mostly be seen in the functioning by Barents Library School. It is planned that these special further education courses would be open to interested librarians in other remote areas in Europe.

Berenice coordinators are working with their own areas of responsibility. One coordinator will work for Sami I Jokkmokk, Sweden. The others work in their own countries Sweden and Finland. A steering group consists of members from Sweden, Finland and Sami. The Administrative Committee of the Barents Interreg II-programme supervises the whole project. The vision is for the Berenice - Barents' library network to continue its operations at the close of the project.

Berenice or Barents Library Network for European Dimension is a co-operation between libraries in the Barents region, the northernmost parts of Norway, Sweden, Finland and Russia. All types of libraries are represented in Berenice; small village libraries, university libraries, special libraries and central national libraries.

Founding from the European Union Interreg II-programme in 1997 together with national founding from Sweden and Finland made it possible to start projects. The total amount is 3.5 million Finnish marks and the projects last until the end of June 1999. Berenice´s organisation consists of a leading group who gives directions and three co-ordinators who are responsible for the implements. The ordinary members of the leading group come from Sweden and Finland, the financing countries. Heli Saarinen, chief of Lapland Provincial Library in Rovaniemi in Finland is chairman during this period.

The name Berenice is significant

The name Berenice is chosen with great care. It associates with the starry sky above the Barents area, with the star flag of European Union and with the antique library in Alexandria. Queen Berenice lived 200 years before Christ and was married to Ptolemaios III of Egypt. She offered her beautiful hair to secure her husband's fortune of war. Erastothenes, the chief librarian in Alexandria, named one of the constellations in the northern starry sky Berenices hair, *Coma Berenices*. In the projects Berenice's hair symbolises all those links of contact and co-operation that will be built within and outside of the Barents area.

The aims of Berenice

Building networks across the borders to increase the availability of information is the main purpose . Mostly the borders, linguistic, cultural, national or institutional, are stimulating and give new prospects but one should not neglect that there are many obstructions. The aim is also to strengthen separate libraries, attend to different groups, especially minority groups in need of service and information, expand the use of modern technology and ensure continuing education.

As a part of a greater whole the European dimension is important. The library systems in the northern parts of Europe are already known as accessible, professional and diverse. Berenice wants to create useful models and emphasize the importance of having versatile libraries also on local levels.

The four sub-projects given priority

Berenice is an organisation for co-operation but at the same time an umbrella for different library projects. The above-mentioned resources are awarded to start and run the following sub-projects.

1. Barents Library School - BLS

Research and education are the basis for developing libraries. Berenice's head co-ordinator, Merja Rostila in Rovaniemi in Finland, is responsible for the first Barents Library School. The theme is small libraries and librarians in the Barents area are the target group. The participants are recruited from Sweden, Norway, Finland and Russia and the very first course will be held in Arkhangelsk in Russia in September 1998. Local librarians from Arkhangelsk are also invited to take part. There are two main reasons to run the course in Russia; it makes it easier for the Russian participants to take part but it also gives the visitors inside information about the Russian culture and library system.

In March 1999 the participants will meet again for a continuing week in Rovaniemi in Finland. Between the two weeks of education they will make small studies on specific subjects. The final meeting will be in May 1999 when the North Calotte Conference is held in Mo i Rana in Norway.

The second BLS course is planned to start in Spring 2000 and last until 2001 and when it goes on the third BLS course will be planned and carried out during the years 2002-2003.

2. The North Calotte in Sound and Images - NCSI

In Barents area there are many collections of sounds and images which are important historical and cultural sources but until now not easy of access. The purpose of this subproject is to draw attention to these collections and make some of them more available by new technology. Berenice has chosen to start with Ragnar Lassinatti's collection in Luleå in Sweden and with the joik collection in Tromsø in Norway.

The work with the joik collection in Tromsø Museum is planned by the University Library of Tromsø. The joiks are special traditional songs made by Sami people and the collection will be digitized according to the plan that will be presented later this year, 1998.

Ragnar Lassinantti was a well-known county governor in the northernmost part of Sweden. During his lifetime he made lots of radio programmes about the history and culture of the North Calotte. The programmes are now kept in Luleå University Library and since the Swedish Broadcasting has the copyright they are involved in this Berenice subproject as well. The working plan for Lassinantti's collection will also be presented later this year.

3. The Sami Bibliography –SB

The Sami bibliography subproject has started with building up a network of Sami institutions and librarians in Russia and in the Nordic countries. A reference group with members from each country is established by Anna Prakhova, the Sami co-ordinator in Jokkmokk in Sweden. She has also taken part in conferences and visited authorities with Sami connections to establish necessary contacts.

The Nordic countries have bibliographies of Sami litterature, but they are not complete. They are also composed differently and there is a need of a common interface to make it possible to search from all the catalogues at the same time. This problem will probably bee solved during the present financing period which lasts until July 1999. The next step is to get the Sami literature from Russia catalogued and put into the same interface. A survey of Russian Sami issues has begun and will continue during the whole period. This second step takes a lot of time to carry out and the Sami co-ordinator has to seek for continuing sources of finance.

4. The Tornio Valley Library Network- Bridging the Borders by IT –BBIT

The border between Sweden and Finland passes through the Tornio Valley. In this valley there are four Swedish and six Finish municipalities on each side of the border and in each municipality there is at least one public library. The Finish and Swedish languages are not related at all but in this special area the language and the culture are originally the same. That is the base for building up this library network.

The Swedish co-ordinator, Margareta Raattamaa in Övertorneå in Sweden, has as her main task to implement the idea of Tornio Valley Library network. The libraries along the border have like most small libraries only one educated librarian who often has to fight for grants to survive and there is not much time for development work.. By networking the librarians can get support, information and knowledge and a chance to discuss professional matters.

The plan for this subproject is complete, the work has started and the participants take part with great interest. The idea of networking is not new but there has never been time to practise it.

When the small local net functions like a natural platform it is time to take further contacts and gradually realize the vision and the symbol of Berenices hair.

Continuous information about Berenice

Berenice´s homepage [www.urova.fi/home/arktinen/berenice/] has frequent information about Berenice and its projects. The evaluation of the projects will also be presented and the plans for the future will be based on these experiences.

NORTH –SOUTH CO-OPERATION IN ELECTRONIC INFORMATION ARCHIVING: THE EXPERIENCE OF THE INSTITUTE OF MARINE SCIENCES ZANZIBAR.

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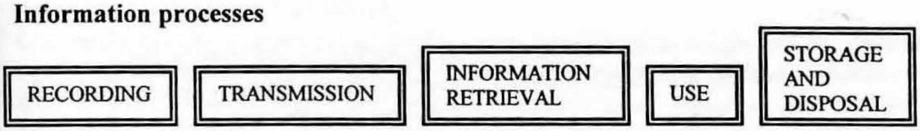
ABSTRACT: Accessing scientific information electronically is picking up in the developing world. More academic institutions are being connected to the Internet, hence increasing their access to scientific information. Unfortunately, most locally collected information is not systematically available. The information is either kept by the scientists themselves or deposited in local libraries in report forms, unrecorded and known only to the locals. In order to solve this problem there is a need for North-South co-operation in archiving the information electronically.

Introduction

Every organization collects, generates and manages information. Information is often thought of as something current, and up to-date. Whilst this may be the case for some types of information, many other types have much more static, permanent or long-lasting qualities. Every information–related activity has a retrospective aspect, and most items of information have two uses: One that is related to the present, the other that is related to conditions that previously existed. This is true for the materials of all forms of information service. Research scientists need the most current data, while politicians or decision-makers need the latest report or most recent statistical aggregation in order to plan and make decisions.

This means that the information that becomes outdated should be distinguished from information still current. The information that has passed out of currency needs to be appraised and kept in another file for possible later usage.

Information processes



The first step in information processing consists of data collection, analysis of the data by the scientists and putting the information in a communicable way. Transmission of the information through publishing in journals, conference presentations, and/or publishing on the Internet may occur. After publishing, information has to be retrieved and used by patrons. Like other commodities, information, may not be useful or valuable for a long time; the long-lasting valuable information is stored in archives for later use and the raw data are disposed of. My paper discusses the last stage of the information process.

When I joined the Institute of Marine Sciences in Zanzibar, Tanzania, in 1991, our collection was small, with about nine journal titles, 2,500 books, a few research reports and a few reprints. As the years have passed, we have succeeded in collecting more than 500 reports from local researchers, while the number of reprints received from publishers and authors has increased tremendously. The increase in number of reports and reprints has been such that we have had to design the best way to control circulation first and then make sure that these documents were safeguarded against careless handling by library patrons. At the end of 1997, we decided that all reports and reprints should be stored under the form of microfiches, a decision that solved the problem of both losing the materials and materials being spoiled. These microfiches are kept for later use, while library patrons keep on using the materials printed on paper.

With the development of technology and the advent of new information–bearing materials and the provision of Internet to the Institute of Marine Sciences Zanzibar by the UNESCO IOC and the University of Dar es Salaam computing centre, the library has been able to provide access to electronic information. Patrons have been able to surf the Internet and retrieve electronic information which only a few years ago was still inaccessible. However, with the fast changes and updates made by webmasters, the electronic information that is available changes every day. A user cannot be sure of finding the same article the next day. To solve this problem, we have introduced a system whereby articles are saved onto a disk and printed on paper, while we still have to think about other possible ways of conserving this valuable information. The library also has started receiving requested documents from RECOSCIX- WIO dispatch centre via Ariel. This process simplifies paper handling work, but, it also gives us pressure on how to store the documents.

One of the ways to store this valuable information could be to create a database that will hold the information much longer and be accessible by our patrons whenever needed, within the next four or five years to come. This database will function solely as an archive for both electronic and paper form materials that we plan to restore using the existing system.

WHY ELECTRONIC ARCHIVING?

Traditionally, archives have preserved the essential characteristics of records, their content, structure, context and authenticity, by preserving the media on which they are recorded in the original order. In the case of electronic records, this approach will not achieve the objective of preserving access to the records over the lengths of time required for archives.

This shortcoming is due to the fact that the technology necessary to retrieve the records in an intelligible form from their physical carrier changes at a faster rate than the carriers themselves. For example, in computerised systems, records storage may employ certain hardware and software. Computer files may not necessarily continue to be retrievable over extended time merely because their component parts were stored using a particular medium no longer used or available locally. Access to or retrieval of electronic records created in specific environments will usually require a capacity to replicate those measures at a later time to ensure authentic versions of records are available, even though the technical retrieval process may be different.

Electronic records are generated in the computer system which the library uses to facilitate its normal routine operations. For this reason, maintaining the accessibility of electronic records over time should not normally require significant analytical, design, programming, or hardware resources over and above those which are normally required for the maintenance of the computer systems. As applications are reviewed and re-developed, the carrying-forward of the records and their translation into the updated software and hardware technologies can be incorporated into the established system development processes.

Ensuring the accessibility of electronic records of enduring value is simply a way of meeting certain administrative requirements with which the library must in any case comply. It is my belief that the funds required by the library to employ electronic filing systems would be more than matched by the financial gains facilitated by the general accessibility to records. The benefits of maintaining records efficiently would be valuable, not just locally, but to the Western Indian Ocean region as a whole.

Electronic records of enduring value that are retained in the physical possession of the library will be protected from alteration or destruction, including anything which would render them inaccessible. Although the purpose of keeping such records in an electronic format is to ensure that institutions like the IMS can cost-effectively maintain files in a controllable form over time this must not be allowed to endanger the contents of the actual authentic record. For example, a change in the value of a data field may be permissible in a given application, but should it obliterate the pre-existing value which was required for record purposes, then we will find means to protect the previous value so that the record can genuinely reflect the original transaction which it purports to substantiate.

Advantage of electronic archiving

One might wonder why we are calling for electronic archiving and the North – South co-operation. Electronic archiving enables centralized management of data and documents from a variety of sources and under miscellaneous formats, as well as enhanced security through reliable capture, backup, and recovery. Electronic archiving also provides fast, simultaneous access to data and documents by authorised users anywhere on your internal network or Intranet. Users can find the information they need on time. However for an electronic archiving solution to be fully effective in the real world it must be linked to daily operational processes. Business process integration not only improve data integrity by ensuring the capture and preservation of critical information, but it also opens a window into the processes themselves to develop new more efficient methods and approaches.

The North- South co-operation

It is now widely recognized that new information and communication technologies have had and will continue to have a profound impact on the lives of people everywhere in the world (Shahid Akhtar 1995). Technology is allowing us increasingly global access to information. Global communication allows researchers faster and easier access to existing research and gives them the ability to share their information resources. We have the technical means of sharing data across great geographic distances. We must now find a way to preserve both the information and the access to information that will allow north and south co-operation in the marine sciences to flourish and to benefit us all.

For the electronic archiving project to be sustainable, however, I am here calling for a North -South co-operation in archiving this valuable information for the benefit of both sides. The South will benefit from the valuable information restored, while duplication of research will be minimised. Simultaneously, the North will benefit from reading what is happening in the South. And the most beneficial process is the globalisation of the marine sciences. Let us construct the passageway through which one day the globalisation of marine sciences may successfully walk. Science is nothing if not shared.

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NETWORKS IN THE PUBLIC LIBRARIES IN FINNISH LAPLAND

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ABSTRACT: Modern information technology offers many possibilities to develop services in the libraries. In sparsely populated areas, like Finnish Lapland, modern telematic communications and interactive library services play an important role in giving the inhabitants access to the information gateway. Aurora libraries, their computerised library system and Internet connections shall contribute to informational equality of inhabitants. New information technology also offers possibilities to integrate other cultural resources into the library system. In Lapland, especially, libraries and museums are developing their cooperation. The idea is that the cultural resources will be put into more efficient use in the future than nowadays. It will be possible to provide new information and know-how for the business community by joining the expertise of educational institutes into this project. The goal is to promote business and employment in the remotest area.

Manet (Finnish Lapland Libraries Network) and Monet (The first project in Northern Cultural Resources Programme) are two examples of projects set up by Lapland Regional Library and other Aurora libraries. Manet improved the availability of library services by making the Aurora computerised system available for distance use. Monet aims to integrate other cultural resources into the system.

KEYWORDS: public library, museum, network, database, distance use, cultural resources, library services

INTRODUCTION

Aurora is the computerised library system that was created by five public libraries in Finnish Lapland in 1992. In six years the membership of the network has risen to 19 libraries: 12 municipal libraries, the Rovaniemi Polytechnic with its six college libraries and the library of the Provincial Museum of Lapland.

Aurora's operation area is large (63,000 km^2) and sparsely populated (about 113,000 inhabitants, 1.8 persons per sq.km). Due to the long distances there is a need to offer a more effective and flexible library service. Nowadays modern information technology helps us to find various solutions to offer services to people living in such an area.

Aurora libraries have developed their services from that point of view. They have had many development projects during the last years. Two of them will be introduced next; Manet and Monet.

MANET

Background and objectives

Manet (Finnish Lapland Libraries FastNet) development project was started in 1996. At that time Aurora's computerised library system had operated five years. It was necessary to do some technical improvements to the network, especially because the schools in this region were seeking a new, more sophisticated and comprehensive use of public libraries. Aurora libraries started to develop the system available for distance use, which meant also many other changes in the library system. This was set up as a special development project, which ran for two years (1996 - 1998). The project's total budget was 3.1 million FIM, half of which was financed by the European Union (the Finnish objective 6 programme) and the other half by Finnish national funds: the Ministry of Education and the Aurora libraries.

Project implementation

Many technical improvements were carried out during the project: remote connections, local area network (LAN), a data protection system (fire wall), Internet connections and e-mail installations. Aurora network now uses the FastNet service by Telecom Finland Ltd, which has raised the data transfer rate to 256 Kb/s. The LAN system of each library has also been updated to a capacity of 10 Mb/s. One of the most radical improvements was to connect the whole Aurora network to the Internet. This means that the libraries now offer free use of the Internet to their customers, and that the customers are able to have access to the new interactive library from their home terminals, schools and places of employment. The services offered by the online libraries are browsing the database and the customer's personal data (with a password), loan renewal and reserving material on loan. For a small fee the libraries also offer their customers the facility of renting an e-mail box on the library server and accessing it via the library's terminal.

Project achievements

The achievements of the Manet project can be summarized as follows:

1. The member libraries now offer modern information technology for ordinary people who, in many cases, have not had the opportunity to acquaint themselves with it

before. This is why the interface of the system has been designed to be as uncomplicated as possible.

2. The project has extended the information infrastructure to the very remotest corners of Finnish Lapland. Some rural municipalities were only first connected to the information network through their libraries.
3. The staff at the libraries have gained new skills and know-how of librarianship as well as information technology through the project. Training was one of the most important aspects of the project.
4. The project has helped the libraries to contribute to sharing the cultural heritage of mankind. Not only does the new Internet connection enable the inhabitants of Lapland to access the cultural treasures of other nations, but it also gives anyone with Internet access the opportunity to study the most valuable literary heritage of Lapland: the Lapponica collection housed in the member libraries.

MONET

Background and objectives

The development of the services continues in the Monet development project. While Manet has developed Aurora network and availability of library service, Monet aims to integrate other cultural resources into the system. It requires further development of information sources and cooperation with museums, educational institutes and the business community. The project will also run two years (1998 - 2000). The total budget is 3.6 million FIM. Major financiers are the European Union (the Finnish objective 6 programme) and the Finnish national funds (the Ministry of Education, libraries, educational institutes and firms).

Monet will create the Lapland Databank, a multi-faceted media database containing material produced and recorded jointly by libraries, museums, educational institutes and business. Diploma work, literature, articles, news, images and product information will all be awailable from this database. A standardised interface will simplify data retrieval for the user (diagram 1).

The second objective is that libraries and museums will together create a digital information service. It will require of them a new kind of teamwork. During the project there will be an organized training programme to this end.

The third object is to adopt a more efficient telematic operations model for libraries, museums, educational institutes and business (diagram 2). The Lapland databank, digital information services and the expertise of educational institutes will provide new information and know-how over the Internet for the business community. The availability of these services will improve as distance begins to lose its significance. Cultural resources will be put to more efficient use. Virtual commerce will enable enterprises to seek out suitable markets from far afield. Our goal is to promote business and employment in Finnish Lapland.

A FINAL WORD

Interactive library, digital information service, cultural resources and their utilisation, development of services and operations suitable for telematic use in an interconnected environment - these are some new challenges for the libraries in the future. These things will be important and in demand and offer many new possibilities to customer service. On the other hand many traditional library services will also be in demand in the future. The role of the libraries will change. However, the most important thing is that the significance of the libraries remains and will even be enhanced.

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THE OPTIONS AVAILABLE IN THE ABSENCE OF FULL TECHNOLOGICAL CAPABILITIES: THE FULL POTENTIALS FOR THE LAW OF THE SEA DOCUMENTATION CENTRE IN THE NAIROBI UNIVERSITY LIBRARY, KENYA

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ABSTRACT: Electronic information management relies heavily on the technological capability of a nation. This must be backed by good national and international communication and telecommunication networks. In the absence of these, it becomes difficult, even with top of the range computer equipment to effectively utilize and manage information, especially in the area of information dissemination.

Since its inception, The Law of the Sea Documentation Center in Nairobi has always provided good computer equipment for information management. Our national communication and telecommunication network has been the biggest drawback when it comes to information dissemination. Nevertheless, the documentation center has exploited all avenues available to ensure that the collection is utilized. Heavy utilization of the collection has been on the increase. The options available to information workers in a country with poor communication and telecommunication infrastructure is the thrust of this paper.

THROUGH THIN AIR: THE CREATION OF THE ATMOSPHERIC SCIENCE LIBRARIANS INTERNATIONAL

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ABSTRACT: In January 1998 the Atmospheric Science Librarians International (ASLI) held its first inaugural meeting in Phoenix, Arizona. The meeting was attended by more than a dozen atmospheric science librarians from around the world. At the meeting participants profiled their libraries and services, discussed issues related to site licenses, electronic publishing, metadata and archives for polar and oceanographic data. In addition the group met with representatives from the World Meteorological Organization, the American Meteorological Society and several commercial vendors. ASLI is a free and open forum for librarians around the world to discuss and exchange information relating to the atmospheric sciences. This paper describes the evolution of the ASLI organization, its goals and activities and looks at ways that the Polar Libraries Colloquy, the International Association of Aquatic and Marine Science Libraries and Information Centers and ASLI could benefit from future collaboration.

KEYWORDS: Atmospheric sciences, information science organizations, Atmospheric Science Librarians International (ASLI), collaboration

I. Introduction

The purpose of this paper is to share the history and activities of the Atmospheric Science Librarians International or ASLI organization. Appropriately presented in the 'Networks' session at the joint Polar Libraries Colloquy (PLC) and International Association of Aquatic and Marine Science Information Centers (IAMSLIC)—the ASLI organization is an information network for information professionals which has evolved over the world's largest network, the Internet.

ASLI is a free and open forum for librarians and information professionals around the world to address issues and exchange information on atmospheric science topics. ASLI is specifically aimed towards librarians and library staff from around the world involved in the atmospheric sciences, but anyone is welcome to join. Membership is free and benefits of membership include participation in the ASLI listserv as well as the opportunity to attend the annual ASLI meeting.

II. The When and How of ASLI's Formation

The idea for ASLI 'brewed' over a cup of coffee in 1994 between Janice Beattie and Carol Watts (of the NOAA Central Library) and Betty Petersen (then of the National Climate Center). These three were discussing the fact that the marine science librarians had IAMSLIC and that atmospheric science librarians could benefit from an organization similar to IAMSLIC. This conversation planted the seeds for the creation of ASLI (Beattie 1998).

With support from Janice & Carol, Betty Petersen began working towards creation of an organization for atmospheric science information professionals. In 1995 she and Janice conducted informal phone and email surveys of several atmospheric libraries where they knew the staff, including the libraries at the U.S. Naval Post Graduate School, Environment Canada and the U.S. Air Force Air Weather Service, among others. In the summer of 1995 Betty visited the World Meteorological Organization and British Meteorological Office libraries, while there she discussed the formation of a new organization for atmospheric science librarians. Interest received from the surveys and visits was unanimous in support of creating an atmospheric science librarians group (Beattie 1998).

With ASLI's momentum on the rise, Judie Triplehorn (Geophysical Institute University of Alaska Fairbanks) began a nine month sabbatical at the NOAA Central Library in the fall of 1995. Part of Judie's work while at NOAA was to work with Betty to establish an international database of atmospheric science libraries. Judie was also tasked with coming up with a 'name' for the fledgling society. Her first choice was the IASL—International Atmospheric Sciences Librarians—however, upon inspection of the *Encyclopedia of Associations* she found that this acronym was already in use by the International Association of School Librarians. So, upon further reflection she coined—Atmospheric Sciences Librarians International or ASLI (Triplehorn 1998).

While Judie and Betty were working on identifying potential ASLI members, discussions regarding the structure of ASLI were taking place. Several ideas were considered such as affiliation with the American Geophysical Union, as well as forming a Special Libraries Association (SLA) Round Table. It was decided however to pursue a structure similar to the Geoscience Information Society, which operates as an independent member Society of the American Geological Institute. The Geoscience Information Society (GIS) holds its meetings at the Geological Society of America annual conference which allows GIS to meet with the researchers and vendors of the field it supports (Beattie 1998). In June of 1996, with the GIS model in mind, Carol Watts and Maria Latyszewskyj (Environment Canada) met with representatives from the American Meteorological Society at the AMS headquarters in Boston, Massachusetts. At the meeting AMS expressed great interest in the formation of ASLI and offered support to the organization in the form of space and equipment at AMS meetings (Latyszewskyj 1998).

While in Boston, Carol and Maria also attended the 1996 Annual SLA Conference, where they advertised for a meeting of the "new ASLI group." This first informal gathering of ASLI was held around a table in the crowded Haines Convention Center with approximately a dozen librarians representing institutions from all over the world. Institutions that were represented at the meeting included: NOAA Central Library; Environment Canada; the United States Air Force Air Weather Service Technical Library; the Geophysical Institute University of Alaska Fairbanks; the Massachusetts Institute of Technology Haystack Observatory; the Consortium for International Earth Science Information Network (CIESIN); the Desert Research Institute; the Pennsylvania State University Earth and Mineral Sciences Library; Oak Ridge National Laboratory, the Goddard Space Flight Center Library and the Global Change Research Information Office. The focus of this meeting was to share information on ASLI and to gather information about potential new members (Latyszewskyj 1998).

A list of participants from this first ASLI meeting in 1996 became the basis of the ASLI listserv. The listserv is the backbone of ASLI. It is the primary means by which ASLI members exchange information. The listserv reflects the true nature of ASLI as a free and open forum for exchange of information between atmospheric science librarians and fosters the ASLI goal to serve information professionals from around the world. From the beginning it has been the goal of all those involved in the creation of the organization that ASLI be international and that membership be affordable to members from any size institution from anywhere in the world. At the same time that the listserv was created an ASLI homepage was also unveiled [Figure 1]. The homepage is the archive for ASLI meeting minutes and also provides a place where people can join ASLI via a membership form [Figure 2].

ASLI hit some rocky weather during the fall and spring of 1997. A major loss was the death of Betty Petersen who was a driving force behind the creation of ASLI. In addition, several other ASLI members faced personal challenges which did not allow them time to concentrate on ASLI. The AMS had extended an offer to host an ASLI meeting at its 1997 annual conference (Seitter 1997). Unfortunately the set-backs which faced several of ASLI's primary members resulted in a dip of ASLI's momentum, so a meeting with the AMS was not able to be coordinated for 1997. In June of 1997 however, another informal meeting of ASLI was held at SLA, this time in Seattle, Washington. This meeting also had approximately a dozen attendees representing Environment Canada; the Goddard Space Flight Center Library; Scripps Institution of Oceanography Library; the Kresge Physical Sciences Library at Dartmouth College; the North Carolina State University Natural Resources Library; the Australian Bureau of Meteorology; the NOAA Seattle Office Library; the University of Washington Natural Sciences Library and Earth Observing System Data and Information System (EOSDIS). In addition, Dr. Keith Seitter from the American Meteorological Society attended the meeting. At this meeting Dr. Seitter gave an update on AMS products including their forthcoming electronic journals as well as information about the Meteorological and Geoastrophysical Abstracts database. Dr. Seitter also reiterated the AMS offer to host an ASLI meeting at the AMS annual meeting (Wishard 1997).

After the Seattle meeting, ASLI's momentum picked up once again. Through the early fall of 1997 Janice, Maria and Lisa Wishard (Penn State University Earth and Mineral Sciences Library) collaborated on a preliminary program for the first 'official' meeting. Janice outlined a preliminary program and Maria and Lisa worked at filling the holes. With the help and patience of the AMS, ASLI's first 'official' meeting was a success. About a dozen librarians, publishers and interested meteorologists met for two and a half days in Phoenix, Arizona. Attendees at the inaugural meeting represented NOAA Central Library; NOAA Boulder Labs; National Center for Atmospheric Research; Desert Research Institute; Environment Canada; NOAA Miami Regional Library; Geophysical Institute University of Alaska Fairbanks; University Consortium for Atmospheric Research; American Meteorological Society, Meteorological and Geoastrophysical Abstracts; German Military Geophysical Office; Kluwer Academic Publisher and the Penn State University Earth & Mineral Sciences Library. The program included presentations from the World Meteorological Organization, the National Climatic Data Center, and a demonstration of the NOAAServer, among others. The were profiles about programs sponsored by the World Data Center-A for Oceanography as well as the U.S. National Center for Environmental Prediction. In addition there were also presentations about the archives for arctic data, electronic journals, meta-data issues and site-licenses. One of the most successful sessions was the ASLI round-robin where attendees shared information about their libraries, collections, and services. The meeting also included an ASLI booth and a chance to meet vendors, publishers and scientists from all over the world. Several attendees also took a field trip to Tucson, Arizona to visit the University of Arizona Atmospheric Sciences Library and the Biosphere 2 ecological laboratory (Wishard 1998).

The meetings and history described in this paper have contributed to the development of a solid core for ASLI. Each year enthusiasm and participation in the organization grows. Plans are well underway for a program at the AMS meeting in January of 1999 and there are preliminary plans for ASLI to participate in the GeoInformation VII conference in Canberra, Australia in 2002.

III. ASLI Uniqueness

ASLI serves a unique scientific information niche. Similar to the Polar Libraries Colloquy (PLC), IAMSLIC and GIS the resources and needs of the researchers, students, and enthusiasts that ASLI serves are unique. Success in atmospheric science librarianship depends heavily on the ability to know where to find, how to acquire, and how to deliver a wide variety of meteorological and climatological information and data. Many of the bibliographic tools used in atmospheric sciences are very specialized—for example there are less than 300 subscribers to the Meteorological and Geoastrophysical Abstracts database which is the primary bibliographic database for the atmospheric sciences. In addition a lot of the information and data for atmospheric sciences are not found in traditional library sources—often they can only be found in unpublished observation logs and obscure publications from long-gone observatories and societies. In this era of digital information, keeping track of what information center is gathering hourly data on temperature, and who has historic snowfall records (historic sometimes being only 1993) requires familiarity with cutting-edge search engines and searching skills—as well as knowledge of people and collections. These are challenges that many of the members of PLC and IAMSLIC have also faced. An example is the challenge of getting data about the 30 year average relative humidity of Badulla, Sri Lanka into the hands of a researcher who has to get his/her grant proposal in yesterday. The networks and knowledgeable colleagues, upon whom you can call when faced with situations like the one described, that are established in specialized societies like ASLI, contribute to the value of the societies as well as our ability to successfully locate the in information and resources that are needed to help researchers unlock the mysteries of the earth.

ASLI is also unique in that virtually all of its growth in membership and content has occurred electronically. Membership has grown steadily since the listserv was started in 1996. There were approximately 30 members that originally subscribed to the ASLI listserv (NOAA Central Library 1996). Today membership has more than tripled to 100 members (Edstrom 1998). The international reach of ASLI has also continued to spread across the globe with over a quarter of ASLI membership residing in Europe, Asia, Canada and Oceania [Figure 3]. In addition to the growth in membership, the traffic on the ASLI listserv has also seen steady growth. Traffic has increased from only 8 posts in 1996, 50 posts in 1997 to well over 60 posts to-date for 1998 (Edstrom 1998). As listserv membership grows so too do the energy and accomplishments of ASLI. Email, phone and fax provide electronic structure for the organization. Nearly all of the planning and communicating for the annual gatherings of ASLI have been done electronically. This electronic precedent continues with a proposed distance learning session to be delivered by video conference during the ASLI program in January 1999.

IV. Collaborative Opportunities

There are many areas in which PLC, IAMSLIC and ASLI can collaborate not only to promote the goals and objectives of each organization but also to affect change in issues related to earth science data and information. An obvious area for collaboration is to establish liaisons between the organizations in order to share information about projects and accomplishments. Another way to promote information sharing between the organizations is to consider future joint meetings or joint participation in an established meeting such as the quadrennial GeoInformation meeting. PLC, IAMSLIC and ASLI could also collaborate on continued development of guides to data such as the Arctic Environmental Data Directory or Oceanography on the Net that both contain climatological information. By establishing contacts with additional atmospheric science information centers through ASLI, both of these existing data collections could potentially strengthen their coverage of climatological and meteorological data. Also, many of the publications and products used by PLC, IAMSLIC and ASLI member institutions are produced for small, specialized markets and are often not priced or licensed appropriately. If the membership of all three organizations negotiated collectively, vendors and publishers may be more likely to adopt more appropriate product pricing and licensing practices. These are just a few of the many opportunities for PLC, IAMSLIC and ASLI to collaborate. While each organization has separate identities and goals there is a common goal to not only help preserve but also provide access to earth science information.

V. Summary

ASLI's membership continues to grow and as it grows ASLI will need to incorporate and establish financial footing. To date ASLI's activities have been supported by the NOAA Central Library, the institutions of ASLI members and the AMS. ASLI recognizes, however, that in order to succeed it must establish a financial base and a formal organization structure. It is time for the organization to establish funding to better promote its goals of providing support and sharing information between and among atmospheric science librarians. At the 1998 meeting the WMO expressed interest in providing travel support for a WMO member institution librarian to attend a future ASLI meeting. AMS continues to offer space and equipment for ASLI meetings. But in order for ASLI to be able to complete projects (such as a directory of world atmospheric science libraries or a union list of WMO publications), or to participate in beneficial joint meetings (like the joint PLC/IAMSLIC meeting) ASLI will need to establish bylaws and a financial infrastructure. This is a big goal that can only be reached with the hard work and dedication of atmospheric science information professionals from around the world working together.

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ALASKA RESOURCES LIBRARY AND INFORMATION SERVICES

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ABSTRACT: At the 1996 Colloquy, a poster reported on a multi-year effort to combine a number of special libraries in Anchorage, Alaska, into a single library. We are happy to report that the project is a smashing success. The Alaska Resources Libraries and Information Services opened its doors to the public in October 1997, offering the cultural and natural resources collections of nine separate agency libraries. This paper focuses on the non-technical problems involved in establishing this library. It addresses some of the political, administrative, and just plain people problems we encountered, and it discusses what turned out to be a problem and how we overcame (or got around) it, what worked for us and why, and what did not work. Many of the technical problems related to actually merging the collections have not yet been overcome, but three of the collections have been merged and all are in a single, very nice location, and everything can be found.

We believe our experiences can be of help to those of you who find yourselves with a similar opportunity.

KEYWORDS: Alaska Resources Library and Information Services; Library consolidation; Partnerships; Library Management; Alaska; Teams

Introduction: At the last Polar Libraries Colloquy, Juli Braund-Allen (1997) described a multi-year effort to merge nine individual natural and cultural resources libraries into a single library. This effort was undertaken to safeguard and maintain their collections and services for users in Alaska. The partnership involved the Alaska Department of Fish and Game (Habitat Library), the *Exxon Valdez* Oil Spill Trustee Council (Oil Spill Public Information Center), the U.S. Bureau of Land Management (Alaska Resources Library), the U.S. Fish and Wildlife Service (FWS Library), the U. S. Geological Survey (USGS Library), the U.S. Minerals Management Service (MMS Library), the U.S. National Park Service (NPS Collection), and the University of Alaska Anchorage (including the Consortium Library, as well as the Environment and Natural Resource Institute's Arctic Environmental Information and Data Center).

We are happy to report that the project is a huge success. The Alaska Resources Library and Information Services (ARLIS) opened in Anchorage, Alaska, in October 1997 in a roomy and attractive setting. It contains nine formerly separate collections in one integrated facility. Three collections are already merged; three others are shelved separately, but electronically integrated in the online catalog; and another three collections, which had never been automated, are in the process of being merged. Within the next two years, all of the collections will be seamlessly merged into a major northern resources library, serving resource management agencies, Native corporations, private industry, and the general public of Alaska.

This paper discusses lessons learned in the creation of this new library. Its actual genesis occurred within the working rank and file rather than at a high management level. Because of this, the library's establishment involved a far different process than would have occurred in a top- down decision to merge collections, where the focus would have been on the physical and technical aspects of the merger. The creation of ARLIS was conceived of and largely accomplished by the librarians, and the lessons discussed here deal mainly with the political and financial problems involved in carrying it off.

To begin at the beginning: by the spring of 1995, governmental downsizing had reduced the number of staff of most libraries serving natural resource agencies in Anchorage to bare bones. In fact, one library had actually been closed and its collection boxed and moved into storage. The probability of further cut-backs galvanized Anchorage librarians into action.

Their commitment to maintaining and preserving these collections in Anchorage was based on the shared knowledge of how extremely poor Alaska is in library resources. All of the books in all of the libraries in Alaska equal fewer than half the number in the library collections of Stanford University. Moreover, Alaska librarians had depended upon one another and collaborated for more than a decade to reduce unnecessary duplication between local collections, thus stretching available dollars as far as possible. What this now meant was that the loss of any one collection constituted a significant loss to every other library. There were no other sources for many of the materials in the collections threatened with closure.

Why it worked: The factors of success can be summed up in three words: blood, sweat and luck. Alaska's economy is almost exclusively related to the development and protection of its natural resources. Federal and state agencies that manage most of Alaska's resources are headquartered in Anchorage, and the libraries in the coalition were all involved in supporting resource management. The loss of any of the collections could have significant impact on the ability to make wise decisions concerning resource management -- the life blood of Alaska's economy.

To develop, justify, and implement this project, the librarians involved met weekly for the entire morning for two years. During that time every one of them devoted more than forty hours a week for some periods in order to accomplish specific special projects necessary for the merger -- all this while trying to maintain services at their home libraries.

The luck factor came under the heading of timing. First, federal agencies had undergone serious downsizing for several years, and state agencies were now beginning to face the same problems. Every agency manager was desperate for an innovative way to save money. Second, all of this came about at the time Alaska had become a force in the U.S. Congress. Committee chairs in Congress are decided by seniority, and Alaska had re-elected its Congressmen repeatedly. In spite of having the minimum number of Congressmen (three), Alaskans held the chair of both the House and Senate Natural Resources Committees, and our senior Senator was chair of the powerful Appropriations Committee -- the one that decides where federal funds are spent. And while this didn't necessarily guarantee funding, it certainly held the attention of the various agencies we dealt with. Finally, for several years Vice President Gore had been building a program called "Reinventing Government" within federal agencies. Each department had programs to assist groups looking for innovative ways to function. Our project received a special "laboratory status," one of only a few hundred in the whole country. This designation provided us with special training and mentorship from the Washington, D.C., office of the U.S. Secretary of the Interior. It gave us a presence and voice that was listened to.

One more critical factor in our success was the commitment of the librarians to preserving all of the libraries by merging them into one. This commitment was so strong that each was willing to accept a completely new and unknown form of organization. In addition, most had to come to grips with giving up the autonomy of a one-person library for an unknown management structure.
These were profound and difficult changes for all involved.

How it worked: The first major hurdle for the librarians was to get the attention of their managers. This meant employing both a direct and logical approach, as well as the appeal of users. Because one agency with important collections, the U.S. Bureau of Mines, had just been shut down, Alaskan miners had already gotten the attention of our Congressional delegation. Since our project would preserve the collections the miners were afraid of losing, we were able to use their concerns to our advantage. Agency managers were forced to at least listen to our plan and reasoning. The did so, some with great skepticism.

Our argument of saving the resources -- the collections -- to serve the agencies in Alaska was primary, and the merger of the collections into one large library made sense because the libraries involved all focused on resource management. A single, larger collection would be more efficient. Users would be able to find everything in one place. It would also allow combined staffing to provide services that an overworked one-person library could not provide.

Taking advantage of the national impetus to streamline government in innovative ways, we applied for and were named a Reinvention Laboratory. This federal program was critical to our success. We were trained, particularly in how to work as a team; we were required to do several important things that we might otherwise have neglected, such as conducting user surveys and forming a senior advisory group; and we received support from the Washington, D.C., headquarters.

Training included the Myers/Briggs personality analysis for each member of the team. The results were tabulated, and we analyzed what this meant to the team as a whole. Everyone brought different strengths to the team, and everyone had weak areas. By looking at the team as a whole, we were able to take advantage of our strengths and cover our weaknesses in selling and garnering support for the project. Discussions of the implications of the test results helped us understand each other, as well. This made it easier for us to work together as we thrashed out issues and brainstormed ways to make the project succeed.

Forming a Management Advisory Group (MAG) is required of Reinvention Laboratories, and it was probably the most important step we took. In determining who should be invited to be on the MAG, we were advised by our trainers from Washington, D.C., to "follow the money." They pointed out that we only had to sell the project to a handful of decision makers -- those who would be funding the coalition, namely, our own managers. So our MAG consisted of the top managers of each of the agencies of the libraries in the proposed coalition. Since most of the agencies were federal, and since we were a federal Reinvention Laboratory, they were inclined to accept our invitation to serve on the MAG.

We learned one trick with our MAG. The meetings were in the afternoon, and to keep the sessions from dragging, we provided a variety of expensive cookies and soft drinks at the meetings. Their blood sugar stayed high and we never lost their interest.

Finally, every decision we made was unanimous. The project worked by consensus. This may sound utopian, but we had no choice. Any library or any agency, could pull out at any time. Each librarian and each agency had distinct perspectives and concerns, and we had to satisfy these before we could move on.

Problems: As you can imagine, reaching a unanimous decision was often a problem. However, through in-depth, sometimes very heated discussions we eventually managed to reach consensus. Many times as we talked a matter over, we found that we were already in agreement -- we just voiced our solution in different terms.

There were, however, some problems that took a very long time to solve. We found that by approaching particularly thorny issues slowly, we could whittle away at them. We would focus on the issue during a meeting and usually find some areas of agreement before the discussion became too heated. Then, by skipping the subject at the next several meetings, we had time to discuss the problem with each other, individually and less heatedly. The next time the topic came up there were a few more areas we could agree on, and eventually the problem was reduced to a practical solution.

Two issues in particular -- the new library's circulation policy and the new library's name -- could not have been solved without bloodshed had we not used this method of kneading and resting. We were merging libraries with circulation policies that ranged from one extreme to another. One agency did not circulate outside its own staff, another circulated to anyone anywhere, and the rest were somewhere in between. Coming up with a rational circulation policy took a number of months. Eventually we developed a hierarchy of materials, as well as users, with different borrowing privileges for each. The policy is not simple, but it is logical, and it seems to be working.

Probably the hardest problem was the choice of a name. This caused real heartburn during a number of meetings. The trouble was there was some concern that if we did not come up with a completely new name, it would appear that one library had swallowed up the others. Further, we wanted to find something descriptive, with an acronym that was not already taken. And we wanted to please everyone! We had planned to give the MAG two or three choices and let them decide, but in the end the librarians could only agree on one name, ARLIS. We simply asked the MAG to approve it -- and they did.

Future plans and possibilities: We expect ARLIS to be a completely merged library within the next year or two. We hope to get federal legislation allowing us to collect fees for special services to non-supporting users. In this way, the costs of the resources would be more equitably shared, and all users would have access to our particular areas of expertise. We also expect to digitize many of the holdings to make them more accessible for resource managers throughout Alaska. ARLIS is fortunate in that its most important materials are unique resources produced by governmental agencies and are not covered by copyright. Finally, because of its focus on Alaska resources, ARLIS is a prime candidate for membership in the Polar Libraries Colloquy.

Conclusion: For any of you who may be faced with such an opportunity as we were, remember to involve your management from the very beginning. This kind of project will take much more time and effort than you can imagine, but if it works, it is worth it. We wish anyone undertaking such a project as much success as we have had.

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IF TARZAN COULD DO IT, SO CAN YOU: A PRACTICAL AND POSITIVE APPROACH TO READING MORE OF THOSE POLAR AND SUB-POLAR LANGUAGES

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ABSTRACT: "The archive past" that we are reminded not to forget includes journals, books and other written material in languages that we do not yet know, or hardly so. From experience I point out some ways in to reading them, ways that are open to all.

KEYWORDS: Languages, grammars, dictionaries, archives, libraries

Tarzan - Lord Greystoke - is a fine example to those of us who wish to dabble in languages. He taught himself to read from the children's books in his cabin, and later learnt to speak several languages, including Latin in a fortnight.

I am interested in reading languages, particularly those that we get in Polar libraries. My examples are taken from Norwegian and Finnish - one that is very like English, and of course similar in its structure to other Indo-European languages, the other from a different family but usually expressing the same ideas from a common culture. I shall give some examples at the end.

A very useful start is using parallel texts (see examples), which may mean just titles or captions to illustrations, or it may mean studying an article that has abstracts in two languages. It may be a whole book in two language versions. Of course the New Testament is excellent for this, and the new language can throw new light on a passage. We get useful bilingual weather reports from Sweden and Finland at the Scott Polar. References at the end of an article and the contents of verbal tables will often give clues to the article's themes. They may even refer to the same article in another language. Culture-bound words are another fascination of reading foreign languages, and we can spend hours browsing in a dictionary, finding out customs and special interests - I think of reindeer herding here, but the list includes fishing, graduation, cooking, marriage celebrations and so on. The problem with some of these is finding a good translation, even when we understand what is written.

Starting off, the big problem is vocabulary. It takes time to get to know the major part of a sentence without looking up, but when we get there we have made the first breakthrough. This is where short things like titles and captions come to our aid. For translation, and for precision, we have eventually to get to grips with grammar, but not all at once. Beware of irony or ways of negating that are not just "no", or in Finnish the "verb of negation". Idioms are fascinating, and often guessable.

Our own knowledge of the subject matter is an enormous help. We can guess the theme, the things that are likely to be said about it, and if it is on a scientific or environmental topic, we can even recognise many of the words. But beware: "also" in German does not mean the same as in English.

Although Finnish is in a different language family, its verb forms are quite like Latin or French "-imus - -emme" and "-itis - -ette". Where English and French use "-s" in the plural, Scandinavian languages have "-r" and Finnish has "-t".

Scandinavian and Finnish follow the German habit of combining words. You will have found many examples in Reykjavík. The problem is to know where to break them. Usually the first, or all but the last words in a multiple compound, have not been changed much. Not all compound words are long: "polisen" in Norwegian breaks as: "pol is en", "polar ice the". (Breaks are shown in the examples by "/".)

Some words just need a lot of looking up. Sometimes I find myself looking up for the third time a word (usually abstract) that I first met ten minutes ago. It helps to have written the translation, however ungrammatical, but we can't always predict such mental blanks.

Key passages, if we can recognise them, will often save looking so closely at other passages, unless we are aiming at translating the whole thing. Anyone with abstracting experience will have developed a sixth sense in this direction, and will usually be right! Proper names can be a guide to the subject matter. At the start of a sentence, they may waste a lot of time as we try to look them up. Most of the languages that we are trying to read use capitals less than English does. Even book (committee, publishers') titles may have only the first word in capitals.

Prefixes, prepositions and postpositions (yes, they exist too) can convey important aspects of meaning, and prefixes can change the meaning drastically. Usually we can get the main effect of such items, but nothing is more idiomatic than a language's use of "in", "with", "at" or foreign (supposed) equivalents.

I call my next topic self contradictions. Norwegian "nedlegge" or "slå" mean so many things, that we need to spend some time choosing the right one, out of so many apparently contradictory meanings. At least we shall meet these words a lot.

Text books, readers, grammars, dictionaries. Of course, the more of these the better. I have found a book How to Read German, and there may be others like it. The bigger and more complete the dictionary that we use, the less frustrated we will be. I find Berlitz's little dictionaries very helpful at the beginning, as they give the common words, and save

plunging into the big one all the time. I have used the Teach Yourself books for reference a lot. The newer editions tend to go more for speaking the language, and are not so easy to use in this way. I can give the titles of those I use for particular languages via e-mail: jlgp101@cus.cam.ac.uk. That means Greenlandic, Icelandic, Norwegian, Swedish, Saami, Finnish, Polish, German, Dutch, French, Italian and Spanish. I don't claim expertise in these, but I have wrestled with all of them in the ways mentioned above, using both dictionaries and grammars, and can manage half of them quickly.
I end as I intend to finish the talk: with Queen Victoria, a real person, who set out at the age of sixty eight to learn Hindustani/Urdu, and made good progress, besides making very loyal friends of her "munshis."

Examples

grauta í málum = dabble in languages - Ic
juuri/kaas = root gas (welding); juuri/kas = beetroot - Fi
oudasta kulkijasta ihmiseksi - (26 letters, 11 syllables)
= from a wandering stranger to a human being - (35 letters, 13 syllables) - Fi
Rauman-Kokemäen seudun maa/perä = Deposits in the Rauma and Kokemäki map-sheet areas - Fi
Isoja hirvaita vai/ko urakoita poron/hoidessa? - Fi
= Stor/bukk eller små/bukk i rein/drifta? - No
= Large or small bulls in reindeer herding?
"Ohoh seppo Ilmarinen! Taos rautaiset talukset, Tao rauta/rukkahiset, Paita rautainen rakenna!"
= "Smith Ilmarinen forge iron footwear forge iron gauntlets make an iron shirt!"
(from the Kalevala) - Fi
Touko/kou alussa vallitsi hyvin lämmin, loppu/puolella viileä sää
= The weather was very warm at the end of May, but cool at the end of the month - Fi
Trekk og over/vintring hos norske makrell- og rod/nebb/terner
= Migration and over-wintering among Norwegian common and Arctic terns - No
Svalbard - Vårt nordligste Norge = Svalbard - Our northernmost Norway - No
Seismisk aktivitet og fiske/fangster - Analyse av innsamlede fangst/data
= Seismic activity and fish-catchers - Analysis of collected catch data
Går under pol/is/en med atom-ubåt = Goes under the Polar ice in nuclear submarine

COLLABORATING WITH THE COLD REGIONS BIBLIOGRAPHY PROJECT: THE *SPRI* EXPERIENCE

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Abstract: The Scott Polar Research Institute Library has been contributing Antarctic records to the Cold Regions Bibliography Project since 1996. The rationale of the collaboration project is outlined in the context of increasing coverage and reducing duplicate indexing. Although the different requirements of the CRBP and SPRI databases have been seen as a barrier to the sharing of records, a low-tech solution based on word-processing software has been used to adapt records created for CRBP to fit the SPRI format. The in-house advantages to both organizations will be assessed, as well as the implications for future collaboration projects.

It has long been acknowledged that there is considerable overlap of interests between the Antarctic Bibliography produced by the Cold Regions Bibliography Project (CRBP) at the Library of Congress in Washington, and the Antarctic material catalogued by the Library of the Scott Polar Research Institute (SPRI) in Cambridge (Thuronyi & Galpin 1988). Although there is a history of collaboration projects between the two organisations, I will discuss only the specific project in which I was involved, which could be seen as a prototype for other collaborations where one main "host" database does most of the cataloguing, assisted by contributions from other libraries.

After discussions between the two organisations in 1994, it was agreed that SPRI would contribute records from non-English language journals to the Antarctic Bibliography using the CRBP format. The project had advantages for both organisations. Quite apart from practical assistance with time-consuming entries which would bring about cost savings for their sponsors, the Antarctic Bibliography hoped to increase its coverage of non-polar and non-English language journals using some of SPRI's resources. For its part, SPRI gained on-line access to the COLD database at a time when it was not generally accessible via the Internet, and was able to greatly reduce duplicate cataloguing of journals and offprints. Both organisations benefited from being seen to be trying something new.

Although I am the Antarctic Bibliographer at SPRI, I am a linguist rather than a librarian, and this influenced the type of journals which SPRI chose to input. The Scott Polar Research Institute Library has a large collection of Russian language materials, and of more than 15,000 Russian language items in the database, over 1,000 are about

Antarctica. We have catalogued articles on Antarctica and the Southern Ocean from 36 Russian language journals, ranging from *Antarktika* and *Materialy Glyatsiologicheskikh Issledovaniya* to less expected titles such as *Morskoy Flot* and *Priroda*. However, over the last few years some of the relatively high-yield Russian journals have become difficult to obtain. We therefore selected *Russkaya Antarkticheskaya Ekspeditsiya. Informatsionnyy Byulleten'* and *Antarktika* as the basis for SPRI's contribution to the Antarctic Bibliography since both titles have continued to appear fairly regularly. I should point out at this early stage that cataloguing these journals can be quite time consuming, for example, articles in *Informatsionnyy Byulleten'* do not have author abstracts.

Having selected the titles I was to catalogue, my next task was to learn to work with the CRBP database (COLD), which uses the *STAR* system as opposed to the *Muscat* used at SPRI. The differences between database systems have often been seen as a barrier to sharing records. Some of these differences arise from the fact that not all databases have the same purpose, while other differences are of a more mechanical nature.

The SPRI database is basically a catalogue of what is available in the Library. The abstracts are short and indicative, there are no entries for author affiliations, but all entries have a shelf location. When users find an item of interest they can go straight to the journal and read the article in question. COLD on the other hand is a bibliography rather than a catalogue, and as such has different requirements. The abstracts in COLD are longer and substantive, and the author affiliation is given. These are obviously important features when users do not necessarily have immediate access to the full text of an article.

The mechanical differences between the SPRI and COLD databases are more problematic. Their different purposes (catalogue vs. bibliography) mean that the databases require different information, so each has fields that have no equivalent in the other. SPRI and COLD use different field tags for the same information; for example, the author is given at ***a** in SPRI and at **NAME** in COLD. The systems used for transliterating Russian are different, as are the codes for entering diacritics. Another major difference is that whereas SPRI indexes using UDC numbers (to which the system automatically adds key words) and can add Linnean terms, COLD uses key words selected from a list. Table 1 shows some examples of the various differences.

Table 1. Examples of some differences between SPRI and COLD

<table>
<tr><th>SPRI</th><th>COLD</th></tr>
<tr><td>Different information</td><td></td></tr>
<tr><td>*loc [shelf location]</td><td>AUAFF [author affiliation]</td></tr>
<tr><td>*size [in cm]</td><td>REF [number of references]</td></tr>
<tr><td>Different field tags</td><td></td></tr>
<tr><td>*a [author's name]</td><td>NAME</td></tr>
<tr><td>*k [indexing terms]</td><td>SUBAN</td></tr>
<tr><td>Transliteration and diacritics</td><td></td></tr>
<tr><td>Byulleten'</td><td>Biulleten</td></tr>
<tr><td>Teshebayev/Yegor B.</td><td>Teshebaev, E.B.</td></tr>
<tr><td>rayon</td><td>ra^D&ion</td></tr>
<tr><td>\vAkademik Fedorov\n</td><td>^IAkademik Fedorov^R</td></tr>
<tr><td>UDC numbers + keywords</td><td>Key words</td></tr>
<tr><td>[for the breeding behaviour of Adelie penguins]</td><td></td></tr>
<tr><td>598.2 Birds</td><td>Aves |b Sphenisciformes |c Behavior</td></tr>
<tr><td>598.45 Penguins [Pygoscelis adeliae]</td><td>Aves |b Sphenisciformes |c Breeding cycles and reproduction</td></tr>
<tr><td>591.5 Animal behaviour</td><td></td></tr>
<tr><td>591.551 Animals, breeding behaviour</td><td></td></tr>
</table>

The initial intention was that I should add records to the COLD database on-line. However, this did not prove to be a practical proposition, as the Internet connection invariably experienced hiccups. Even a short waiting time half-way through entering an author's name was difficult to cope with, and having the connection timed out sometimes meant that an entire abstract was lost. That method of working was soon abandoned.

Eventually COLD came up with a method for loading a batch of records from a word processor file. My next step was therefore to make a COLD template for the journal articles I would be entering. There are 43 possible fields in COLD, but I was pleased to find that the COLD template for *Antarktika* only requires 31 of these. (I was slightly less pleased when I compared this with the 13 fields required by SPRI for the same journal template!). The disadvantage of batch loading was that the records had to be checked individually at COLD. However, the method worked well enough and over the past two years I have contributed records for both *Antarktika* and the *Informatsionnyy Byulleten'*.

As I mentioned earlier, these particular journal entries can be very time consuming, and I was sometimes spending up to 30 or 40 minutes to complete a record in the COLD format. However, none of this work showed up in the SPRI database. I therefore started to look at ways of converting the records I was producing for COLD into the SPRI format.

Having checked that COLD was not sensitive to the order in which the fields were presented, the first step was to rearrange the COLD field tags to match the SPRI format, and to move to the end of the template the 18 COLD fields that were not needed in SPRI. Once a batch of records had been sent to COLD, these surplus fields were removed from the word processor file with a quick *click, drag, and delete*. This left a record which contained only the information which SPRI wanted, in the order it wanted it.

The next step was to change the field tags from COLD (e.g. NAME) to SPRI (*a) format. This required eight *find & replace* commands, which also covered other minor adjustments such as pagination. Changing the transliteration system and the diacritics took a further eleven *find & replace* commands. (Though these created a number of spelling errors, they were all picked up by the spell checker.) Thus with a block deletion and 19 find & replace commands, a record created in the COLD format could be converted for loading into the SPRI database.

The process was obviously very labour intensive. In fact it took about 40 minutes to carry out all these steps. If the procedure had converted just one record, it would not even have been worth considering. However, using *find & replace all* with 20 records in one word processor file, the time per record is reduced to about 2 minutes, which makes it a more viable proposition.

Even after all these changes, the conversion was still not complete. The remaining alterations involved the punctuation of the author's name, entering UDC numbers and assigning the entry to a main subject category. These had to be done individually and brought the time spent per record to something over 5 minutes. It was felt that the conversion exercise was only a semi-viable option, possible only for time consuming records such as those from *Antarktika* and the *Informatsionnyy Byulleten'* where it represented between 13% and 17% of the time spent creating the original record.

To speed up the conversion process, the next step will be to use macros or bibliographic software to make the necessary changes. However, it will still be quite a lengthy procedure, and though there is software which deals very well with different ways of entering the author's name, changes involving key words, UDC numbers, and main subject headings will still need to be made individually for each record.

Contributing records to the Antarctic Bibliography was, however, only one part of the collaboration project. The two other aims of the project were to reduce duplication of cataloguing effort; and to increase coverage.

SPRI receives 85 journals whose high yield of Antarctic articles has put them on the list of journals which are systematically monitored by COLD. Together they yield an average of 450 Antarctic articles every year, all of which are given full entries in the Antarctic Bibliography. Knowing that they are already taken care of, for the past three years SPRI has not been making catalogue entries for Antarctic articles in these journals, though the journals are available in the Library. A quick calculation shows that by cutting out duplicated cataloguing effort of between 15 and 20 minutes per article, SPRI has saved between 112 and 150 hours per year.

A similar effort has been made to reduce duplication in cataloguing offprints. 74% of Antarctic offprints received at SPRI are given full entries in the Antarctic Bibliography. Though these offprints are entered in the SPRI database they do not get an abstract, and this can save about 10 minutes per offprint. As there are on average 180 items in this category every year, this has resulted in a saving of approximately 30 hours at SPRI.

Thus the time saved at SPRI by reducing duplicated cataloguing effort is approaching 180 hours per year, which is the equivalent of approximately 23 full working days.

Of the 26% of SPRI offprints which did not appear in the Antarctic Bibliography, 10% were outside COLD's interests, many of these relating to the Falkland Islands. However, the remaining 16% had been missed by COLD, and this brings us to the third aim of the collaboration project; increasing coverage of Antarctic material.

A recent study of the Antarctic Bibliography (Hibben, 1997) estimated that whereas coverage of polar journals was almost 100%, between 15%-18% of articles in non-polar English language journals were missed, as were approximately 36% of Antarctic items in non-English language journals. Some of the time saved at SPRI by not duplicating cataloguing effort was used firstly to notify COLD of the items I knew it was missing, and secondly to increase coverage of non-English language material and grey literature.

As journals and offprints came into the SPRI Library I used lists of journals monitored by COLD, supplemented by data on the number of hits and the date of the most recent hit, to identify items likely to be missed. Over a three-year period, SPRI notified COLD of 364 such items, increasing from 79 in 1996 to 118 in 1997 and 167 in the first eight months of 1998.

The number of items we were finding for COLD increased as our own coverage of some less obvious sources of Antarctic material improved. These included grey literature, such as internal reports on sub-Antarctic islands from the New Zealand Department of Conservation, and Australian Geological Survey Organisation reports on marine geology in the Southern Ocean. We also traced a number of publications from the Deutsche Geodätische Kommission that had been missed, as well as several papers published in

French language journals by members of the Laboratoire de Paleobotanique du Mesozoique.

Although these are just a few examples of the kind of Antarctic material we were able to capture, I should add that increasing coverage is not just an aim in itself, but important for the researchers who use our databases, and tend to regard them as even more comprehensive than they could ever claim to be. If duplication of cataloguing effort is seen as less than optimum use of time, how much more so is duplicated research.

To finish off this account of a collaboration project, I would like to point to ways in which collaboration could perhaps be made easier. There are probably between 2,300 and 3,000 articles on Antarctica published in one form or another every year, and though it is not a vast undertaking to capture them all in a bibliographic database, funding for such projects is unlikely to increase. Collaboration is therefore likely to become more rather than less desirable, in spite of the difficulties I have mentioned.

Assuming a similar model were to be started from scratch, i.e., most of the cataloguing is done by a main "host" database, with some assistance from other libraries or institutions, collaboration would, I feel, be easier if:

1. the host database were capable of accommodating a wide variety of record formats with relatively minor editing;

2. the host database could allow both checking and loading of records in batches;

3. the contributing organisation could choose between two methods of record contribution:
   a) using the host database template to create records in the host's own format, or
   b) contributing records created in its own database, for the host to convert.

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CATALOGING RETROSPECTIVE CONVERSION PROJECT AT THE GOLDTHWAIT POLAR LIBRARY AND THE OHIO STATE UNIVERSITY LIBRARIES

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ABSTRACT: In 1996 the Byrd Polar Research Center at The Ohio State University completed an internal and external review. The review committee strongly recommended that the Goldthwait Polar Library's (GPL) holdings be added to the online catalog of the Ohio State University Libraries to allow for more accessibility of the collections. The Ohio State University Libraries is a member of OhioLINK. OhioLINK is a network of Ohio academic libraries that share online central catalog resources and provides document delivery of materials to member libraries. Working with the technical services department of OSU Libraries a strategy for this project was completed. The cataloging retrospective conversion project began in earnest in 1997. The GPL began to update item records in the online catalog, beginning with the main stacks. This paper is an overview of the project, and will discuss the changes in procedures and services in the library with the completion of the project.

KEYWORDS: cataloging; academic libraries, online catalogs; library networks; OhioLINK; Goldthwait Polar Library; Ohio State University Libraries

Background Information

The Goldthwait Polar Library (GPL) was established in 1969 with the donation of Dr. Richard P. Goldthwait's personal polar library to the Institute of Polar Studies. More donations from other members of the Institute followed. A small budget was allocated for serials and new acquisitions. In the beginning, the holdings were not cataloged using any classification system. They were just on shelves for members of the Institute to use. Over the years the library has seen many transitions in cataloging procedures. Crudely typed catalog cards that contained only basic information were made. Then cards were produced on a word processing system (not a personal computer) using AACR2 and LC classification. The official card catalog closed in 1990 and up until this year a shelf list file was produced using WordPerfect on a PC. The library's holdings were added to the first edition of *PolarPac*. The library did not continue to add holdings to the database because of budget constraints.

In 1996 the Byrd Polar Research Center completed an internal and external review. While the library received high marks for service and for the resources available in the library, the external review committee strongly recommended that the library's holdings be made more accessible to the OSU community and the polar research community. With this recommendation in mind, the director of the Center and the librarian met with the assistant director of Technical Services and the director of the Ohio State University Libraries (OSUL) to determine how to implement this project. OSU Libraries has successfully completed several cataloging retrospective conversion projects for other libraries that were not actually department libraries of OSUL. They knew what needed to be done. They agreed to work with the Byrd Center to add the holdings to their online catalog, OSCAR. The cataloging retrospective conversion project began in earnest in 1997.

The Agreement

The Ohio State University Libraries is one of the founding members of OhioLINK and a member of OCLC. OhioLINK is a network of Ohio academic libraries that share an on-line central catalog and electronic resources. The OhioLINK network provides document delivery of materials to member libraries. OSU Libraries maintains their own online public access catalog, OSCAR (http://www.lib.ohio-state.edu), but they also are a major contributor to the OhioLINK central catalog (http://www.ohiolink.edu). Over 50 libraries throughout the state of Ohio participate in the network. OhioLINK supports cross-institutional patron initiated borrowing of materials. Document delivery of requested items is handled by the owning institution and the material is usually delivered to the library user within three days time. The network maintains over 60 electronic research databases, such as *Periodical Abstracts* and *Biological Abstracts*. They maintain an online electronic journal site. These shared resources decrease the cost for individual libraries while allowing users to select from a wider variety of information resources. For more information about OhioLINK read Hawks (1992) and Kohl (1997). They discuss in detail the rationale for providing these services to Ohio library users and the how the network functions.

By adding the GPL's holdings to OSU Libraries online catalog, the GPL in essence agreed to also share its monographic holdings with OhioLINK member patrons, with very few exceptions. Some of the material in the GPL was donated by Byrd Center members with the understanding that the material would always be available in the library when needed, or in the worst case scenario, in someone's office down the hall. This donated material may or may not circulate at the donor's discretion. The serials will not circulate. We have agreed to photocopy for free any articles requested by OhioLINK members. The reprint collection in the library will not be added to OSCAR but will remain as an internal resource for BPRC members and other library users who are aware of its existence. The library also agreed to have regular set hours during the week so that the library is accessible to anyone on campus. We agreed to follow the circulation procedures and policies of the OSU Libraries.

Technical Process of the Project

The actual technical process of the project was made possible because of the considerable investment on the part of OSU Libraries. OSU Libraries donated computer equipment and their valuable technical support and expertise to the project. They provided the GPL with a new computer that allowed for both staff access and patron access. The new computer came equipped with a barcode scanner and the GPL received barcodes to attach to all of their monographic holdings. Several days of training were needed to acquaint the librarian with how to update records in the staff version of the online catalog. There were many rules and regulations regarding the updating of records, such as assigning copy numbers, call numbers and cutter parsing. To expedite this process we decided to begin by updating only the titles that had exact matches.

All of the book covers were discarded and then barcodes were attached to each individual book. Using the shelf list as the authority and handling each book, the titles are searched for matching records in OSCAR. If there is not a match, the book is tagged with a pink slip and returned to the shelf. If there is an exact match, the record is updated to reflect another copy. If the call number is different, this information is included in the record. Because the library is adding only duplicate titles at this time, no matter what copy number we assigned to a particular book, the copy will always be a copy 2 or more in OSCAR. We must rely on the barcode as the unique identifier since relabeling all of the books in the collection would be a formidable task. For new acquisitions, those published in 1997 and 1998, the GPL puts some items on hold for a short time and waits to see if OSUL has purchased a copy of the book. This procedure will eliminate the problems of spine labels not matching the records in OSCAR.

While the project is by no means complete, we have finished one of the collections in the main stacks. Out of 1338 records checked in OSCAR, 708 titles (approximately 52%) were unique to the GPL. At this time we do not know how many of the titles will have records in OCLC and how many will need to have original cataloging.

All of the item records are now suppressed in OSCAR and are accessible only in the staff mode. When all of the duplicate titles have been added the records will be unsuppressed and made available to the public. Those titles that are unique will be added near the end of the project. The GPL will copy the title pages, versos of the title pages and record the call numbers. The Technical Services Department of OSUL has agreed to add this cataloging task to their own, already considerable, work quota.

Our library now has access to OCLC in the "view only" mode. We cannot update or add any records. We can of course have that capability "turned on" but that would necessitate more comprehensive training and supervision than we currently have. We might be able to lessen the burden for OSUL by recording OCLC numbers on the photocopies we submit to them. We can also send the shelf list records in our WordPerfect file although they may not be standardized enough to be of practical use. For example, our shelf list does not include the size of the book in the description area. Our shelf list does not contain as much information as the records in OSCAR.

Updating the serial holdings will be the final stage of the project. Very few of the GPL serials are bound. This complicates the issue of adding volumes to the serial records in OSCAR. The GPL may need to resort to a general "library has" statement for each serial title. Converting our serial check-in records to the online system OSUL uses is an option which has been discussed. This is feasible from a technological standpoint, but may prove to be too cumbersome in reality. The serials received by OSUL are sent to a central location in the main library while the GPL's serials will continue to be received directly. Perhaps there is another approach that we can use to regularly update our "library has" statements to ensure that our OSCAR records are reliable.

When the records are unsuppressed, the GPL will rely on the online circulation system of OSU Libraries. We now use a manual check out system, which means that we produce check out cards and book labels. This will no longer be necessary; we will only produce a spine label. Using the online circulation system will eventually mean less work for the library staff. We will have accurate library circulation statistics and better inventory control. We are now using this project as an inventory control mechanism. On the shelf list cards, we are noting whether the books are found on the shelf. The books that are manually checked out now will need to be recalled so that we can update records in OSCAR. This will be inconvenient for the patrons, but it is necessary to complete the project.

These changes in procedures will also mean that some of the library's patrons will need to be "retrained." They will not be allowed to keep a book for a year without officially acknowledging that they have it. They will need to renew their checked-out items on a regular basis. Byrd Center members will retain 24 hour access to the library, but they must be more accountable for the material they use.

When we are officially online we will not know when someone is looking at our holdings and if he has decided to come to the library. If that patron does show up at our door, we want to make sure that what is listed as available is actually on the shelf and can be checked out to him. The library will need to be staffed with at least one person during our posted hours. The library is now staffed with only one librarian and one or two student assistants. If the librarian is not in, Byrd Center members have their own keys and are for the most part, self-sufficient users of the collection. Obviously, we will need to guarantee library coverage to assist users unfamiliar with the collection. We may have shortened, regular hours, such as 1-5 p.m., Monday through Friday in the beginning. If library usage substantially increases, we can adjust the schedule accordingly. We will then need to train student library assistants to use the circulation system and give them the responsibility of managing the library in the librarian's absence.

Services to Users

The Byrd Center scientists and graduate students are the primary users of the GPL. We want to maintain the same level of service to them as we have in the past. These services include document delivery of articles and books located throughout the different OSU Libraries on campus. We process our own interlibrary loan requests and do our own reference work. The GPL will continue to manage the Publication Distribution Program for the Center. The completion of this cataloging retrospective conversion project and the agreement between the GPL and the OSUL should enable the GPL to be managed more efficiently with better results. We should have more time to work on other projects, such as updating the reprint collection.

In 1992 the Byrd Polar Research Center permanently moved to a new location designated as West Campus, away from main central campus. This gave the Byrd Center and the library much more needed space but also isolated us from other departments on campus. The GPL is now the only library situated on West Campus. A significant number of Center members have appointments in other departments and have elected to stay on main campus. Because of the size of the OSU campus, it requires effort to visit us and use our facilities. With the completion of this project those members will be able to verify the holdings in the GPL from their own offices and can even request material to be delivered to them without leaving main campus.

Conclusion

In 1978, at the 7th Northern Libraries Colloquy in Paris, Susan Schley, then the librarian at the Institute, concluded her presentation about the Goldthwait Polar Library by stating:

> At present, we do not have the money or the staff or the expertise to catalog and automate our library. I consider this to be a long range project, but one that we should be investigating now. Hopefully, we can start laying the groundwork so that an efficient transition can take place in the future. I think such a transition is necessary and inevitable. Meanwhile as librarian of the Goldthwait Polar Library, I would like to adopt a middle way that is both forward looking and realistic. I feel that we have a good collection of polar information and there is great potential for making it more widely available." (Schley 1982).

Twenty years later, money is still tight and library staffing is still a concern for the Goldthwait Polar Library. Despite these persistent issues, we now have a realistic solution to the problem of access to the collection. With the enormous technical support of the OSU Libraries, our holdings will not only be accessible to library users at OSU and throughout Ohio, but also to anyone, anywhere via the internet. We do not know the impact this will have on the daily operations of the library. We will wait and see. We need to be flexible and make adjustments when they are needed. We are confident that this collaboration with The Ohio State University Libraries will result in better library management. Their technical expertise and experience will only improve and strengthen the services the Goldthwait Polar Library has to offer its users.

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BRINGING ALL OF SCIENCE WITH US: BUILDING WEB SITES FOR SCIENCE LITERACY

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ABSTRACT: While scientific knowledge or content is the heart of science, there are universal scientific themes and processes which must be understood before anyone can truly understand and evaluate science and scientific information. This paper will examine these themes and processes and explore how database producers and information professionals can use them to foster science literacy.

Introduction

The purpose of this paper is to explore:

- Types of Science Literacy
- What We can do in Developing Web Sites for Science Literacy

http://horizons.sb2.pdx.edu/~fem-sci-lit/defin-scilit.html

The following are definitions of science literacy from a variety of sources.

(Compiled by B.Chadwick, research assistant)

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National Science Foundation Report

Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering and Technology, National Science Foundation, 1996.

Focus on improving education for all undergraduates: preparing K-12 teachers, a technical workforce, science majors, and improving science literacy for all. The need of all citizens for a "higher level of competence in science, mathematics, engineering and technology" is presented as primarily an economic concern, as corporations and employers are demanding more informed and proficient workers; but also a societal concern, in that scientifically knowledgeable citizens will be better able to make decisions about the use of technology and science.

Goals for educators:

- believe every student can learn
- have "high expectations, in a supportive climate"
- encourage a spirit of inquiry, excitement, a sense of wonder
- communication and teamwork
- teach critical thinking
- emphasize lifelong learning skills

Scientific literacy is knowing:

- what science is
- what science professionals do
- how to evaluate "scientific" information

http://horizons.sb2.pdx.edu/~fem-sci-lit/revised.htm

Scientific Literacy and Women's Studies

How we think about scientific literacy as an educational goal can either open up or close off avenues for introducing feminist perspectives into the science literacy curriculum (i.e., the coursework through which students will become scientifically literate). In our team, it seemed logical to begin at the beginning: how do we define scientific literacy? And therefore what are our educational goals? What do we think students ought to know by the time they leave our campus? As it turned out, this was a VERY contested question and what we thought would be a day's discussion turned out to take up most of our summer seminar. We started with the different positions in the literature on scientific literacy. We've come to a working consensus on what scientific literacy is and why we should value it. We reject some of the definitions of and justifications for scientific literacy, agree with some and find ourselves still debating others.

AGREE	UNDER DEBATE	DISAGREE
"Science as part of the liberal arts contributes to the satisfaction of the human desire to know and understand" (AAAS)	Allows citizens to engage in decision-making about public policy-(NRC)	Knowing a particular body of facts and scientific laws
"Scientific habits of mind" (Shamos, Dewey)	Allows citizens to engage in decision-making about personal life (NRC)	Create a common knowledge base through a standardized curriculum (Project 2061, Trefil)
Confidence in exploring the unknown in the natural/physical world	Promote a "rational" society	Sustain the Science Pipeline
Understand science in the making rather than science made	Scientific knowledge supplants superstition (Laetsch)	
Demystifying Science (Stephan J. Gould) facilitates entry into natural/physical science for previously excluded groups	Better Living Through Science:	

Scientific Literacy

- Practical scientific literacy
- Cultural scientific literacy
- Civic scientific literacy

Civic Scientific Literacy

A person who is has achieved civic scientific literacy has enough understanding of scientific terms,concepts, and processes to that she can read a newspaper or magazine and understand the essence of a controversy and make an informed decision.

Civic Science Literacy

- Vocabulary and concepts
  - » Use of jargon-explained
  - » Definitions in context
- Knowledge of processes
  - » “Science in the making rather than science made”
  - » The same science being described to all levels

WWW Science Sites for the Public

- Started as professional but expanded for public use.

- Started from beginning for general public.

- Designed for children

http://www.npr.org/programs/sfkids/showarchive/sfkc.98.06.26.html

Hour Two: Acoustical Oceanography

How do you discern a blue whale from a humpback, or a weakfish from a red drum, for that matter? Well, you could probably see the difference, but could you hear the difference? In this hour, we'll talk to scientists who are listening to the ocean and its inhabitants and learning about everything from whale migration to global warming.

Student Questions

1) Do fish make sounds?
2) How do they make them?
3) Why do they make them?
4) What does a blue whale song sound like?
5) Where do blue whales spend the winter? How about the summer?

Special Guests

Robert Spindel
Director, Applied Physics Lab
University of Washington
Seattle, Washington

Joe Luczkovich (LUHS-koh-vitch)
Associate Scientist
Institute for Coastal and Marine Resources
East Carolina University
Greenville, North Carolina

http://www.npr.org/programs/sfkids/showarchive/sfkc.98.06.26.html

Student Project: What is in a sound?

Goal:
To understand that sound can be used to find out about areas we can observe by sight (e.g. inside our bodies, within the ocean depths and far into outer space)

Background:
Sound is employed in equipment like sonar and echo-location to map the ocean floor and determine the location of large animals, submerged ships and other objects in the ocean. Sound is employed in medical equipment like ultra-sound to observe the growth and development of a human fetus prior to birth. Sound is also used to map oil and mineral deposits deep within the earth and to explore the properties of space objects. In some equipment the element being measured is the time it takes for sound to be sent out and returned. In other types of equipment the characteristic being measured is the frequency of sound wave which is produced by interacting with the object .

Procedure:
1. Place one hand flat, palm down, on a spot on your body. Strike the tip of the third finger of the hand with the third finger of your other hand. Practice until you get a consistent and clear sound. (This is what doctors do when they check the condition of your lungs).
2. Make a map of the internal structures of you body using the following sound guidelines:

- a) A dull sound indicates solid muscle (like on your thigh)
- b) A hollow sound indicates airy parts (like the stomach and lungs)
- c) A resonate or ringing sound indicates air and mass (like ribs)

http://www.npr.org/programs/sfkids/showarchive/sfkc.98.06.26.html

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Acoustical Scattering Models of Zooplankton and Microstructure By Timothy K. Stanton
Advanced Ocean Acoustics
Marine Ecosystems Studies
Questions About Careers in Oceanography: Who Supports Oceanographers?

Sonar Research - Penn State

INTERNET SITES:

Acoustical Oceanography News and Notes
Acoustical Oceanography Research Group!
Coastal Oceans Acoustic Center
Massachusetts Institute of Technology - Woods Hole Oceanographic Institute
National Oceanographic and Atmospheric Administration (NOAA)

http://atocdb.ucsd.edu

Acoustic Thermometry of Ocean Climate (ATOC)

What's New

ATOC Summary and Results

ATOC's Climate Research

ATOC's Marine Mammal Research

ATOC's California Source

http://atocdb.ucsd.edu/Climate_page.html

Acoustic Thermometry of Ocean Climate:

ATOC's Climate Research

The basic idea of ATOC is simple. Sound travels faster in warm water than in cold water. The travel time of a sound signal from a source near California to a receiver near Alaska, for example, will decrease if the intervening ocean warms up, and will increase if the ocean cools down.

The travel time is a direct measure of the average temperature between the source and receiver. The information obtained is similar to that which is obtained for the atmosphere by averaging temperature data from the many thousands of land-based weather stations that exist.

By measuring the travel times of these sounds, it is anticipated that basin-scale (entire ocean) measurements of ocean temperatures can be obtained that will provide important information for studying global climate questions, particularly global warming due to the "greenhouse effect."

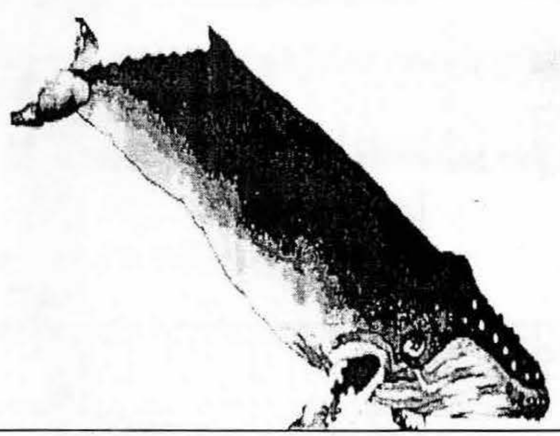
ATOC plans to employ two sources, one offshore California and one north of Kauai, and numerous receivers in the North Pacific. The transmission schedule is dictated by the marine mammal research program, but valuable climate data can be gleaned using the travel time data from these transmissions.

http://atocdb.ucsd.edu/MMRP_page.html

Acoustic Thermometry of Ocean Climate:

ATOC's Marine Mammal Research Program

The Marine Mammal Research Program (MMRP), led by Dr. Christopher W. Clark of Cornell University's Bioacoustic Research Program, is designed to provide information on hearing capabilities of marine mammals and sea turtles, response of marine mammals and other marine organisms to man-made sounds, (both from the ATOC source and from other sources, such as shipping noise), and to provide information needed to direct policies for long-term protection and conservation of marine species. The MMRP recognizes that the available data on the effects of low frequency sound on marine mammals are sparse and has designed a research protocol to broaden the information base.



http://atocdb.ucsd.edu/CAsourcepg.html

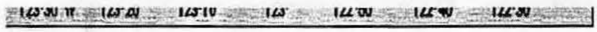
Acoustic Thermometry of Ocean Climate:

ATOC's California Source

ATOC's California sound source is located on Pioneer Seamount, 3,000 feet below the ocean's surface and approximately 50 miles offshore Half Moon Bay.

The Pioneer Seamount source began transmitting on December 2, 1995. Since then, the schedule of transmissions has been dictated by the California Marine Mammal Research Program (MMRP), led by Dr. Dan Costa of the University of California, Santa Cruz.

http://atocdb.ucsd.edu/CAsourcepg.html



The MMRP's decision to start a series of transmissions is based on a number of factors, primarily dependent on observation/survey opportunities. Once initiated, a series consists of twenty minute transmissions every 4 hours, following a 5 minute ramp-up period, which alerts any marine mammals in the vicinity of the source. The transmissions last from 2 to 4 days and are accompanied by a series of aerial surveys conducted in the days prior to and during the series of transmissions. (Click here to see transmission schedules.)

While Dr. Costa and his team are gathering marine mammal information, ATOC Climate data is simultaneously being collected by the network of receivers that rim the Pacific.

Return to ATOC Home

The Alternate Source Test

Recent Activity in California: A cable fault reported on 3/21/97, and possible fishing entanglement with the ATOC cable on 3/27/97

The ATOC Homepage is located at http://atocdb.ucsd.edu/

contact the ATOC Webmaster at atoc@igpp.ucsd.edu . Last updated 8/4/96 http://atocdb.ucsd.edu/atpubspg.html

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http://atocdb.ucsd.edu/what'snewpg.html

NEW NEW NEW

Acoustic Thermometry of Ocean Climate:

What's New

KAUAI MMRP PILOT SUDY COMPLETE - QUICK-LOOK REPORT AVAILABLE

NEW The "Quick Look Report of the Hawaii ATOC-MMRP Hawaiian 1997/98 ResultsÓ is now available. The report, which provides the data and preliminary results from the 1998 Kauai Pilot Study, is being provided pursuant to the Final Environmental Impact Statement (FEIS) for the Kauai MMRP in conjunction with the ATOC Project.

As indicated in the report, the overall conclusion from the research to date is that no acute or short-term effects, as defined in Table C-1 of the Kauai FEIS, were observed and that Òpresently there are no MMRP results indicating that any species shows any biologically significant adverse response to the operational ATOC sound or playback of the ATOC sound using several different underwater speakers.Ó

A brief summary of the Kauai Pilot Study results are as follows:

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ELECTRONIC PUBLICATION OF AN ARCHIVAL RESOURCE: THE ARCTIC BIBLIOGRAPHY

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ABSTRACT: The Arctic Bibliography (AB) is a multi-volume guide to the literature of the Arctic region through the early 1970s. AB was prepared by the Arctic Institute of North America with the support of government agencies of the U.S. and Canada. The 16 published volumes contain over 108,000 titles, with English abstracts. All subjects – science, technology, and the arts – are covered comprehensively, regardless of language of publication or document type. Each volume has its own detailed index to subject, place, and geographic feature. AB is considered difficult to use because of 1) access, since it lacks a compiled, single index, and 2) availability, since relatively few libraries are able to offer a complete 16 volume set to the user as time passes.

This paper offers a review of a new project to be carried out by the American Geological Institute, producers of GeoRef, with funding from the U.S. National Science Foundation. This project will result in an electronic version of AB, searchable on CD-ROM, Internet, or other media. The resulting electronic product will have several advantages over the printed product, assuring wide availability once again to a research community who may be overlooking the existence of prior relevant research.

The paper discusses the merits and the significance of AB as a reference tool, and attempts to convey the importance of this project for the polar information community which has been without easy access to the material contained in AB for too many years.

KEYWORDS: Arctic regions--Bibliography, Electronic data processing

INTRODUCTION

The Arctic Bibliography (AB) is a multi-volume reference work prepared for, and in cooperation with, the Department of Defense under the direction of the Arctic Institute of North America between 1953 and 1975. The first twelve volumes were published by the U.S. Government, and the final four volumes by McGill Queen's University Press in Canada. AB has been out of print for many years, and is now available only in reprint from Swets ($1664) or on 35 mm. microfilm from UMI (approx. $800).

The Arctic Bibliography Project, set up in 1947 as a short-term effort to "... produce a comprehensive bibliography of Arctic research publications" (Tremaine 1948), eventually resulted in 16 volumes containing 108,723 bibliographical citations with abstracts, and a comprehensive index. The first Directing Committee (see Appendix A) for the Project was chaired by Dr. H.B. Collins, Jr., of the Smithsonian Institution, and included such well-known "Arctic" names as Vilhjalmur Stefansson, Lincoln Washburn (credited in vol. 13 with having conceived the idea of AB), and Sir Hubert Wilkins. Some members of this committee are historic figures in themselves: Dr. Vilhjalmur Stefansson was a noted explorer of arctic regions and Sir Hubert Wilkins was a noted polar explorer and photographer.

"The Directing Committee and Project Staff in consultation, decided to place primary emphasis on publications giving the explorers' and scientists' own record of their work in the area of interest, results of expeditions and investigations as produced by their members; .... as much of the original records of arctic research and exploration as may be analyzed and indexed ..." (Tremaine 1948). The point of view taken in preparation of AB was enhanced by the diversity of the Project Staff. The director, Marie Tremaine, was a reference librarian, and the data analysts were scientists who, in many cases, had immigrated to the U.S. after World War II bringing, along with their scientific training, the benefit of multifaceted language skills.

AB was planned as part of a program of coordinated research over a very broad front, and was seen as fundamental to any productive program of Arctic research (Tremaine 1948). The Arctic Institute of North America was incorporated in both Canada and the U.S., and its board of governors included a member from Denmark as well. AB extended this international cooperation, involving all countries with interests in the Arctic. AB arose in response (Smith 1970) to the need for a comprehensive bibliography of the Arctic demonstrated by the fact that there existed only very old or incomplete bibliographies of the Arctic regions. Both the U.S. and Canadian governments were willing to support this endeavor in order to cope with the large number of publications reporting on research in the Arctic following World War II. At the beginning of the Cold War there was speculation that, in the event of a World War III, the Arctic would be the meeting ground between the

U.S.S.R. and the West. Therefore such U.S. agencies as the Dept. of Defense and other military agencies, and Canadian agencies such as the Defence Research Board, were the major financial contributors to the project. In later years other agencies of both national governments contributed.

SIGNIFICANCE OF THE ARCTIC BIBLIOGRAPHY

The Arctic Bibliography is considered to be "the best regional bibliography ever compiled" and "an outstanding example of the place of bibliography in modern scientific investigation" (Corley 1985). The decision to discontinue AB after vol. 16 was published in 1975 had nothing to do with the quality or the usefulness of the work, but rather rested on the belief that the new electronic bibliographic databases, also receiving U.S. government support, would include the information sources covered by AB. A study published in 1977 (Orr 1977) indicated that this would not be the case, but the decision regarding AB had already been taken and was not to be reversed (Arctic Bulletin 1977). Over the past twenty years, little has changed in this regard. The electronic databases, even those concerned exclusively with polar and cold regions, have all been discipline or mission oriented, and although much Arctic literature is covered there has been no substitute for AB, which is equally useful to the sciences, social sciences, and humanities.

AB has many distinguishing characteristics that make it as valuable now as it was during the time of its publication. These characteristics include: the wide scope of its coverage in terms of area, subject, time, and language, and its high quality abstracts.

1. **Area coverage.** Because research on the Arctic has historically been interdisciplinary, bibliography on the arctic has also followed this pattern. Thus all subjects are covered for a geographic region. A defined Arctic was divided into approx. 70 regions with a map showing these regions (which varied slightly over the years) included in each volume. The area defined extended from the Arctic Basin to Alaska, across Canada to Greenland, northern Scandinavia, Finland, and the U.S.S.R., ending with Komandorskiye Ostrova. Each record was indexed to at least one of the 70 regions, as well as to geographic coordinates and the names of geographic features. All geographic names in the index are in authorized form.

2. **Subject coverage.** The composition of the original directing committee shows as well as anything the breadth of subject matter AB expected to cover, starting with exploration and expedition records and proceeding to contemporary scientific investigations. There was no "mission" limiting coverage to certain disciplines; AB is comprehensive and its multidisciplinary approach brings together information pertinent to defined Arctic areas from a great diversity of subject fields. All document types were included, and each volume included a list of journals covered; these numbered over 700 by vol. 16. All records were indexed to subject and specific topic. A.C. points out

(A.C. 1968) that in vol. 3. under "Expeditions" there follows one hundred pages giving the official name and dates, as well as bibliography, for several hundred expeditions in a near "ready reference" format. Vol. 8 "carries also the first published abstracts of the British Parliamentary Papers on Arctic Expeditions, an heroic compilation from the 'Arctic Blue Books' by Dr. Andrew Taylor that lays open to easy use a hitherto un-indexed wilderness of primary sources of the greatest geographical and historical importance." (A.C. 1968)

3. **Time period covered.** AB provides scholars with access to the literature of the Arctic regions from 1800 up until collection of materials for AB stopped in approximately 1972. The first three volumes chiefly cover the years 1800-1950. These volumes are "the best guide to the literature of northern exploration and development during the nineteenth and the first half of the twentieth centuries" (A.C. 1968). Later volumes, while concentrating on current literature, also included retrospective coverage.

4. **Foreign language coverage.** References from foreign language materials bring the culture beyond the English speaking world to the desk top of the interested user in any country. The art, archaeology, and literature of indigenous peoples is covered extensively. Documents published in foreign languages comprise a significant proportion of AB; less than 50% of documents abstracted were originally published in English. The major foreign languages covered were Russian, German, and the Scandinavian languages. However, there was a significant proportion of "other" languages covered, as high as 19% in vol. 8 (A.C. 1968). All foreign titles were included, and an English translation of the title provided; abstracts were in English only.

5. **Abstracts.** Abstracts were written by subject specialists in various fields who commanded a wide range of languages. In every case these specialists consulted the original publication. The location of this publication is indicated at the end of every entry. For many users, the comprehensive English abstracts provide adequate information in place of the original document which either may not be generally available, or in a language not understood by the user.

ACCESS TO, AND AVAILABILITY OF, THE ARCTIC BIBLIOGRAPHY

The problem that this project is designed to address is limitations on access to Arctic research literature, caused by lack of awareness of and access to AB.

Access to AB is severely limited in terms of its index, and its availability to the potential user. Young Arctic researchers are completing theses without knowing of the existence of AB, which could mean that funding agencies and performing groups are repeating work already done in the past, or at the very least are basing current work on a false assumption as to work already completed in the field of interest. Even those aware of its existence are unwilling or unable to make the effort to locate these volumes and use the index provided.

1. **The Index.** As indicated in the preceding sections, indexing for AB was elaborate and exceptional in terms of information provided. The index was in a single alphabet, with subheadings and cross references. It typically occupied well over 25% of the total number of pages in each volume, even printed in a reduced type size. Vol. 3 is entirely index for vols. 1 & 2. The contents of the printed volumes, averaging over six thousand records each, are accessible only by skilled use of this high quality if somewhat complex index. Unfortunately, no cumulative index for the sixteen volumes has ever been prepared. "...as the volumes of Arctic Bibliography pile up and the use made of them is increasingly retrospective, it becomes ever more time consuming to leaf through the index to each volume" (A.C. 1968, after 13 vols. had been published).

2. **Availability of AB.** Before one even deals with the problems of using the indexes to AB, one must first locate a complete set of 16 volumes. This in itself is becoming increasingly problematical as shown by a search of the two polar regions CD-ROM databases. PolarPac (WLN), which contains the holdings of over 50 polar regions libraries from several countries, revealed only 17 complete sets in 7 different countries; a search on Arctic & Antarctic Regions (NISC) added three more. This number probably under-represents the true case since AB was a government document (for 12 volumes), and a reference work, while being issued serially. Government documents and reference works may not be included by all libraries contributing records to the polar regions CD-ROMs. Searching outside of the polar regions databases was not very rewarding, although several large public libraries (New York, Chicago, Denver) do hold complete sets. However, the MELVYL library system (catalog for the University of California and California State libraries), shows only 3 libraries with holdings, all incomplete. This was also true for the University of Colorado which has only 13 volumes.

It is apparent that the sheer act of physically locating a complete set of AB is difficult to impossible for the user outside of a specialist institution. As mentioned in the Introduction, AB has been out of print for many years, and is now available only in reprint or on microfilm at a very high cost.

WHY THE ARCTIC BIBLIOGRAPHY SHOULD BE MADE AVAILABLE ELECTRONICALLY

"By not being digital you are prevented from informing today and tomorrow with yesterday" ([Taylor] 1997). Even when a set of AB is located, the daunting task of looking at 14 (v.3 is the index to v. 1 & 2) different and differing indexes (they changed to accommodate new directions over the years) is discouraging to those users now accustomed to quick access, perhaps even from a home computer or at least on a LAN.

The advantages of having AB available electronically are:

1. **AB material is not available elsewhere electronically.** Although one of the reasons why AB lost U.S. government funding was the notion that the growing number of electronic databases becoming available during the 1970s would cover the same ground as AB had, this was shown not to be the case (Orr 1977). In fact, very little of the material covered by AB has been indexed by electronic databases, although had AB continued there might have been an increasing amount of overlap. Electronic bibliographic databases such as Chemical Abstracts, Biosis, and GeoRef, only became available during the 1970s at about the same time as AB ceased collecting material, and retrospective indexing for the electronic databases did not have as high a priority as did computer generated materials. The small amount of overlap with other indexing services becomes insignificant when one realizes that AB provides extensive abstracts for materials only indexed (and not abstracted) by other services such as GeoRef.

2. **AB's index is not adequate to access material within.** In spite of the many good qualities of the AB index, there is no way that any student or researcher can be expected to plough through a sequential index several thousand pages long. A computer generated index to an AB in digital form is crucial to provide random searching capabilities.

By making AB available electronically, both of these issues are addressed.

CONSTRUCTION OF THE ARCTIC BIBLIOGRAPHY DATABASE BY THE AMERICAN GEOLOGICAL INSTITUTE

The American Geological Institute (AGI) plans to construct the database from AB in the format which it uses for its GeoRef database, adapting existing programs to the parsing of AB. AGI's GeoRef database uses the fields specified in the UNISIST Reference Manual for Machine-Readable Bibliographic Descriptions. The Reference Manual is an international standard for exchange of bibliographic databases, and includes provision for all fields needed. In addition, GeoRef is available in the USMARC format, which is maintained and supported by the MARC Standards Office at the Library of Congress, and widely used in libraries throughout the United States. There would be a USMARC version of AB in addition to the simpler ASCII format used for GeoRef.

AGI has substantial experience with converting printed bibliographies into electronic databases and will bring this experience to the conversion of AB.

Since 1969, the AGI has produced the GeoRef database and the printed Bibliography and Index of Geology through constant monitoring of the current geological publications. This is an ongoing, daily process that involves checking the collection of the U. S. Geological Survey library system as well as other science libraries in the Washington, DC area. While this process works fairly well for current material, a need has been recognized for data from foreign and retrospective sources. To deal with the retrospective sources AGI has engaged in various data capture operations through the years.

AGI's first major effort in this direction involved digitizing the Bibliography of North American Geology, 1785-1967, published by the U. S. Geological Survey and the Bibliography and Index of Geology Exclusive of North America, 1933-1965, published by the Geological Society of America. These two major bibliographies contained 288,000 references and were digitized over a period of five years. This project was a tremendous learning experience. The main lesson acquired from this project was, (no surprise), that work done manually does not turn out to be as consistent as one wishes it could be. Assumptions required for parsing the data into its separate fields had to be based on data such as punctuation and style that are subject to human error and creativity. To compensate for this, a very flexible testing system for checking data within fields had to be developed. Based on this experience, AGI has continued to develop processes to ease data capture and conversion. In addition to conversion of major retrospective bibliographies, including most recently, the Abstracts of Chinese Geological Literature, AGI has developed relationships with more than 30 national and international organizations that are producing bibliographic information in the geosciences. All of the data provided by these sources undergo rigid automated review for conformity to acceptable standards for bibliographic information. AB fits very well into AGI's program of filling in gaps in retrospective coverage of the geoscience literature. Approximately 30 to 35% of the records are directly relevant to the geosciences. All of the procedures for this type of data capture and conversion are in place and AGI's staff is practiced in parsing data for field consistency. Data capture will be accomplished by a system of double-keying. Variances from the double-keying are checked and corrected. This process results in 99.995% accuracy and eliminates the need for extensive copy editing. During the keying process several steps are taken to make future processing easier. First, tags for fields that are easily identified are inserted into the data stream. Symbols denoting diacriticals and mathematical symbols are employed to allow the various languages represented in the original to be reproduced.

One characteristic of AB that became quickly apparent was the use of two different transliteration schemes for the Cyrillic alphabet. To be retrievable in an electronic environment, these differences must be eliminated. During keying, tags indicating the Russian ia or ya will be inserted to allow systematic changes later. One marvelous feature of AB is the extremely consistent handling of style for serials. Serials represent as much as 85% of the references and were handled in fairly consistent formats for almost all volumes of AB. The result is easy handling by the various parsing programs. Non-serials are a different matter and will require some creative processing and heavy editing.

AGI will attempt to maintain as much connection between the original and the final product as may be useful. The original reference numbers will be maintained and library holdings will be reflected where given. Some fields will be enhanced. Serial titles will be assigned an ISSN where one exists. A language identification algorithm will determine text languages where possible making this a searchable field. The area of most enhancement will be the indexing. The subject indexing will be supplemented using the GeoRef Thesaurus. Within the GeoRef Thesaurus, automatic structures allow the addition of geographic data and hierarchical information for most geologic ages, rock types, minerals, and fossils. An example of geographic enhancement might be Adak Island. The GeoRef Thesaurus will add Aleutian Islands, Southwestern Alaska, Alaska, and United States as potential searchable index terms allowing retrieval at both the most specific level and at the broadest level. For geographic areas that have changed names through the years, AGI is contemplating additions of both current and former forms of the names.

DISSEMINATION OF THE ARCTIC BIBLIOGRAPHY DATABASE

The final product of the project will be an electronic database consisting of the references, abstracts and indexing contained in AB. Availability of AB electronically will have all of the advantages of great versatility, especially in regard to options for retrieval, since the user can combine searches for author, title, keyword in text, date, source, etc. The time savings, and the sophistication of current software, will enhance the value of this product over the printed form.

An electronic version of AB will make a wonderful complement to other related databases already included on CD-ROM, such as both of the polar regions CDs, and also to selected disciplinary databases which are lacking those materials in their subject areas.

APPENDIX A

FIRST DIRECTING COMMITTEE OF THE ARCTIC BIBLIOGRAPHY PROJECT

Dr. Henry B. Collins, Jr., Smithsonian Institution, Chairman

Dr. Burton W. Adkinson, Chief of the Maps Division, now Director, Reference Department, Library of Congress

Dr. Richard Foster Flint, Professor of Geology, Yale University

Mr. Robert C. Gooch, Chief of General Reference and Bibliography Division, now Assistant Director, Reference Department, Library of Congress

Representative, Department of the Army and Department of the Air Force
Representative, Office of Naval Research, Department of the Navy

Dr. Vilhjalmur Stefansson, New York, N.Y.

Dr. A.L. Washburn, Arctic institute of North America, Washington, D.C.

Sir Hubert Wilkins, Washington, D.C.

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ELECTRONIC ACCESS TO ANTARCTIC INFORMATION: PROJECTS AND EFFORTS OF THE NATIONAL SCIENCE FOUNDATION

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ABSTRACT: The National Science Foundation (NSF) is initiating two projects of significant interest to the polar library community.

One project concerns the reporting obligations of signatories to the Antarctic Treaty. Although these reports have traditionally been submitted in hard copy, a proposal has been agreed upon at the 22nd Antarctic Treaty consultative meeting in Tromsø, Norway, to make future reports available in electronic format. The National Science Foundation was asked to develop a specific plan for implementation before the next treaty meeting in 1999. It is expected that polar librarians around the world will be instrumental in providing access to these reports.

Additionally, the NSF Office of Polar Programs since 1963 has supported the Library of Congress production of the Antarctic Bibliography - a list with abstracts of books, reports, and articles appearing in the scientific literature about the Antarctic, accompanied by full text of these documents on microfiche.

Although the bibliographic citations and abstracts are made available by the Library of Congress and in commercial databases, the microfiche of the full texts is available in only six sets. NSF would like to expand the availability of these full text documents to make them accessible to a wider audience of researchers, and to make distribution and use of the documents easier and more efficient.

Modern library technology and distribution networks now make it possible to store documents in a digitized format and to distribute them, on demand, electronically to any location with an Internet connection. This means that scientists who may not be working near one of the core microfiche collections would have access to these documents at any time, without waiting weeks for access to critical information. Not only would this benefit scientists working through the auspices of the National Science Foundation, but it would open up the availability of this invaluable collection to scientists and students all over the world.

While the library and publishing worlds appear headed toward broad-scale solutions, based on the Internet, for future publications and collections, the valuable retrospective collection of the Antarctic Bibliography project dating back to 1951 merits special attention.

The National Science Foundation is currently in the planning stages of these projects, and seeks the advice and information of librarians around the world who have an interest in this document collection and these reports in order to work toward suitable formats and technologies, and possibilities for cooperation in implementing the project.

At the same time, the continuance of the Antarctic Bibliography is in danger due to changes in funding and programming. The National Science Foundation is looking toward the ideas and expertise of the polar library community to develop a cooperative program, at least partially funded by NSF, to ensure the continuance of this valuable resource.

KEYWORDS: NATIONAL SCIENCE FOUNDATION (U.S.), ANTARCTIC BIBLIOGRAPHY, ELECTRONIC PUBLISHING, DOCUMENT DELIVERY, ANTARCTIC TREATY SYSTEM, INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS. SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH.

The National Science Foundation (NSF) is an agency of the United States government whose mission is to promote research in the U.S. in all fields of the sciences, mathematics, engineering, and the social sciences, and to promote education in these fields. This mission is carried out primarily by the distribution of research grants to public and private institutions. The Office of Polar Programs (OPP) of the National Science Foundation is additionally charged with running the U.S. research program in Antarctica. Toward the fulfillment of both of these missions, OPP is currently involved with two projects that potentially will make a significant impact on the future of polar libraries worldwide. These projects are: 1.) making Antarctic Treaty obligation reports available on the World Wide Web (WWW) in full text, and 2.) digitizing and distributing a special collection of documents on Antarctica. An additional issue of importance to the polar library community is the future of the Antarctic Bibliography.

I: The Antarctic Treaty Obligation Reports

At the 22nd Antarctic Treaty Consultative Meeting in Tromsø, Norway, 25 May - 5 June 1998, the United States submitted an information paper, initiated by Guy Guthridge of OPP, proposing that annual reporting obligations of signatories to the Antarctic Treaty should be submitted in electronic format. These reports have traditionally been printed in a limited number of copies by each of the 27 consultative countries and distributed to each of the other signatories.

Each of these reports contains a wealth of important information. They describe, in detail, exactly what each country is doing in Antarctica during a current year, and their planned activities for the next year. This information includes detailed research plans, logistical information, sites, personnel, equipment, impact on the environment—virtually everything that occurs on or near the continent. Since these reports have up to now only been available in very limited editions, this information has not been widely accessible. By putting full text of these reports on the WWW, they will not only become essentially universally available, but the reports and the information that they contain will also be easy to locate. It is envisioned that eventually each signatory country will make its report available on its own web site, and that they will also be accessible either as files or as links from a number of other web sites such as that of the Scientific Committee on Antarctic Research (SCAR) http://www.scar.org/ . It is expected that polar librarians around the world will be instrumental in promoting this project in their own country and in providing access to these reports.

At the Tromsø meeting, the National Science Foundation was asked to develop a specific plan for implementation before the next treaty meeting in 1999. Since the U.S. normally makes its annual report available in November, this seemed a natural date for the NSF to unveil a prototype for this project, although it meant moving forward quickly. The NSF is working with a private consulting company, the Andrulis Corporation, to develop a format that could be implemented by the other signatory countries.

Several factors were considered critical in developing this prototype:

1. The format must be technologically easy and relatively inexpensive to implement.
2. The format must be compatible with display on the World Wide Web (WWW).
3. The format must lend itself to display of both graphics and text.
4. The format must be sufficiently standard so that it can be an archival product.
5. The format must allow for easy and direct access to any specific part of the individual document or to specific informational elements within the document.
6. The format must be amenable to electronic access in a way that also satisfies the annual reporting needs of SCAR, which uses much of the same information as is found in the treaty reports. Thus instead of making two reporting documents each year, signatory countries will only need to make one.

The first format considered for the prototype was Adobe System's PDF format. Although this is a proprietary format, the software that allows a user to read PDF documents is provided free. Documents in PDF are platform and operating system independent and available without software costs to the reader. It is fast and inexpensive to produce. It is also widely used, so that if it becomes obsolete a variety of translation options to newer formats are likely to be developed quickly. Since PDF is an imaging product, both text and graphics are supported in a high-quality display, limited only by the hardware capabilities, desired file size, etc. Files are easily transmitted electronically. PDF, therefore, fulfills the first four critical factors listed above.

The disadvantage of the PDF format principally lies in the fact that standard WAIS search engines are not able to penetrate documents in this format. This, again, is due to PDF's being an imaging, rather than a text-based, product. To overcome this a document would have to include a "mini-web site" to accompany the PDF images. The web site would contain all the pertinent indexing information. Since these "gateway" web pages would be in HTML, they would be searchable and allow for relatively easy location within the PDF files of specific sections or informational elements of the report.

Antarctic Treaty report topics (from rec. VIII-6, 1975)	**Corresponding SCAR report topics (from SCAR Circular 669, 1995)**
I. Ships, aircraft, vehicles	
II. Dates of expeditions	
III. Station locations and dates	2. Wintering stations, lat., long. 3. Summer stations
IV. Names and functions of personnel	1. Addresses of SCAR committee, operating agency
V. Armaments	
VI. Program of work and science, and where	4. Automatic observatories, stations 5. Project descriptions 6. Planned new programs
VII. Scientific equipment	
VIII. Transportation and communication	
IX. Facilities for rendering assistance	
X. Nongovernment expeditions	
XI. Unoccupied refuges	
XII. Numbers of species killed	
XIII. Radioisotopes used	
XIV. Research rockets used	
XV. Oceanic research	
XVI. NGA station visits	

To design such a mini-web site would require a number of judgment calls, however. The designer would be called upon to decide exactly how large a section of the document would produce a file that would be optimum for both production of the PDF document and for allowing sufficient specificity for ease of searching. The table of contents and other introductory materials would have to be designed very carefully to be sure to include all the bits of information for which any possible interested party might be searching—and since so many different disciplines have an interest in this information it would be difficult to be sure of including all possible "gateways" to the information for people as diverse in outlook as political scientists and marine biologists.

In the end, it was decided that the optimum format for the obligation reports would be a document presented basically in HTML but with some parts presented in PDF format. Additionally, the entire report will be available in PDF format for downloading and printing.

Since electronic text is easily rendered into basic HTML by any of a variety of HTML converter software programs, and since some very good converter programs are available even as freeware, it is envisioned that this hybrid format will be both technologically easy and relatively inexpensive to produce. The HTML sections will encompass the straight text portions of the document. The text will thus be completely searchable by WAIS search engines, so that all the informational elements contained in the document will be easily accessible. HTML also allows for the elegant display of both text and graphics, and allows great flexibility for design, display, searching, correction, and modification.

However, although the conversion of text into HTML is very simple, the attractive and accurate display of some graphics, such as tables and charts, can be very complex. For this reason, the National Science Foundation prototype will display these informational elements in a PDF format. Using PDF for these selected graphics frees the producer from needing extensive HTML expertise to ensure accurate display of graphical elements. However, the textual accompaniments to graphical displays are general sufficiently detailed to allow the researcher using the document to find any specific informational elements that are contained in the graphics.

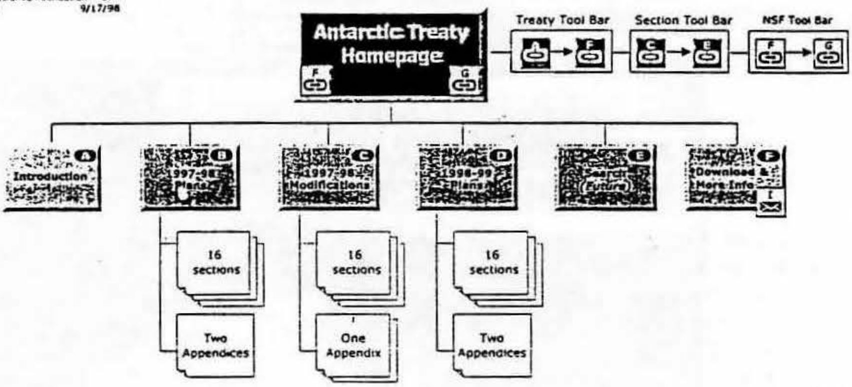
The inclusion of these graphical displays as PDF-formatted documents rather than in HTML format would be purely a matter of choice for the document producer as a way to keep effort and costs at a minimum while still providing a document that is both elegant and useful. Any entity that preferred to provide the entire document in HTML would, of course, be encouraged to do so.

This hybrid format fulfills all of the criteria listed above. It provides what the NSF feels to be the optimum format at this time for the wider dissemination of the Treaty obligation reports and the information they contain. There will also be a copy of the complete document available entirely in PDF format for ease of downloading and producing a print copy, if needed.

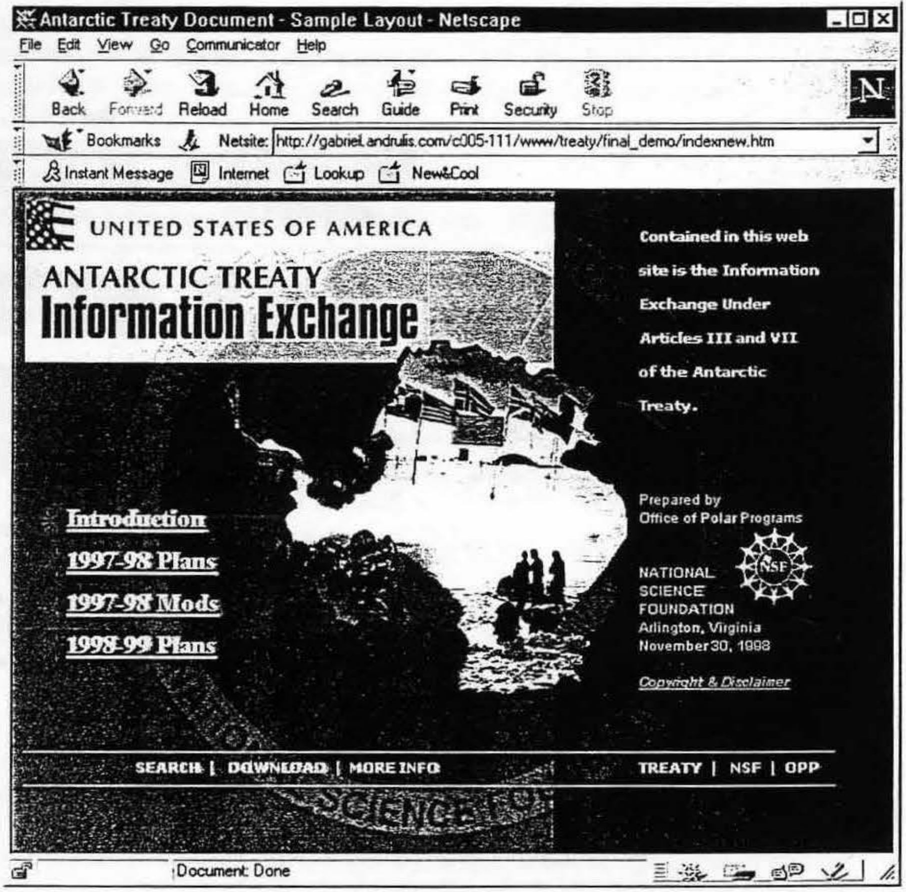
The publication of this report as a web document instead of a limited-distribution printed document opens many exciting possibilities. The wealth of information contained in this document will now be widely available. In addition, the fact that the text will now be searchable will mean that the information will be readily usable in ways not formerly envisioned. Particularly if the reports of all the signatory countries become available in searchable web-based formats, trends and comparisons across years and across countries will be readily extractable. Discrete informational elements will also, of course, become easily locatable within each document. As these documents become available as WWW documents, a HARVEST-type search engine could be used for cross-document searching. For instance, should a researcher need to know which scientists are currently working on, or planning, research projects on, for example, penguins, the information would be immediately available, and research efforts could be coordinated easily between researchers with similar interests but who are from different institutions or countries. Similarly, if a researcher needed to have access to a research vessel, it would be a simple matter to determine which vessels from which countries might be available at the requisite time and location. This opens up exciting possibilities for international coordination of Antarctic research, as well as for historical studies of trends in research efforts, etc.

Because I am a librarian and, like many of you here, am in a library that is becoming more "electronic" with every passing day, I know this project will be inherently interesting to you. But there are two other reasons NSF and I value the opportunity to talk about this initiative with the polar libraries colloquy. First, the project will fully succeed internationally only if all the Antarctic nations adopt the idea of electronic access, preferably in compatible formats. Second, the project seems destined to kill two birds with one stone, automating the treaty information exchanges in a way that the national representatives to the Scientific Committee on International Research or SCAR, can adapt to the required annual SCAR exchanges. The overlap between these two reports is almost total, as the accompanying table shows. This table is from the U.S. paper presented to the Antarctic Treaty meeting in Tromsø as I noted earlier. So we as information professionals have a chance to make annual exchange of Antarctic information more efficient and more timely, for both producers and researchers. I believe those of you representing or having access to Antarctic programs in your countries are vital to technical and management decisions that need to be made. The National Science Foundation has decided to make electronic information the primary means of communicating with its customers, and we want to share this opportunity with others as we can. We believe these reports have audiences who willingly can tolerate abandoning printed copies altogether—starting this year—and the United States treaty obligation report for this year will not be distributed as a printed report except by specific request!

National Science Foundation - OPP
C005-111 9/17/98



ON-SITE LINKS	Off-SITE LINKS	E-MAIL LINKS
A - Introduction	G - NSF Home	I - opp@nsf.gov
B - Plans for 1997-98	H - OPP Home	
C - Mods for 1997-98		
D - Plans for 1998-99		
E - Keyword Search		
F - Download & More Info		


Antarctic Treaty Document - Sample Layout - Netscape
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ANTARCTIC TREATY
Information Exchange
Contained in this web site is the Information Exchange Under Articles III and VII of the Antarctic Treaty.
Introduction
1997-98 Plans
1997-98 Mods
1998-99 Plans
Prepared by
Office of Polar Programs
NATIONAL SCIENCE FOUNDATION
Arlington, Virginia
November 30, 1998
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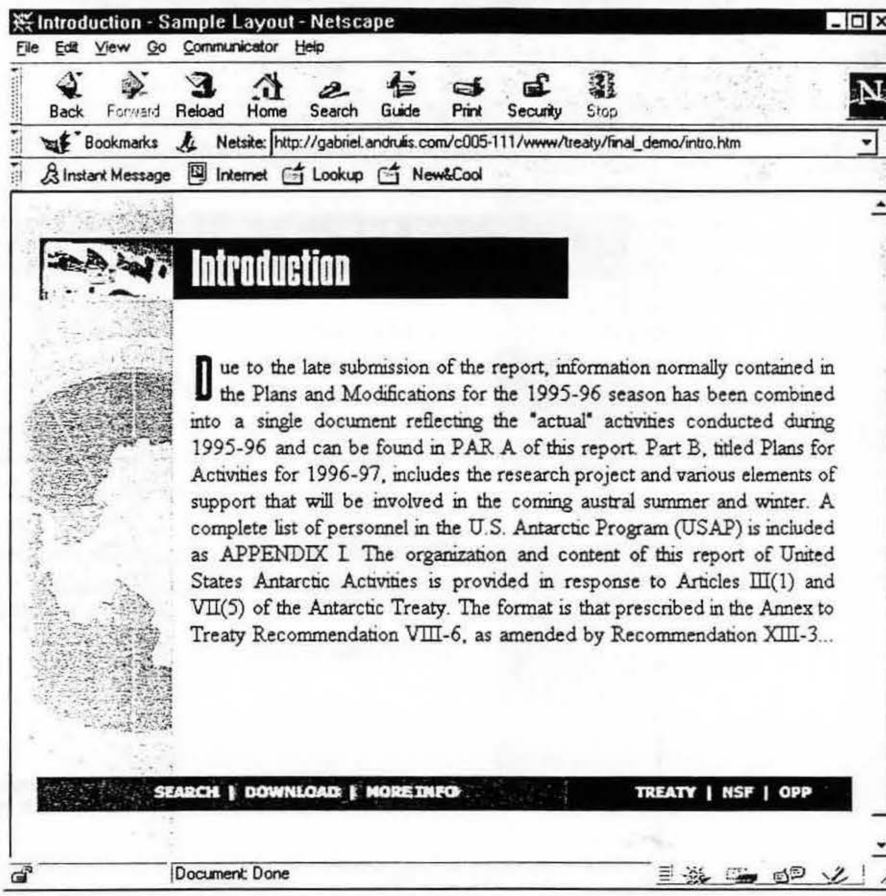
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Introduction
Due to the late submission of the report, information normally contained in the Plans and Modifications for the 1995-96 season has been combined into a single document reflecting the "actual" activities conducted during 1995-96 and can be found in PAR A of this report. Part B, titled Plans for Activities for 1996-97, includes the research project and various elements of support that will be involved in the coming austral summer and winter. A complete list of personnel in the U.S. Antarctic Program (USAP) is included as APPENDIX I. The organization and content of this report of United States Antarctic Activities is provided in response to Articles III(1) and VII(5) of the Antarctic Treaty. The format is that prescribed in the Annex to Treaty Recommendation VIII-6, as amended by Recommendation XIII-3...
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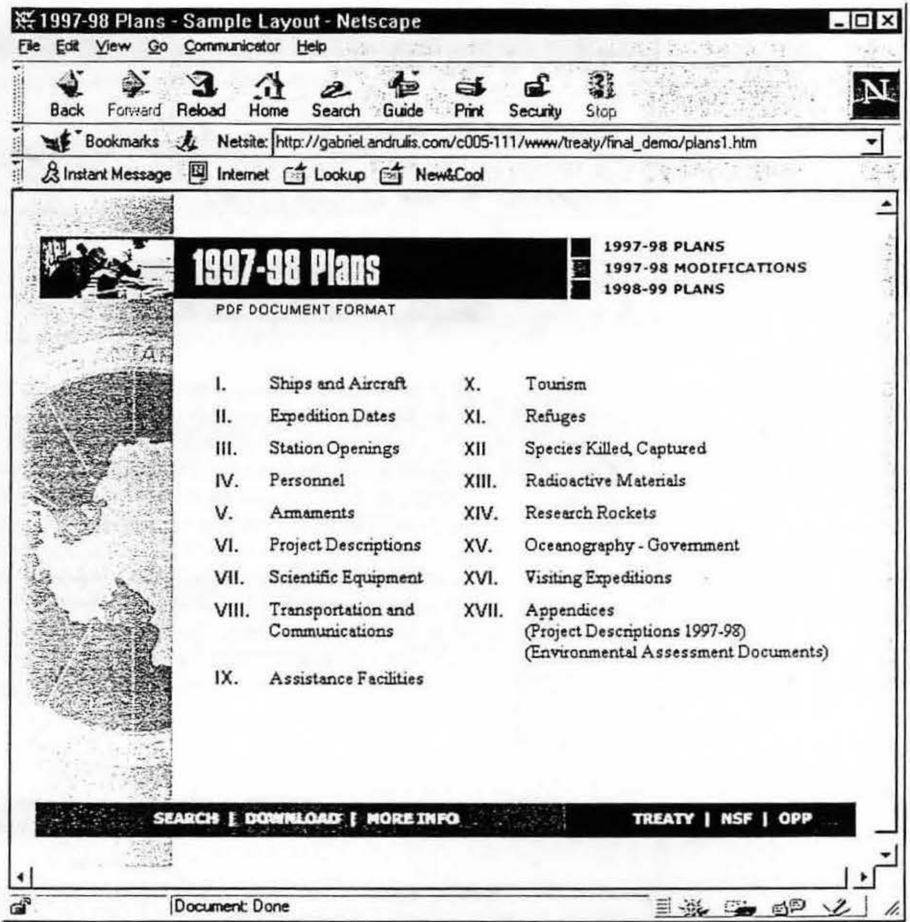
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1998-99 PLANS
I. Ships and Aircraft
II. Expedition Dates
III. Station Openings
IV. Personnel
V. Armaments
VI. Project Descriptions
VII. Scientific Equipment
VIII. Transportation and Communications
IX. Assistance Facilities
X. Tourism
XI. Refuges
XII Species Killed, Captured
XIII. Radioactive Materials
XIV. Research Rockets
XV. Oceanography - Government
XVI. Visiting Expeditions
XVII. Appendices
(Project Descriptions 1997-98)
(Environmental Assessment Documents)
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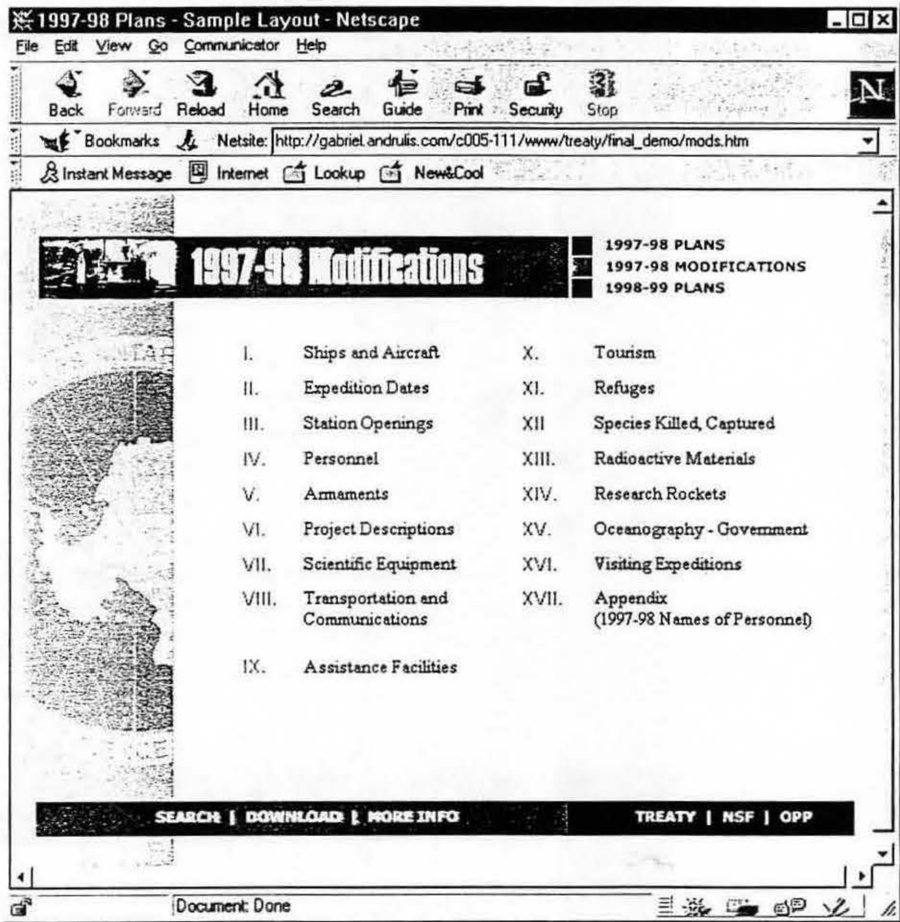
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XI. Refuges
XII Species Killed, Captured
XIII. Radioactive Materials
XIV. Research Rockets
XV. Oceanography - Government
XVI. Visiting Expeditions
XVII. Appendix (1997-98 Names of Personnel)
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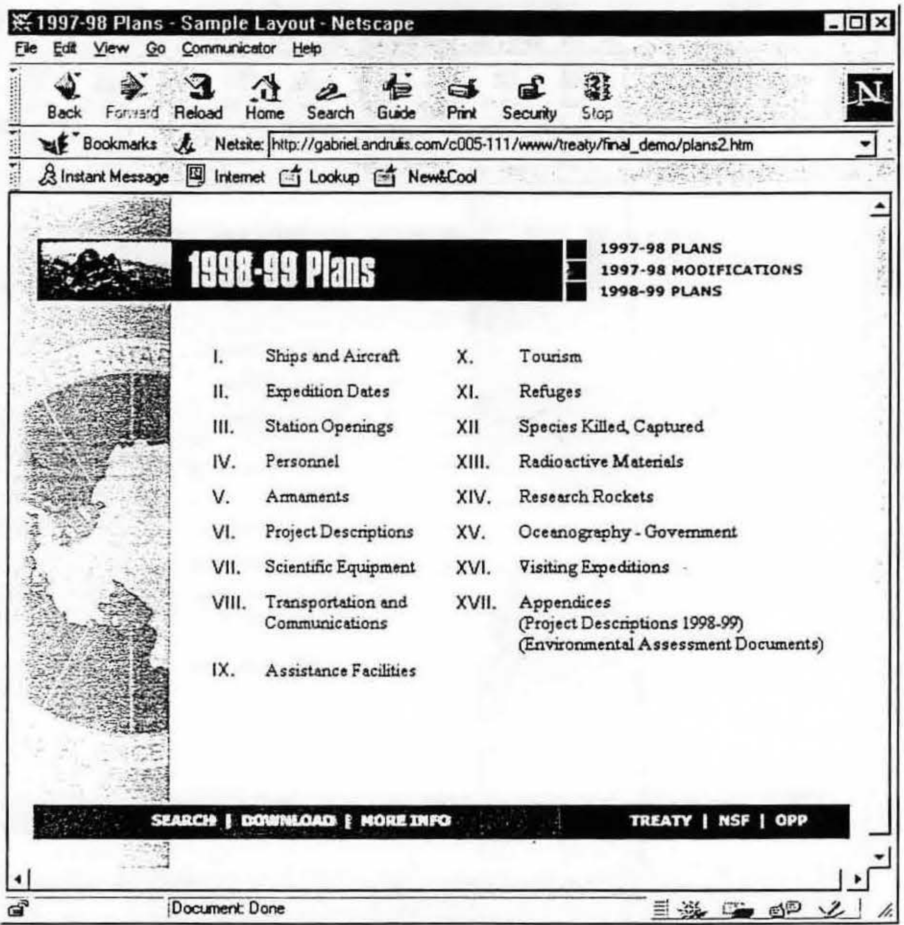
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XVII. Appendices
(Project Descriptions 1998-99)
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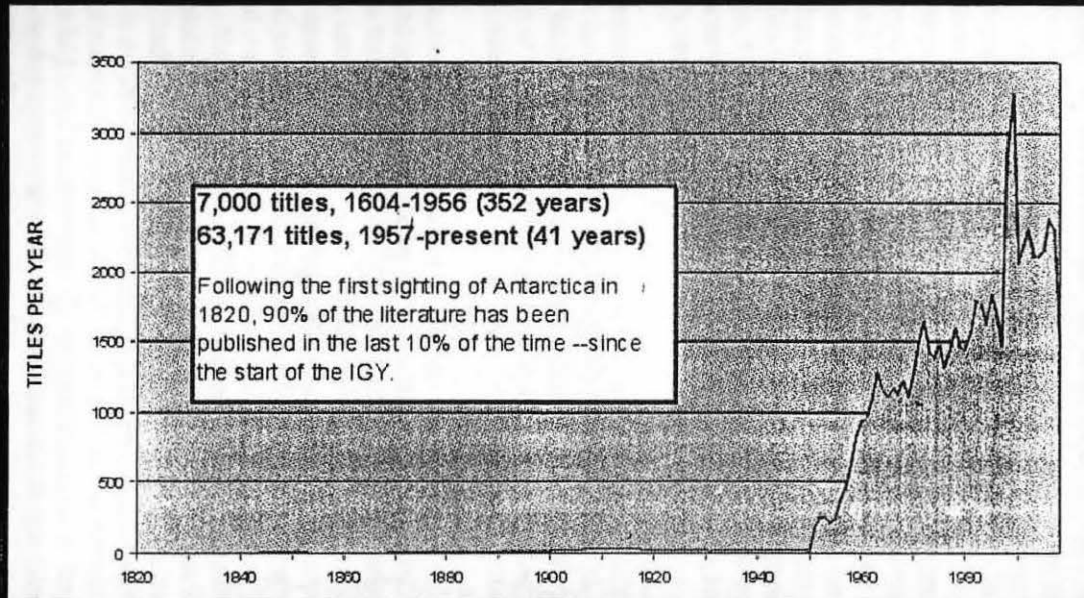
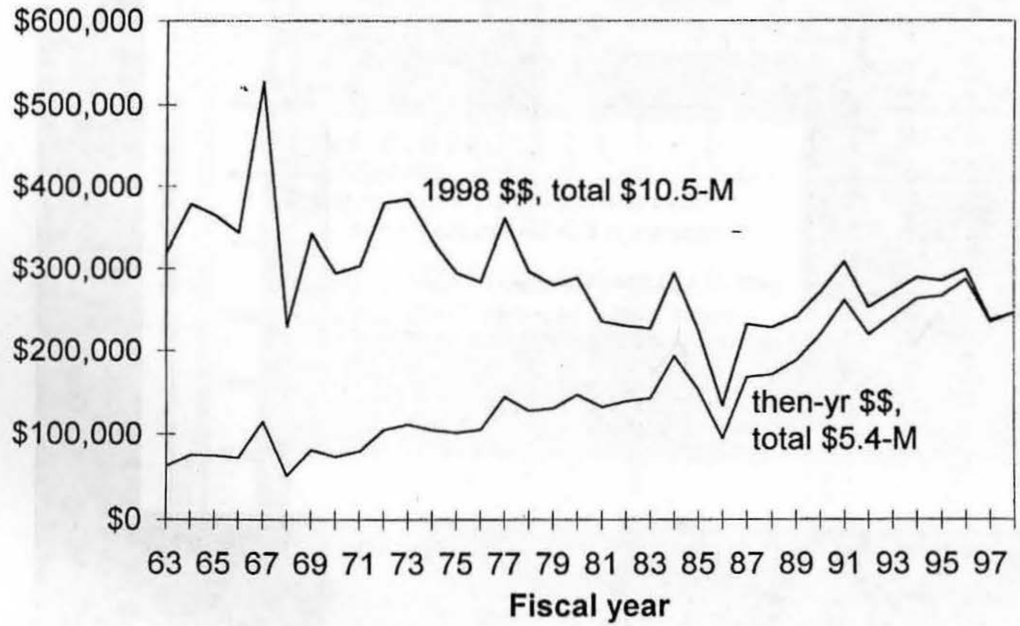
World's antarctic research literature



Bidders workshop
15-16 September 1998

LIBRARY OF CONGRESS ANTARCTIC BIBLIOGRAPHY, 1963-1998. NSF SUPPORT.



II. The Antarctic Document Collection

Since 1963, the Office of Polar Programs at the National Science Foundation (NSF) has supported the production of the *Antarctic Bibliography* by the Library of Congress—a list with abstracts of books, reports, journal articles and other documents about the Antarctic appearing in the world scientific literature. The *Antarctic Bibliography* is widely distributed among the research community. The bibliographic citations and abstracts are made available through the Library of Congress as part of the Cold Regions Bibliography Project at http://lcweb.loc.gov/rr/scitech/coldregions/welcome.html. New additions to the database are available monthly as the searchable *Current Antarctic Literature* at http://www.crrel.usace.army.mil/library/aware/antar31.htm), and in commercial databases such as *Arctic and Antarctic Regions*, vended by the National Informational Services Company (NISC). It is important to note here that although the *Antarctic Bibliography* is associated with the *Bibliography on Cold Regions Science and Technology,* it is not part of it, but is a separate entity produced by the NSF, not by the Cold Regions Research and Engineering Laboratory (CRREL), and with different procedures, specifications, and funding sources.

Accompanying the Antarctic Bibliography is a set of microfiche containing the full text of most of the documents indexed in the Bibliography—some 70,000 documents of all types and lengths. This microfiche collection is available in only six sets, located at NSF, the Library of Congress, an NSF center in New Zealand, and three NSF-funded research stations in Antarctica.

This is a truly unique collection of documents. The Library of Congress has been instrumental in helping the National Science Foundation to gather virtually all the documents that could be located by the joint efforts of both institutions. The collection policy has been to obtain by gift, purchase or loan any documents of any type that deal with any aspect of scientific information on Antarctica, either wholly or in significant part. Serial journals provide the bulk of the input, followed by monographs, technical reports and conference proceedings. A substantial amount of material is provided by other polar libraries, much in the form of "gray" literature. Commercial online services are also used to search for new material. In 1995 the Scott Polar Research Institute (SPRI) of the University of Cambridge began to contribute Antarctic materials for inclusion in the Cold Regions Bibliography Project (CRBP) database. Many of these documents are readily available in various library collections worldwide, many are less readily available, and in some cases the original document no longer exists in any collection or any format except for this collection of full text microfiche. These documents have been carefully indexed by a team of subject specialists at the Library of Congress, including the provision of existing author-abstracts or, when these were unavailable or insufficient, creating abstracts or enhancing existing abstracts. Approximately 2,000 new documents have been added to the collection each year.

NSF would like to expand the accessibility of these full text documents to make them available to a wider audience of researchers, and to make distribution and use of the documents easier and more efficient. We are very excited about this project. If looked at in terms of 1998 dollars, the NSF, through the years, has already invested $10.5 million in creating this bibliography and collection. What a tremendous resource for the world if all polar libraries, and all researchers, could have ready access to this unique collection!

Currently use of the documents requires storage of a bulky collection of microfiche and use of slow and inconvenient microfiche reader/printers. If a scientist does not have immediate access to one of the microfiche collections, a request must be made to obtain it through standard interlibrary loan options, or to purchase a copy of the desired document through the Photoduplication Service at the Library of Congress, which typically takes some weeks to fulfill the request in fiche or paper form. The Photoduplication Service is a cost-recovery based service of the United States government and the charges for production of a large document can be prohibitive. Since the documents are in microfiche format which is not searchable, a researcher requiring only limited information from a large document must purchase the entire document.

Additionally, copyright considerations make it impossible for NSF to distribute this microfiche collection outside of our agency.

Modern library technology and distribution networks now make it possible to store documents in a digitized format and to distribute them, on demand, electronically to any location with an Internet connection. This means that scientists who may not be working near one of the core microfiche locations, even those who may be at a field site or on a ship, could have access to the collection of documents at any time, without waiting weeks for access to critical information. Not only would this benefit scientists working through the auspices of the National Science Foundation, but it would open up the availability of this invaluable collection to scientists and students all over the world.

Additionally, documents in electronic format can be manipulated through various software programs to make searching for specific information, reformatting information, and personalized information storage possible. The use of these techniques greatly aids scientists in streamlining their research. These enhancements are not possible with microfiche.

The National Science Foundation envisions the transformation of this unique collection into a digital format. Ideally, this digital collection would be made available to any individual or institution with an Internet connection, and at a minimal cost. There are many important technical, legal, and practical considerations to such a project, however, besides the considerable hurdle of the initiation costs. The National Science Foundation itself does not have either the staff or the equipment to perform this digitization in-house, so we expect that this function will be done off-site under what we call a cooperative agreement with a corporation or other institution, using NSF funding. We hope to take advantage of innovative ideas of the private sector to maximize the format and access to this important collection of documents.

1. Technical Considerations

The first technical consideration is the electronic format into which the documents should be digitized. The Antarctic Documents Collection is not only quite large, it is also extremely varied in nature. Since the documents represented in the fiche collection consist of books, journal articles, technical reports, and a host of other publication types, virtually every combination of text and graphics is represented within the collection. For this reason, it is unfortunately impractical to consider either OCR or HTML as a process for digitization of this particular collection. Although both of these formats offer attractive features, particularly in searchability, the costs of either would be prohibitive. NSF has therefore decided the collection would best be digitized into either a simple TIFF format or a PDF format. Although the TIFF format has the advantage of being a universal, non-proprietary format, not all versions of Internet browsers currently support display of this format. The Adobe Acrobat Reader, for display of the PDF format, is free and readily available by download from the Internet, and, as discussed above, PDF is a very widely used display format with many attractive features. Both TIFF and PDF are readily convertible from microfiche images. The final selection of format has not yet been made. All of the above considerations will be taken into account.

The second technical consideration is the storage mechanism of the digitized documents. Since this collection already exists in microfiche format, we do not face the problem of archiving this retrospective collection. Although not totally stable, microfiche at this time is known to have a very long lifetime without degradation if stored properly, and since several sets are extant, there is sufficient duplication in the case of accidental loss. At this time, the preference for storage of the digitized product is through optical disks (CDs). Most optical disks at this time have a minimum life expectancy of about 10 years, multiple sets can be made inexpensively for distribution or insurance against loss or destruction, and, although technology may change, all likelihood is that the data on the disks will be readily convertible to new formats as future needs dictate.

A related technical issue is how the resulting database of digitized documents (or images) will be designed and constructed, and how it will be used. The options here are too varied to address in this paper, and will be determined by a combination of factors in which cost will surely be a major factor. Additionally, we hope that the polar library community, as primary potential consumers for these documents, will provide us with the information we need to assure that this product will match the technical and distribution needs and limitations that they face. However, the expectation at this time is that no matter what form the database takes, the documents will be keyed against the existing *Antarctic Bibliography* for retrieval purposes, assuring that there will be a wide variety of high quality access points to the documents and the information they contain.

2. Legal Considerations

The major legal consideration is, of course, copyright. The majority of documents in the collection are from copyrighted sources—journal articles, monographs, and many conference proceedings. These documents can not be reproduced or distributed without abiding by current fair use guidelines and copyright laws. Since the collection goes back to 1951 and comes from such varied sources, it is not possible to enter into agreements with each of the publishers or copyright holders for distribution rights by the NSF. This is a complex question with many ramifications on the methods NSF selects for distribution of these documents, and will probably mean there will be significant restrictions on our ability to deliver these portions of the collection to the user community. Fortunately, these are also the documents that are probably most easily obtainable by traditional interlibrary loan and document delivery options.

Other legal considerations are concerned with United States government policies and procedures and are not of general interest to the Polar library community.

3. Practical Considerations

The major practical consideration is the determination of the best distribution mechanism to make this collection available to the various libraries and researchers around the world. In order to make this proposed system work, NSF *needs* a great deal of input from the Polar library community. We must decide on a pricing structure which would be both acceptable to the user community and which would allow a minimum of maintenance costs to the National Science Foundation. In order to do that, we must know both the acceptable cost parameters of the user community and the expected volume of use of the system. In order to decide on the optimum technical configuration of the system, we need to know both the technical capabilities and the technical expectations of the user community.

As mentioned above, the *Antarctic Bibliography* is already available by free access on the WWW. In the best of all possible worlds, the NSF would make the entire document collection freely available full text on the WWW as well, but due to costs and copyright considerations this is not possible. The current vision for the full-text document collection is to have a web-based request form which would allow anyone needing a document to e-mail their request to a document delivery center. The document delivery center would be a non-profit, cost-recovery-based operation. If the requested document is not subject to copyright limitations, the document delivery center will provide an electronic copy of the document to the requester, either as a return e-mail attachment, by fax, by Ariel, or by posting in a web-based "mailbox". Depending on several factors, document delivery might be immediate or might be completed within 24 hours of receiving the request. For copyrighted materials, the user would be instructed to obtain the documents through normal interlibrary loan channels.

III. Is there a future for the *Antarctic Bibliography*?

As noted above, the National Science Foundation has been supporting the creation of the *Antarctic Bibliography* through the Library of Congress for over a quarter of a century. However, circumstances and funding are subject to change, and 1998 will be the last year for this program in its present form, and in fact the program may end entirely. The *Antarctic Bibliography* and *Current Antarctic Literature* could go the way of the *Arctic Bibliography*—forever invaluable, but no longer produced or updated after this year. Needless to say, this would be a tragic loss to the polar research community.

The NSF has a long-standing and continuing commitment to the support and distribution of these important research sources. The NSF is currently funding a project with the American Geological Institute to digitize and distribute the 16 volumes of the *Arctic Bibliography*. These volumes were produced between 1947 and 1975, are of continuing importance to the research community, and have never been reprinted. The copyright on these volumes is held by the Arctic Institute of North America, which has agreed to make this important work available at a nominal cost. The project is expected to be completed in 1999.

In addition, the Office of Polar Programs and the National Science Foundation Library have jointly sent me, as a librarian, to this conference to represent to you these programs and possibilities, to gather your ideas and input, and to work with you to establish a new cooperative partnership to preserve, disseminate, and, if possible, continue the organization and exchange of Antarctic information.

It would be a tragedy if we could not find a way to continue the *Antarctic Bibliography*. NSF is currently looking into continuing some form of the project as part of the larger effort of digitizing the existing Antarctic document collection. This possibility depends on a number of factors that are beyond the scope of this paper. However, one hurdle that we face is loss of the expertise and prestige leant by the Library of Congress towards procuring copies of the documents to be indexed in the bibliography. Traditionally, about 30% of the documents have come from the NSF itself, but a substantial and important number of documents have come through the efforts of the Library of Congress and of the Scott Polar Research Institute. SPRI has indicated their willingness to continue their cooperation with NSF in this effort.

We will also be losing the services of the team of experts the Library of Congress has provided which have constantly searched databases and other sources for new documents, indexed the documents, and either written abstracts or enhanced existing abstracts when necessary. The National Science Foundation does not have the staff to take over this function, but we believe we can commit to some large section of the funds that formerly went to the Library of Congress and make them available to a follow-on performer. We are also consulting with CRREL to coordinate with them on any future plans they may have for continuing the Cold Regions Bibliography Project.

We are currently looking into ways to make the current project more cost effective. We view this as an opportunity to rejuvenate and modernize document services that can be provided by this project to Antarctic researchers everywhere. We are considering the following possibilities:

1. Providing to the polar library community full text of all non-copyrighted items listed in the Antarctic Bibliography, through means discussed above.
2. Replacing microfiche of full-text with an electronic format.
3. Being selective of items chosen for full-text inclusion. For instance, eliminating full-text (while retaining the abstracts and indexing) of easily obtainable items such as articles from mainstream scientific journals.
4. Simplifying or eliminating the indexing and relying on key-word searching of abstracts and titles.
5. Building liaisons with other institutions for shared acquisition and processing of items of interest.
6. Using Internet and traditional tools to attract direct input of citations and texts from authors.
7. Setting up a Users Advisory Group of polar scientists and librarians.

The National Science Foundation is looking at this as an opportunity to rethink the project, to determine how it can be carried forward more efficiently, more cost-effectively, and in a way that invites participation of and distribution to the entire polar library community. We are hoping to be able to set up some kind of program whereby the entire polar library community can participate in the continuing production of this valuable bibliography by helping to provide appropriate documents and by lending your subject expertise and library skills as needed. By focusing the full-text document collection in future on the sources that are most difficult to obtain and making them available through a distribution medium, we could cut the costs of the program while providing a higher level of service to the polar research community. The *Antarctic Bibliography* itself would still continue to contain indexing and abstracts of all significant sources of relevant literature, although some compromises might have to be made on the level of abstracting and indexing provided. We hope that any of these compromises would be compensated for by the increased flexibility provided by electronic access and modern search software.

At this point we are in the earliest planning phases and frankly cannot make any promises, but we remain deeply committed to maintaining the *Antarctic Bibliography* at its present level of quality and an extended level of service if at all possible. Please join with us in this effort to continue this seminal resource.

We have already received from several institutions encouraging expressions of interest in working with the NSF to continue the Antarctic Bibliography. What we most need from the polar library community to make this effort a success is to work out a shared program for identifying and providing the relevant documents to be included in the bibliography and the digitized document collection, shared responsibility for maintaining enhanced abstracting and indexing that may require subject expertise, and your input on the best formats and methods to give both the bibliography and the document collection maximum distribution and usefulness.

One possibility is to create a web-based system for shared input of document information, based loosely on the model of the OCLC shared cataloging system in use in the United States and elsewhere. Using such a system, both libraries and individual scientists could share the responsibility of ensuring the completeness of the bibliography. Quality control would be maintained by systematic review of input before it is finally incorporated into the bibliography. Is such a system feasible?

We welcome your ideas and letters of support. We need your help. Please contact me at sbianchi@nsf.gov or Mr. Guy Guthridge of the NSF Office of Polar Programs at gguthrid@nsf.gov.

While the library and publishing worlds appear headed toward broad-scale solutions, based on the Internet, for future publications and collections, the valuable retrospective and continuing collection of the Antarctic Bibliography project dating back to 1951 merits special attention and all of our cooperative efforts to preserve and disseminate the existing resources and to continue to provide them into the future.

Name ____

Organization ____

Address ____

E-mail ____

1. Does your library/organization maintain a webpage available to the public?

   ___ Library ___ Parent Organization

   If yes, please give the URL ______________________________

2. Does your library currently provide access to the public to the Antarctic Treaty obligation reports and/or the SCAR reports

   ___ published by your own country?

   ___ published by other countries?

3. Do your patrons have access to the Internet

   ___ At their desktops? ___ Through the library only?

   ___ Through other sources ___ No access or limited access to Internet

4. What versions of web browsers do most of your patrons use?

   ___ Most current version of Netscape

   ___ Older versions of Netscape

   ___ Most current version of Microsoft Explorer

   ___ Older versions of Microsoft Explorer

   ___ Other browsers (please list):

5. Do you currently provide document delivery to your patrons in an electronic format?
Yes ___ No ___

Is/would electronic format be acceptable to your patrons? Yes ___ No ___

6. If you currently receive documents in electronic format, do you prefer:

___ as ASCII ___ as MSWord file ___ Other (please specify): __________

7. How many times, on average, do you request documents listed in the Antarctic Bibliography: (circle either month or year)

From the Library of Congress Photoduplication Service? ___ per month/year

Through Interlibrary Loan? ___per month/year

Through other document delivery services? ___per month/year

Please list other services used:

8. Do you regularly use any of the following services for interlibrary loan/document delivery:

___ OCLC ___ Ariel ___ WorldCat

9. Does your library currently pay fees for interlibrary loan and/or document delivery?
___Sometimes ___Frequently ___Never

10. If you currently pay fees, what is the average cost per document you currently pay? (Please indicate currency) __________

11. Which fee structure do you prefer:

___ Per page charge
___ Per document charge
___ Basic per document charge with added per page charge for documents over 25 pages.

12. Would you prefer to receive documents
___ By fax
___ By delivery to a temporary Internet mailbox
___ By Ariel
___ As an e-mail attachment

13. Would you prefer to send requests (if you have more than one choice, please prioritize)
___ As an e-mail
___ Through a Web-based form
___ By fax
___ By standard mail
___ As an OCLC request

14. Can your library/organization provide copies of documents to be included in the Antarctic Bibliography and the document collection?

____ By donation ____ Through loan only ____ Both

15. Can your library/organization provide indexing/translating/bibliographical expertise to the Antarctic Bibliography? Yes ___ No ___

If yes, please estimate man-hours per month that might be available ___________.

16. Please indicate languages for which you could provide translations of abstracts and/or bibliographical information: ______________________________

17. How important to you are the following:
(On a scale of 1-5, with 1=extremely important and 5=not important)

___Continuing production of the Antarctic Bibliography.

___Having records for monographic items from the Antarctic Bibliography input to OCLC/WorldCat.

___Having immediate access to full text of documents from the Antarctic Bibliography, as opposed to 24-hour access.

___Maintaining the current standard of 15 indexing terms per record in the Antarctic Bibliography, as opposed to relaxing the standards to 3-5 indexing terms per record.

___Maintaining the current indexing standard as opposed to eliminating indexing while maintaining search capability of title, abstract, and bibliographical fields.

18. Would you be willing to serve on a PLC committee to help work out the details of continuing the production of the Antarctic Bibliography and setting up the full-text delivery mechanism? ___Yes ___No ___Maybe—contact me later.

19. Do you have any specific ideas or comments on anything contained in this survey or not covered by this survey? Please write them on the back, or contact Sbianchi@nsf.gov

USING ARCHIVAL PHOTOGRAPHS IN A MULTIMEDIA REPRESENTATION OF THE HUMAN HISTORY OF THE UPPER ATHABASCA VALLEY

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ABSTRACT: The Upper Athabasca valley was the site of Metis habitation during the late 19th and early 20th centuries. These people left the area at the time that Jasper National Park was formed, however, their activities have left an enduring imprint on the landscape. Our research involves identifying and scanning archival materials, particularly photographs, related to the homesteads. The multimedia project provides an important representation of this historic human presence with the river valley environment.

KEYWORDS: multimedia, archival, photographs, Jasper National Park, Athabasca River Valley, Metis, landscape change

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INTRODUCTION

Over the summer of 1998, a team of researchers, working under the auspices of the Culture, Ecology and Restoration Project of the University of Alberta, developed a multimedia product to present the history of farmers in the Upper Athabasca Valley. The project focused on the use of archival photographs, mainly those available in the Jasper-Yellowhead Museum and Archives and the Jasper National Park Library. In dealing with the use of archival photographs in a multimedia environment, the team encountered several challenges and found several advantages to this format.

BACKGROUND

Jasper National Park

Jasper National Park is located approximately 350 km to the west of Edmonton , in the front ranges of the Rocky Mountains. It encompasses much of the Upper Athabasca River Valley. The park was created in 1910 by an act of the Parliament of Canada with a mandate to preserve and protect the wilderness aspects of the park. It is now one of the top ten tourist destinations in Canada and is world renowned as an ecotourism destination. Jasper National Park receives about two million visitors each year. The growth in the number of visitors is increasing exponentially. Most of the visitors do not venture beyond the easily-accessible front country. As a result, some of the most popular sites are suffering heavy user impact. Park Management is in the process of developing a new Management Plan for the Park.

Culture Ecology and Restoration Project

The Culture, Ecology and Restoration (CER) Project (http://www.ualberta.ca/~cerj/cer.htm) is a three-year joint research initiative between a consortium of researchers based at the University of Alberta, and Jasper National Park. The Principal Investigator is Dr. Eric Higgs (Department of Anthropology, University of Alberta).

The project is guided by two central questions:

1. What is the extent, character and ecological influence of past human activity in the montane valleys of Jasper National Park?

2. How can such historical knowledge of landscape change influence ecological restoration and management?

This multimedia project is one small part of the larger CER Project and addresses a very short time slice of human history in the Upper Athabasca Valley.

Farmers in the Upper Athabasca Valley

Although the Upper Athabasca Valley has been a peopled landscape for 8,000 to 10,000 years, the valley was largely a transportation route, rather than a settled area. During the late 1800's descendants of the fur traders, both native and non-native, and local native people began to settle in the valley and build farmsteads. In 1910, when Jasper National Park was created, these Metis farmers were removed from the valley and resettled in areas to the east and north of the park. There is little public awareness of the fact that people had lived in the valley prior to the creation of the Park.

MULTIMEDIA PROJECT

What is a multimedia product?

A multimedia product is one which involves the publication of a document which contains several kinds of media. These may include: text, audio, moving pictures, photographs, animation and maps. Our goal was to showcase as many photographs and related documents as possible within the theme of land use within the Upper Athabasca Valley and to supply as many logical linkages between the text and the photographs.

What are the issues surrounding the use of archival photographs?

1. Locating the Photographs

The first issue which we faced was the location of the photographs. The Jasper-Yellowhead Museum and Archives holds a collection of some 400 images. The Jasper National Park Library also holds a photographic collection. However, we became aware of the fact that not just photographs, but documentation in all forms about the Jasper area is held in archives and libraries across North America.

Much of the documentation related to Jasper National Park was created by visitors. Among these were the Hudsons' Bay Company, the Northwest Mounted Police (later the Royal Canadian Mounted Police), Canadian National Railways, various religious organizations, representatives of the Government of Canada, the Alpine Club of Canada, as well as many early painter, photographers, adventurers and explorers. All of these people visited Jasper and then returned to their homes and headquarters. Consequently, collections of documents and photographs relating to Jasper can be found in Montreal, Ottawa, Winnipeg, Edmonton, Calgary, Victoria, and various locations in the United States. Much documentation also still exists in private collections.

2. Copyright

In Canada, copyright on photographs "exists for the remainder of the calendar year of the making of the initial negative or plate, or, where there was no negative or other plate, the making of the initial photograph, and 50 years thereafter".

Creators also have three moral rights which remain with them, even when copyright is reassigned. Moral rights pass to heirs, even if they do not inherit the copyright. These rights may be described in the following way:

1. No one may distort, mutilate or otherwise modify a work in a way that is prejudicial to the honour or reputation of the creator of the work.
2. The creator's name must be associated with the work, if reasonable in the circumstances.
3. The work may not be used in association with a product, service, cause or institution in a way that is prejudicial to the creator's honour or reputation without the creator's permission.

For published works, copyright extends for the life of the author plus 50 years. If photographs are published, they may not be copied from the published document without permission of the copyright holder, even if the copyright on the original image has expired. However, the original image may be copied. (Canadian Intellectual Property Office, 1994)

Because most of the photographs which we wanted to use were taken in the period from 1880 to 1930, copyright had expired on them, so the right to copy was generally not an issue. However, in many cases we were not able to observe the moral right of identifying the creator of the work. For many of the photographs, neither the photographer nor the donor of the photographs was known.

3. Obtaining permission and cultural sensitivity

Most of the individuals who appeared in the photographs have been dead for many years. However they have many descendants among the Metis communities in Western Alberta. We consulted the Metis Association about the appropriateness of using photographs. We received counsel which told us that as long as the photographs had been deposited with an archives and they were used in a respectful way, there was no need to consult further. The only photographs which raised any concerns were those of graves. For these, some people felt that family members should be consulted, although the concern seemed to focus on recent burials. The grave images which we used included a non-native grave and an image of the grave of an esteemed Metis woman, which we determined had been previously published.

4. Respectful Use

One of the unusual aspects of our project was the fact that we were often more interested in what appeared in the background of a photograph than in the foreground. Often the subject of the photograph was a person, but not the focus of our use of the photograph. While it would have been most respectful to identify the individuals in the photographs, in some cases, we were not able to do that.

In organizing our multimedia product, we also considered the issue of respectful display of photographs on the screen. We decided not to make pages which had to be vertically scrolled to display all of the text so that the images would always be presented intact. In that way, at no time would the bottom half of an individual's body be presented on the screen. Instead, we made sequential pages, which were linked by icons indicating that there was more information available.

5. User fees

As a result of government cuts to funding of archives within the Province of Alberta, many of the archives have instituted user fees for the publication of photographs, whether or not the archives owns the copyright to the photograph.

While I am sure that this has been hotly debated among the members of the archival community, from the perspective of the user, these fees have a chilling effect on the use of the material. If the copyright on a photograph has expired, the fees can be avoided if it is possible to locate a copy of the same photograph in an institution which does not charge fees or in private hands.

One of the determining factors in our project swiftly became whether or not we would be required to pay a use fee.

Use fees for the primary archives from which we might have chosen to use photographs are as follows:

Glenbow Institute	- $ 10.00
Jasper- Yellowhead Archives and Museum	- $ 10.00
National Archives of Canada	- $ 00.00
Provincial Archives of Alberta	- $ 150.00 (black and white) $ 300.00 (colour)
University of Alberta	- $ 00.00 (academic use) $ 50.00 (black and white - commercial) $ 300.00 (colour - commercial)

What are the Issues Relating to Scanning and Importing Images?

1. Scanning density

One of the secondary goals of our project was to supply back to the Jasper-Yellowhead Museum and Archives an archival-quality image of any photographs which we used. While the normal density required for print and publication is 300 dots per inch (dpi), files created at this density are quite large. The normal density used for screen display is 72 dpi, with resulting smaller files. To resolve this dilemma, we scanned the photographs at 300dpi, saving them in TIF format and then re-saved each image at 72 dpi in the JPG format.

2. Cropping and altering photographs and historical fidelity

Our goal was to tell the story of this part of human impact on the environment by allowing people to see the impact in the photographs. We wanted people to be able to see the photograph in the same way that they would see it if they went to the Archives to look at the original print. To achieve this, we did very few alterations. Alterations were restricted to edge-cropping and changing contrast, gamma, shadow and sharpness to achieve the best clarity in the photograph. There were no changes made to the content of the photographs, except that sometimes parts of the photo which were not visible in the original became visible in the computer image.

In working with archival photographs, it is not uncommon to find images which are poor quality or in poor physical condition. In some cases we chose to use photographs which were damaged and to show them damaged, so that people would recognize that they were viewing an unaltered image.

What are the Advantages of Using Multimedia for Archival Photographs?

Multimedia formats have several advantages for archival photography. First, it allows for relatively inexpensive storage, preservation and presentation of photographs. Presenting images electronically allows many people to use them without wear and tear on the original.

It also allows for relatively inexpensive distribution of images. Compared with printing a picture book, the cost of delivering electronic image products is relatively low.

The multimedia format also allows us to solve some of the frustrations involved in handling photographs. Printed materials are necessarily linear. In presenting information about a photograph in a print document, it must be placed near the photograph and the user is required to make the connections. In the multimedia format, it is easy to place an invisible link on top of a person or an object in a photograph and have the information automatically appear in a pop-up box when the cursor crosses that link.

Similarly, in print media, indexing is necessarily textual. For example, where a photograph shows a number of people and an extensive accompanying text describes those people, usually indexing would be supplied in the form of a list of names with page numbers. In the multimedia format, the photograph itself can be the index. A link can be made directly from each individual to the text about that individual.

Other kinds of archival documentation can also be easily integrated, including images of documents, such as birth or death certificates, or sound recordings by or about the subject.

While the image quality will never be as good as the original image, multimedia offers some definite advantages for the presentation and distribution of archival images.

Choices for Publication

We considered the Internet as a method of publishing this product and finally resolved to publish it in compact disc format. The advantages of web publishing are that the content is easily updated. However, Internet delivery requires both computer space and ongoing maintenance. Further, there is less opportunity for cost recovery.

Compact disc is a more permanent form of delivery, but has to be updated as a new version or edition. However, compact discs also demand a certain level of technological knowledge by the user. Unlike the purchasers of books, CD users expect publishers to supply ongoing help support for their products.

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THE RAGNAR LASSINANTTI COLLECTION AT LULEÅ UNIVERSITY LIBRARY

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ABSTRACT: Luleå University of Technology is the only University of Technology in Sweden with such broad scope in its education and research. We conduct research within the Faculty of Engineering and the Faculty of Arts and Sciences. We provide education in the spheres of engineering, the social sciences, the humanities, teaching, music, media education, and drama. We have about 8,500 students enrolled and a staff of 1,200. In addition to the main campus in Luleå, we have campuses in Piteå , Kiruna and Skellafteå.

Luleå University Library. The new building of the University Library at Luleå was inaugurated in August 1994. The library building has an area of 7000 m^2 , of which 1100 belong to the Computer Support Centre and the rest belongs to the library. The location of these two facilities in the same building is fruitful.

The Ragnar Lassinantti Collection. Luleå University of Technology acquired the Ragnar Lassinantti Book Collection in the autumn of 1990. The collection consists of about 13,000 volumes, most of which are works of fiction and works on history, social science, geography, the history of literature, art and religion. The main focus of the literature in the collection is on Nordic conditions, including the Sami (Lapps) and the Laestadian movement. The collection not only contains literature in Swedish, but also in all of the other Nordic languages, especially Finnish. The archival material that belongs to the collection includes about 600 audio tape recordings. The tapes contain Ragnar Lassinantti's radio recordings for the radio program Pohjoiskalotti, which mostly consist of interviews with people from the Arctic regions of Fenno-Scandinavia and the Kola Peninsula.

Introduction

In August this year I participated in IFLA's satellite conference on the indigenous peoples of the world, entitled "Library Services to Indigenous People." The conference took place in Tromsø in Northern Norway. In the Nordic countries today there are two projects which focus on the future of the Sami Bibliography. On the one hand there is a

Swedish project and on the other hand a Nordic project based in Jokkmokk and being conducted within the framework of the Berenice Network. (Margareta Raattamaa will tell you more about the Berenice Project.) I am a member of the reference groups of both projects.

The Nordic reference group held a meeting one day before the IFLA conference. At that meeting I was appointed "ahkku," which is a Sami word meaning "grandmother." A representative of the first nation peoples in Canada, Jim Bruce, described in detail how they still choose an elder. He or she does not actually have to be the oldest person, but must be wise, possess a great deal of experience, and be someone whom people listen to. I interpreted the first nation peoples' custom of electing an "elder" to be similar to the old Sami custom of electing an "ahkku."

When Jim Bruce explained the role of the elder of the Canadian first nation peoples at the IFLA meeting, I understood that they and the Sami share a common view of the "elder" or "ahkku." This means in our context that, when the younger members of the Sami reference groups are engaged in an animated discussion and I wish to enter the discussion and express my opinion, I only have to stand up. Then everyone stops speaking to listen to what I have to say!

Who am I?

I am an information specialist at Luleå University Library. At the moment I am working at the reference service and teaching information retrieval to students at the Faculty of Engineering.

One of my special interests at the Library has always been the very far north. I attended my first Northern Libraries Colloquy in Tromsø in 1982. Luleå University Library organized the Northern Libraries Colloquy in Luleå in 1986. For those who know me from the '80s, for ten years I was working outside the Library in different projects concerning research in cold regions, women and technology, and a women's university.

Since 1995 I have been back at Luleå University Library. Today I am still active in issues concerning the Arctic. I am chairwoman of the Nordkalott Literary Society. As I told you above I am engaged in drawing up the future plans of the Sami Bibliography.

Previously one talked about "Nordkalotten," which still denotes the Arctic regions of Fenno-Scandinavia (Norway, Sweden and Finland) and the Kola Peninsula. Ragnar Lassinantti included Iceland in the term. The term "Nordkalott" is now often replaced by the term "Barents Region," in phase with the current increase in our cooperation with Russia.

In the present paper I am going to talk about the Ragnar Lassinantti Book Collection at Luleå University of Technology, about Ragnar Lassinantti as a person, and finally about the digitization of Ragnar Lassinantti's audio tape recordings.

The Ragnar Lassinantti Collection

Luleå University of Technology acquired the Ragnar Lassinantti Book Collection in the autumn of 1990. The collection consists of about 13,000 volumes, most of which are works of fiction and works on history, social science, geography, the history of literature, art and religion. The main focus of the literature in the collection is on Nordic conditions, with about 2,000 volumes treating the Arctic regions of the north, including the Sami and the Laestadian movement. The collection not only contains literature in Swedish, but also in all of the other Nordic languages, especially Finnish. The archive material that belongs to the collection includes about 700 audio tape recordings.

Ragnar Lassinantti

Ragnar Lassinantti (1915-1985) was a Social Democratic member of the Swedish Parliament from 1957 to 1966. Between 1966 and 1982 he was the County Governor of Norrbotten. In both his roles, as member of parliament and County Governor, he worked without respite for the development of Norrbotten and for a closer co-operation between the regions above the Arctic Circle in the northernmost part of Europe. He was unique in many ways. One example is that, while he was a member of parliament, he was also the producer and anchor of Pohjoiskalotti, the Swedish Broadcasting Corporation's (SR - Sveriges Radio) first radio program in Tornedal Finnish, the language spoken along the Torne River Valley.

The Nordkalott concept

Although Ragnar Lassinantti was a Social Democrat, he took a very independent stance with regard to the party, which was unusual in Swedish politics at that time. He had a deep knowledge of the history, culture and languages of the northern regions. The north was important to him, far more than questions concerning the south. In 1972 he referred to "Nordkalott" as "perhaps the only area in the world where three nations, four languages, and five peoples (the Finnish, Norwegian, Sami, Swedish and Tornedal peoples) live in concord without support from the United Nations." In 1977 Ragnar's dream of a Nordkalott conference in Iceland came true. About 80 delegates came here to Reykjavik from Sweden, Norway and Finland, among them the County Governors of Nordland and Lapland.

The most radical of all the Nordic conferences was the one that took place in Piteå in 1962. That conference ratified a plan for concrete Nordkalott co-operation. The Nordkalott Council for Cultural Affairs was established. Books started to spread across borders and libraries started to co-operate. Ragnar Lassinantti also took the initiative in establishing the publishing house called Tornedalica.

The Nordkalott Library Conferences

The first conference was held in Kirkenes, in Norway, in 1971. The next ten years there were conferences in Kiruna, Sweden and twice in Rovaniemi, Finland. Since the conference in Vadsø, Norway, in 1983, there have been conferences every second year in Sweden, Finland, Russia and Norway. The conference in Archangel last year had a program entitled "Environment, libraries, knowledge." The next Barents Region Library Conference is to be held in Mo i Rana in Norway in May 1999. The program comprises themes such as roots and genealogical matters, Sami library services, libraries for young people, and local surroundings and the media of the future. In addition there will be social activities and some lectures that will present some radical outlooks.

Ragnar Lassinantti as a bibliophile

He was really a man of eloquence and liked to make speeches and converse with people. When he prepared a speech he generally lay down and planned his speech on the bed. He had a photographic memory and an outstanding ability to read huge texts and select the most important information he needed at any given moment.

Once he received the following question in an interview: "Do you read all the books you acquire?"

"Almost all of them," he replied, "I read about one book a day."

"Can that be possible, with all your work and all your assignments?"

"No, but I skim through them and read what I consider worth reading."

When asked the question, "Which three books would you bring with you to a desert island?" he immediately mentioned *The Bible* and *Encheiridion : manual of study in the art of living* by the Greek slave and philosopher Epictetus. His third choice was *Kamaripirtiltä* by the Tornedal author William Snell. He said that he sought strength and consolation in books.

Luleå University of Technology

During the 1960s, Ragnar Lassinantti was strongly committed to the establishment of a university in the County of Norrbotten. Luleå University of Technology is the only University of Technology in Sweden with such broad scope in its education and research. We conduct research within the Faculty of Engineering and the Faculty of Arts and Sciences. We provide education in the spheres of engineering, the social sciences, the humanities, teaching, music, media education, and drama. We have about 8,500 students enrolled and a staff of 1,200. In addition to the main campus in Luleå, we have campuses in Piteå , Kiruna and Skellefteå. In 1981 Ragnar Lassinantti received an honorary doctorate from Luleå University.

The Nordkalott Collection

The Lassinantti Collection is an integrated part of the Library's other collections. It is catalogued in the database of LIBRIS, which is a national bibliographic network serving Swedish university and research libraries. All of the books belonging to the Lassinantti collection receive a special code that facilitates searching. The greater part of the collection can be borrowed by patrons of the Library. This would probably have been completely in the spirit of Ragnar Lassinantti, who was a great proponent of adult education. At present the Nordkalott Collection contains about 6,500 volumes, covering all aspects of this subject area, and it is a collection that continues to grow.

Digitization

One of the projects currently being conducted by Luleå University Library is the digitization of Ragnar Lassinantti's audio tapes in cooperation with SR.

The archive material that belongs to the Nordkalott Collection includes about 700 audio tape recordings. The tapes contain Ragnar Lassinantti's radio recordings for the radio program Pohjoiskalotti, which mostly consist of interviews with people in my valley, the Torne River Valley. The name of the language spoken in the program is "Meän kieli." It is a language spoken in the Finnish-speaking areas along the Torne River Valley in the county of Norrbotten and is very much related to the language of the "Kväner" in Northern Norway.

The aims of the digitization project are the following:

- to make the Lassinantti tapes available for research and the general public,
- to choose material for some form of electronic publication on the Internet, through co-operation between Luleå University Library and SR - material treating two main themes: on the one hand some renowned personality from the Nordkalott regions, e.g. Laestadius, and on the other hand "Women in the Arctic regions of Fenno-Scandinavia and the Kola Peninsula,"
- to utilize the digitized tapes to produce radio programs to be broadcast by the local radio station "Norrbotten Radio," the Finnish-speaking channel in Sweden "P7," and the Finnish Broadcasting Corporation (Yleisradio),
- to catalogue and index the tapes according to the "Dublin Core" to facilitate information retrieval,
- to investigate the possibility of starting an audio museum in Luleå, in memory of Ragnar Lassinantti at Luleå University Library.

SR has been broadcasting "Pohjoiskalotti" since the beginning of the '60s. SR owns the contents of the tapes and is entitled to use them and broadcast them, i.e. SR owns the so-called "signal rights." SR's Finnish-speaking channel, "P7," is interested in digitizing the tapes to preserve them and use them to make new programs. Luleå University Library wishes to keep the tapes in its Lassinantti Archive. The copyright legislation applies to recordings of authors, musicians, singers, etc., but not to recordings of ordinary people.

The tapes are being digitized and transferred to streamer tapes. These are a kind of tape that can be used to store both sound and text. SR and the University Library will each receive their own copy of the tapes. The Library's copy will be used for research on and in the Barents Region. The right to electronically publish SR's material on the Internet belongs to SR alone. However, the University Library can create links to SR's Internet pages. We can also come to an agreement on the Internet publication of short samples of the recordings.

Technical requirements

Juha Tainio, who works for SR's Finnish-speaking channel, "P7," has been involved in the project entitled "Multimedia Digital Archive and Work Station for Producers of Music Programs." The aim of the project is to develop a mobile unit for the collection of sound and text for storage on streamer tapes (tapes for storage of 26 hours of linear sound). The advantage of the system is that one can store both sound and text, i.e. a typescript, working material, and sound recordings, including the actual program broadcast. The material thus becomes retrievable in the same way as in Microsoft Word. The corresponding sound files are of the ".wav" type and the sound management program is called Sound Forge. Tammerfors University's Audio Tape Archive, the Finnish Broadcasting Corporation, certain Finnish archives and SR are investigating and developing a technique for digitizing audio tapes.

Cataloguing and indexing the material

We paid a study visit to the Norwegian National Library in Mo i Rana on 28th May 1998, in order to find out how the Norwegians digitize sound recordings. They presented a project entitled NDLC (the Nordic Digital Library Centre), which is a centre of expertise in the area of digital libraries. We also received information on the "Digital Radio Store," a project involving co-operation between NRK (the Norwegian Broadcasting Corporation) and the National Library in Mo i Rana, concerning the digitization of radio programs. In addition, they presented a joint project conducted with Iceland and entitled "Antique Maps of Iceland."

During our study visit to Mo i Rana, our hosts emphasized the importance of cataloguing and indexing the material in phase with the actual digitization to provide the optimal and most efficient information retrieval. From the beginning our plans have included the creation of metadata on the basis of the Dublin Core. The Nordic Digital Library Centre at the National Library in Mo i Rana has published "Guidelines on the Establishment of Digitization Services." The experience of the National Library of Norway strengthens our ambition to allocate an equal amount of resources to cataloguing and indexing on the one hand, and to the technical conversion on the other hand.

Welcome to "Nordkalotten" and thank you for listening!

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THE DIRECTORY OF U.S. ARCTIC RESEARCHERS: THE PROCESS OF DEVELOPMENT

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ABSTRACT: The Arctic Research consortium of the United States undertook the compilation of a comprehensive directory of U.S. arctic research. After investigating the process, it was realized that the project was too extensive to undertake in one effort. It was decided to break up the work into manageable phases. Careful planning went into determining the type of information to be included in the directory, how that information would be collected and presented, and the phases in which the directory would be developed. The result has been a printed directory and a fully searchable online directory. The directory continues to grow and change as ARCUS continues working toward the original goal, and responds to the input of the research community.

Keywords: arctic research, directories

In 1994, the Arctic Research Consortium of the United States (ARCUS), in response to the stated needs of its members, decided to compile a directory of U.S. arctic researchers and research institutions. The goal was to produce a complete source for locating researchers, research organizations and facilities, funding organizations, education programs and institutions, and arctic logistics information. ARCUS planned to aggressively locate and compile this information for publication in a printed directory, which would be updated, on a regular basis. After some research, ARCUS staff determined that this project exceeded available funding and decided to undertake the project in sections. Each section would take into consideration the most pressing needs of the arctic research community, available funding level, and related types of information to be collected. Each phase was planned with the final goal in mind. Continuing update and publication of the information was included in the planning.

Phase I:

ARCUS limited the first phase of the directory to ARCUS member institutions. The directory would include information about the arctic research units of the member institutions, including contact information, researchers, research projects, special facilities, and organizations with whom they collaborate. Information gathered about the researchers would include contact information, subject specialty, current research projects and areas of interest. This directory would be published and distributed within 14 months. The goal was to have the directory published by March 1995.

It was decided to take a more passive approach to the research, using survey forms to gather information, and relying heavily on the member representatives of each institution to provide lists of names to contact. The member representatives would also encourage researchers at their institution to respond to the survey.

A month by month timeline and plan, with estimated hours required for each person involved, was drawn up.

In order to proceed, it became necessary to define who was a U.S. arctic researcher. We decided on the following definition: U.S. researchers doing work anywhere in the arctic, non-U.S. researchers doing work in the U.S. arctic or being funded for arctic research by an U.S. organization, and government officials involved in funding and overseeing arctic research. Principal researchers, faculty and agency researchers, and post docs in stable research positions would be included. Graduate students and post docs in a nonstable research position would not be included.

Geographic area was determined as well, and included the traditional Arctic (north of the Arctic Circle), the Bering Sea, glaciated areas, and Alaska subarctic areas when the research has implications for arctic research.

The initial directory would be divided into 3 sections: research institution information, researcher information, and index of researchers by subject specialty.

The computer database was set up on Filemaker Pro, which is a powerful integrated database program. Special attention was given to setting up the data fields. The fields were set up for ease of exporting the data into a publication format, and full searchability of data when an online directory would be set up in phase II of the project. Also of concern in field layout was the need for manipulating data for lists and reports on the project, merging information into letters and envelope labels, keeping track of the sources of information, and dates that information was input and updated.

A standardized format was set up for all input into the system, in order to ease the editing work necessary after the massive export of information for the final layout, and to have standard appearance to phone numbers, state and country designations, divisions and departments of government agencies, etc. No abbreviations or acronyms were to be included, because the directory was intended to be an international resource.

ARCUS staff decided to include subject specialties and current research as separate items thus including "what researchers were" and "what they did." The specialty covers "what they are", i.e. an anthropologist. Researchers can also select a subject specialty in which they are not doing current research, or in which they are considered specialists. Current research indicates work they are doing when the survey was submitted. Later, in the online directory, specialties allowed the controlled subject type of search, while current research allowed the keyword/natural language searching.

It was decided to establish a list of subject specialties, requiring respondents to choose a specialty rather than use their own wording. This was done for two primary reasons. A Subject Specialty Index was planned for the printed version of the directory, which required standardization of the specialties in order to create a useable index. This approach avoided the problem of sorting through the many ways that a specialty can be stated, and trying to group them for the index. It also addressed the problem of researchers defining their specialties too finely, for example researchers defining their specialty as "micrometeorites" when "meteorites" was on the list.

The specialties list was started with standard sources of disciplinary specialties such as the AAAS specialty list, and included lists from other specific research directories, and lists of science subjects. The survey form asked researchers to suggest a specialty if they felt that they were not adequately listed. Then each of these suggestions was evaluated carefully before adding. Often "see" notes were added from nonused terms pointing to accepted terms. One person maintains the subject specialty list, in order to maintain the integrity of the list.

The researchers provide current research descriptions. They are short single sentence statements. The staff does not edit them unless they are too long for the layout needs of the printed format, or they include acronyms that must be clarified. Again the layout of the information input in the database is carefully controlled in order to allow direct data exportation into the final print layout without excessive editing being required.

The process of gathering information was helped in this phase by the involvement of the representatives of the ARCUS member organizations. They provided the information for the institutional section of the directory. The survey form sent to them solicited information in the format used in the final directory layout. They were encouraged to submit information electronically (e-mail, computer disk, or file transfer.) This allowed insertion into the directory with only minor editing necessary.

Member representatives also provided lists of other arctic researchers, and their e-mail or mailing address. These researchers were then sent a survey form. A letter sent with the form explained the nature and plan for the directory, and requested that they provide us with names and contact information of other researchers that should be included. The member representatives and ARCUS staff made follow-up contact to those who did not respond. An unusually high response to the mailed survey forms was observed (approximately 50%) possibly attributable to the efforts of ARCUS member representatives, and the fact that researchers were motivated to be listed in the directory. The response to the e-mailed surveys was about 85%. This may be because it is easy to put a printed survey in a "to do when I have time" stack, and then forget it. One must consciously delete an e-mail message

ARCUS staff reviewed the forms, and e-mailed or phoned for clarification if necessary. New names of researchers at the member institutions were sent forms, and researchers at other institutions were held for phase II of the project.

Final editing and layout was a time consuming task. Even with the care we took with database layout and input, copy and content editing took more time than was anticipated.

The Directory of U.S. Arctic Researchers: a preliminary compendium was published in January 1995. It contained 21 research organizations and 471 researchers.

As soon as phase I of the directory was finished, planning for the next phase began. This phase involved new planning and new goals, and expansion of the range and breadth of the directory.

Phase II

Phase II of the directory expanded the content to all research organizations in the United States that were doing arctic research, to include universities, institutes, state and federal agencies, local governments, businesses, and native organizations. Arctic post secondary education programs were added. The researcher section was expanded to include all arctic researchers in the U.S., and non-U.S. arctic researchers who are funded by U.S. funding agencies or are doing research in the U.S. arctic.

The expansion of the directory content meant that a more aggressive approach had to be taken to collect information. This included searching the *Research Centers Directory* and *The World of Learning*, and other directories to locate institutions with arctic interests. Information provided by our member institutions proved useful, as well. Alaska state agencies and local governments were contacted to ascertain which units carried on research in our area of interest, or provided oversight to research. Mail, fax, and e-mail were used to send explanatory letters and the survey form. Frequently a trail of referrals was followed before finding the person who could provide the information needed. Some institutions had to be contacted for updated information, because we had added education programs to our directory and started including web homepages.

Individual researchers also required a more extensive search. ARCUS maintains an extensive in-house database of people interested in arctic concerns, and was able to draw upon that heavily. Researcher recommendations, professional association directories, conference attendee lists, NSF grant recipients directory, and other directories were also used. As the work progressed, and more organizations put their staff lists on the web, online institutional directories proved to be very useful to locate researchers and to directly link to their e-mail addresses.

Due to the difference in response rate of regular mail and e-mail communications, it was decided to expend the effort to find e-mail addresses to which to send the survey. This meant many hours searching online staff and faculty directories, or extrapolating possible addresses from known elements and trying them. This has proved a very successful method.

A separate database of dual appointments was linked to the main database. The search software of the directory database was set up to search both databases and return both appointments with a search.

One interesting problem was that researchers with government agencies felt that they did not qualify for the directory since they were not university research faculty. Or they felt that they were just counting wolves and establishing range, not doing true research. They often needed to be convinced that they were researchers and that information should be in the directory as a resource for other researchers.

At this time planning began to create a fully searchable on-line directory that included the most used portion of the directory (the individual researcher section).

The Web Directory: http://www.arcus.org/US_Arctic_Researchers

The development of the on-line version of the individual researcher section of the directory has been a very successful and satisfying project. It turned this section of the directory into a dynamic living entity. And as such it is the most useful part of the project. Within 5 working days of receiving a survey form and approving the person for the directory, he/she is listed on the web for anyone looking for someone doing that type of research.

This portion of the directory took the most collaboration within our organization. Kristian Bergdahl, (and later Milo Sharp) our computer specialist, worked with the computer technical end, with me as the staff librarian and project coordinator looking at the online directory from the user's point of view, and Wendy Warnick, ARCUS Executive Director, looking at it from the organizational perspective. There were many discussions about how something could be done most efficiently from the technical point of view, and what is most user-friendly from the people side.

The web directory pages include an explanation of the directory and why it has been put together. It also includes a survey form for individual researchers to submit in order to be included in the directory, and a survey form for research institutions to submit for inclusion in the institutional section of the directory. The information from the survey forms goes to a staff member to evaluate and upload into the database. It was deemed too risky to allow direct entry of information into the directory by persons outside the ARCUS organization.

A very flexible search screen allows the searcher to input any information that he knows would be in particular fields. He indicates if that field will have exactly those words, just contain those words or strings of letters, begin with those words, or end with those words.

Almost every field in the database is searchable. So if someone is looking for Smith who is an ethnographer, or for a climatologist who works in Barrow, he can just input what he knows and find everyone who matches.

The original database was uploaded first, then weekly updates added the new researchers, as they were located. So this is a very timely data set. Researches are requested to review their entries annually to ensure that the data are still correct.

As of this date there are 1629 researchers in the online version of the directory.

Because of the careful preplanning that we had done, the directory fields were moved easily into the software chosen for the web version. The software for the database is Filemaker Pro 4.0. Our web server is running Starnine's WebSTAR Web server software. The web server itself is a Power Macintosh G3/300 minitower from Apple.

This has been a very successful project. By taking on the work in sections, ARCUS was able to produce a valuable research tool successfully, which otherwise seemed beyond reach. The result is a very powerful and usable online directory, which is updated weekly. The directory will continue to grow and change as the needs of the research community demand.

WHAT WE LEARNED FROM FRANKLIN'S FIRST EXPEDITION ON CD

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ABSTRACT: Saving printed material as electronic files appeared to answer all our prayers: lower production costs, saving of shelf space, easy transmission and sharing of material and, with the evolution of Internet, global access to source material. That was the theory but in practice three issues emerged as stumbling blocks: The cost of conversion, the authenticity of electronic files, and the permanence of the electronic media.

There are two approaches to electronic document storage.

Early efforts of electronic storage resembled medieval scriptoria. Modern day scribes set down at their word processor and copied (retyped) manuscripts. The oldest of these projects (Project Gutenberg) is still going strong. The spin-offs include a major effort of various Electronic Text Centres (ETC) to use special coding (SGML) to render electronic text as a faithful copy of the original. While many librarians seem to be committed to this approach, we believe that the progress in information technology offers a better approach.

The second approach substitutes electronic imaging for photo reproduction (microfilm). We explore this second approach through a case study of converting Sir John Franklin's "Journey to the Shore of the Polar Sea" (London, 1823) to a CD-ROM.

Professional scanning equipment makes it possible to produce high quality electronic images with relative ease, except that for the best results the pages should be loose so that bound books cannot be used. The electronic images can be greatly enhanced by adjusting brightness and contrast, by cropping and sizing, de-speckling and de-skewing. The purpose of this electronic processing is to get an image that can be successfully recognized by the Optical Character Recognition (OCR) software, and requires a minimum of editing to remove "suspect" words.

Converting the image to recognized text has several advantages and at least one disadvantage. The main advantages are the ease of reading the text on the computer monitor, the word search capability, and the ability to extract portions of text for pasting in other documents. The disadvantage is that the processed text may have diverged from the original and is no longer its true representation. It is easy, however, to provide links to images of original pages for verification.

Reading an electronic book should be an experience similar to reading a paper copy. Thus one should be able to go to the Table of Contents to select a desired chapter, browse through pages or go to an index, and examine the illustrations. This can be accomplished by using "navigation buttons", and considering carefully their design and typical usage.

Finally, one of the reasons for using Franklin's "Journey ..." for this pilot project was the desire to evaluate the quality of reproduction of the engraved illustrations which represent an important feature of this work. By experimentation we have developed techniques to render these illustrations as faithful reproductions of the original, as will be demonstrated at the Conference.

ARCHIVAL DATA PROJECTS

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ABSTRACT: This will be a report on two archival data projects undertaken at the Hancock Library of Biology and Oceanography of the University of Southern California to improve access to both textual and visual archival data owned by the Library. The first project was to digitize unpublished station data for use in a relational database. The second project was a prototype of a system for accessing photographs and negatives. The methodologies for selecting, designing, executing, and evaluating these two projects will be discussed.

PROJECT 1 STATION DATA

Background

Within the Hancock Library of Biology & Oceanography's archival files are the original station data for the voyages of research vessels sponsored by the University of Southern California. The data used for this project were collected during voyages of the *Velero IV* from 1948 to 1983 and include standard parameters such as station number, latitude and longitude, location, wind direction and speed, depth, equipment used, specimens collected, etc. (See Figure 1 Sample Station Data Sheet.) Researchers who use these data are often working with specimens collected during the voyages. The station number is part of the identification of the specimen and is marked on the specimen itself, a tag on the specimen or the specimen container for microscopic specimens. The number allows the related data to be retrieved. This level of detail is not available from any other source than the station data sheets. Significant collections of specimens from these voyages are permanently housed at many institutions including the California Academy of Sciences, the Los Angeles County Museum of Natural History, the Santa Barbara Museum of Natural History, the Smithsonian, and others. Researchers from all over the world have consulted or borrowed specimens over the years.

Subsets of the data have appeared in various publications of the Allan Hancock Foundation, but the information in the total data set, or simply a single specific station entry, is only available by direct request to the Hancock Library. Although some of the researchers who use these data have requested improved access, nothing had been done to make available all the data collected by the *Velero IV*. In the 1980's there was an attempt to microfilm the data sheets, but this was not technically feasible due to the condition of

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the originals. Many of the data sheets are much too light to be microfilmed clearly. In the summer of 1995 the Library was given $2000 through the College of Letters, Arts, and Sciences (LAS) of the University to be used within one year to support a student to enter the data into a database and make the data not only more accessible, but to allow more modes of access than simply by date or station number.

Execution of the Project

There was no money allotted for additional equipment or software. We wanted to use a relatively basic program that would be available over time and would be easy for the researcher who would use it later. After some investigation of what was available, Microsoft Access® was selected for the relational database program. Since this was the first time I had used this database software, I was able to obtain some assistance in setting up the data entry form to make it easy to enter the data and be assured that no data elements were being omitted. A random sampling of the original data sheets was examined for data elements needed to create the template. (See Table 1 Data Elements for the Station Data Project.)

Table 1
Data Elements for the Station Data Project

Cruise Number
Recorders
Date of Cruise (MM/DD/YY)
Time Zone
Station Number
General Locality
Gear Used
Starting Latitude, Longitude, Time and Depth in fathoms
Ending Latitude, Longitude, Time and Depth in fathoms
Direction of Travel
Wind Direction and Speed
Remarks

Over the next year two students in succession were hired for this project. Their job was to do the data entry. Data entry was difficult for many reasons. The terminology was unfamiliar to the students and the original data recorders varied in their skills. Sometimes the recorder was a scientist, but often they were members of the ship's crew. Problems included handwriting, varieties of spelling or abbreviation of place names, samples, and equipment, and fading of original sheets over time. (See Figure 2 Sample Data Entry Record.) When the students had a question they recorded it on a log for review. (See Figure 3 Sample Log Page.) I soon learned that it was necessary to deal with the questions from the log quickly, but I also learned I needed to proofread all of the entries. Quick response to questions limited the number of repetitive errors. Proofreading was necessary for two reasons: 1. The original data sheets were difficult to read and 2. The mind-numbing nature of data entry in itself caused multiple errors.

The first student hired worked during the summer of 1995 for about twenty hours a week. When she resigned a second student was selected to work on the project. This student worked for ten months, only nine of which was paid from the original funding. Because all the original funding had not been spent within the original twelve-month period, I applied to continue over the summer of 1996. LAS granted this, so the entire time was a total of fifteen months. There was not active data entry for all of the months because data entry was suspended while undergoing the searches for the student assistants. After the funding ceased we were able to hire the second student as a regular Hancock Library student, but she was not able to include very many hours on this project in addition to standard student responsibilities. (See Table 2.)

Table 2 Project Hours

Time Period	Student Hours	Librarian Hours	Funding Source
FY96 Q1	79	20	LAS
FY96 Q2	126.5	16	LAS
FY96 Q3	105.3	17	LAS
FY96 Q4	73.9	46	LAS
FY97 Q1	77.5	9	LAS
FY97 Q2	4	8	Library
FY97 Q3	0	0	Library
FY97 Q4	0	3	Library
FY98 Q1	0	4	Library
FY98 Q2	0	0	Library
FY98 Q3	0	6	Library
Total Hours	466.2	129	

What did I learn from this project?

First, data entry was much slower than was predicted before the project began. Approximately 40% of the data were entered during the entire funding period.
Second, it took many more hours of my own time than originally thought. The proofreading was extremely time consuming. The time expenditure was approximately four hours of student time to one hour of mine. I learned how far behind in proofreading the students' work I could get without causing a scheduling problem for myself.
Third, I had to coordinate my schedule carefully with the student. During the funding period the software was only available on one machine in the library and that machine was on my desk, so I had to vacate my office for them to do their work efficiently.
Fourth, the selection of students was very important. The first student (Student A) only worked during the first summer, but I hired her because she came highly recommended and had data entry experience. Unfortunately, her data entry experience was all with numerical data entry. The second student (Student B) turned out to be better at data entry where the data are not all numerical. Differences between the students included background (Student A was an engineering student, Student B was pre-nursing so had

taken more science courses), keyboarding skills (Student B typed faster than Student A), and personality (Student A was less willing to ask questions than Student B, which may have been a cultural difference). Language difficulty was less understanding of English than of the scientific terminology used. Neither student was a native English speaker. Fifth, I needed an advocate to get the original funding. LAS gave the original $2000 at the request of one of the research faculty. Since there then was an approved project, I was in position to request the extension in time. This extension kept the project going for an additional three months with no increase in the total funding committed.

Currently the project is at a standstill. There is an opportunity for additional funding; however, some of the "cast of characters" has changed. I will be continuing to work on the project, but there are new people in the coordinating roles for the administration and LAS. The requesters remain the same. The people still highly interested are the original requesters, including the requester who lobbied for the original funding. The completion of this project looks highly probable with additional funding to support it. The expanded access to the data could make this attractive to be used in environmental research to be able to compare current conditions with conditions at these locations up to fifty years ago.

Results

The project is not completed, but an excellent start has been made. Due to the size of the data set, the original plan to make the data available on disk has changed somewhat. This has been driven by changes in technology as well. The present data set, and the entire data set when completed, will be available in the Microsoft Access® format as designed; however, the size of the data set has caused a change in the archiving media from multiple floppy disks to a single zip or CD-ROM disk. The original requesters want the data to be published in print form as well although the expanded searching capabilities of the software would be unavailable in a hard copy format. Publication will depend on the extent of future funding although the first priority is digital access.

PROJECT 2 PHOTO ARCHIVE

Background

The second project was a joint project that was the result of a class. In fall of 1993 the USC Center for Software Engineering under the leadership of Prof. Barry Boehm experimented with a master's level class to focus on skills that students would need in the real world software engineering environment. (Boehm et al. 1998) Although the end result would certainly require programming and design, the course uses the WinWin® (Horowitz 1996) theory and software tool to help the students understand roles of the software architect, the developer, the customer, the user, etc. in a software development project. (See Table 3.) From 1993 through 1996 each student on the team was assigned one of the "stakeholder" roles although all were to participate in the programming

Table 3
What is WinWin?

WinWin is a computer program that aids in the capture, negotiation, and coordination of requirements for a large system. It assumes that a group of people, called *stakeholders*, have signed on with the express purpose of discussing and refining the requirements of their proposed system. The system can be of any type. WinWin contains facilities for:

1. capturing the desires (win conditions) of the stakeholders
2. organizing the terminology so that stakeholders are using the same terms in the same way
3. expressing disagreements or issues needing resolution
4. offering options as potential solutions
5. negotiating agreements which resolve the issues
6. using third party tools to enlighten or resolve issues
7. producing a requirements document that summarizes the current state of the proposed system
8. creating documents that support multimedia and hyperlinks
9. tracing the ways by which requirements decisions were reached
10. checking the completeness and consistency of requirements.

and writing of documentation. The application of the WinWin tool encouraged the refining process. Prof. Boehm found that the students tended not to ask the questions that a "real" customer or user would ask. In Fall 1996, Prof. Boehm worked with two library faculty (Julie Kwan and Denise Bedford) to recruit projects with a library faculty member as the "client" for the students. It was also felt the library faculty might have a better understanding of what the "user" would need. For the fall 1996 class the library faculty members interested in participating prepared a brief abstract to apply to work with the students. (See Table 4 Hancock Photo Archive.)

Table 4
Problem Set: Hancock Photo Archive

There is a substantial collection of photographs, slides, and films in some of the Library's archival collections. As an example of the type of materials available, I would like to suggest using the archival collections of the Hancock Library of Biology and Oceanography to see if better access could be designed. Material from this collection is used by both scholars on campus and worldwide. Most of the Hancock materials are still under copyright, but the copyright is owned by USC in most cases.

For each abstract the two library faculty, along with Prof. Boehm, determined general feasibility before offering the abstracts to the students for their selection. In fall 1996 there were fifteen teams of six students each. The teams were self-selected. Each team applied for assignment to one of twelve projects based on the abstracts submitted by the library faculty. Prof. Boehm approved the student assignments to a project. The Hancock Photo Archive project was one of three projects assigned to two student teams. Each team had to do a separate project without consultation across teams. Over the semester I met with each team separately and discussed the primary needs of the project, was presented with sample screens and programs and attended class presentations on the various projects. I also participated in the evaluation of the two teams that worked on my project. Results from one of the teams were selected for presentation to the Dean of the Library. This is the project that will be discussed here.

Execution of the Project

The final required document for the student projects is a *Life Cycle Architecture Package*. This is the most complete documentation for a project. Most of the discussion of the project is based on this documentation. The students named their project the Hancock Digital Multimedia Archive System or HDMA. I quote here from their documentation with additional comments from me in brackets:

> "The purpose of the Hancock Digital Multimedia Archive (HDMA) System is to replace the labor intensive, manual system of organizing and cataloging the photographic materials in the Hancock collection with a multimedia capable computer based system. This system will facilitate access to the information and will make the collection available to a wide variety of users. [The archive occupies approximately ten filing drawers, two shelves, and four racks of film canisters. The photos are in better order than either the films or the slides.]

The primary objectives of the system include:

1. To provide a means for the Hancock Library of Biology and Oceanography to organize and catalog the collection of photographs, films, and reports from the Hancock expeditions. [Reports were not an original part of this project, but reference to the reports with abstracts was intended to be included if the project was accepted for further development.]
2. To make the catalog and photographs available to students, researchers and the public via the Internet.
3. To create an electronic backup of the photographs in the collection to safeguard the information in the event of a disaster. [This was very important to the students.]

The Hancock collection consists of thousands of photographic slides, negatives, film and reports that were recorded during the various Hancock scientific expeditions of the

1930's [into the 1980's, but the bulk of the materials are from the *Velero III* voyages from 1931 until World War II, so their date is close]. The photographs are a priceless record of the research conducted during the voyages and were donated to the Hancock Library in the 1950's [actually donated sporadically over the entire time the photographs were taken]. The collection has never been properly cataloged, hence access to the collection's photographs is poor and a valuable source of research is underutilized.

The Hancock Digital Media Archive will provide the means for librarians, students and researchers to browse and/or query the collection, from anywhere in the Internet, in order to locate an item of interest. The system will provide a means to locate items based on various attributes such as subject, photographer, date, etc. In addition, the system will provide a digital image of the photograph of sufficient resolution to identify the subject. This image will contain a USC copyright notice in order to protect the rights of the University. A means to order a print of any desired photograph or report will be provided. [Ordering of reports was an enhancement the students strongly felt was important as this process is completely manual.]

Finally, the HDMA system will create a backup of the material in the collection. "In the event of a disastrous earthquake, or other calamity, the priceless record of the Hancock expeditions will be preserved." (*Life Cycle* 1996)

Negotiations between the team and me continued through the fall semester. Specific features or functions were agreed upon and the students developed a "proof-of-concept" prototype. The system was required to display text and static images with a thumbnail image and a larger image with a copyright statement superimposed on the image to protect it. (See Figure 4 Sample Archival Copyright Photograph.)

A means of requesting a copy of the image without the copyright statement was built into the system although credit card payment was not a feature as the University would not permit it. The system had to be easy to use, allow browsing the images as well as searching, use existing computing infrastructure of the University, be accessible through the Internet, and be able to adapt to the Library's database management system (SIRSI). A separate controlled password-only access by the librarians in Hancock would allow the capability to add, update, or delete records. The system had to "provide search results in 10 seconds 90% of the time [and] must be able to download a 30KB image file in 30 seconds 90% of the time." (*Life Cycle* 1996) It also would detect errors due to communications problems, servers, etc.; be expandable in the future to include dynamic (video/film) media; and provide ordering capabilities.

Additional features were considered but rejected in this phase, such as full text of reports and film digitization. The large amount of storage for digitizing film was not available to the project, but was considered as a future enhancement. Digital cash was also considered as a future enhancement when the University allowed it. With the current system for providing photographs from the collection, most of which still have not been digitized, an estimate of photographic reproduction was also not feasible at the time.

Features of the administrative program were limited to the Hancock Library. (See Table 5 Administrative Module Features.) The subject terms were free text and entered by the librarian in the administrative mode. Generally these were intended to be accessible by a non-scientist, so species were not always entered. The photo archive did not usually contain this information, so addition of this would require supplemental work by the librarian in conjunction with an appropriate scientist and was determined to be a future enhancement if later found necessary. Subject terms were easily edited by the librarian and some hierarchical group terms were added as needed, e.g. if the subject was dolphins, then marine mammals was used also. In the case of the prototype, the students sometimes used their own somewhat casual terminology, e.g. "bunch of dolphins at sea."

Table 5: Administrative Module Features

Edit Photograph Records	Generate Alphabetic Pages
List Photograph Records	Generate Report List
Edit Report Records	System Reports
List Report Records	Online Help
Edit Subject Word List	Go to the HDMA home page

Features of the Internet access mode would be available to anyone. (See Table 6 Internet Access Digital Multimedia Archive Features.) The searching access allowed the user to restrict a search by subject, date, or place. Place was a textual search, such as Guadalupe Island, not by longitude and latitude as that was generally not available in the photo archive. The user also could search photos, reports, or both. The default was photos.

Table 6: Internet Access Digital Multimedia Archive Features

Search Archive	View Order Form
Browse Photos	Process Order
Browse Reports	Online Help

The fall semester class (CS577a) is a core course in software engineering, but the spring semester (CS577b) is not. The second semester class is much smaller and similar projects were combined. Of the twelve projects from the fall, six were selected for continuation in the spring. This was based primarily on the interests of the continuing students and not necessarily the librarians' priorities. Of the membership of the two Hancock teams, only one student enrolled in the spring class. The project was combined with two other image-based projects with the lead taken by the project whose members were in the majority. Although it was not intended, major points of the two other projects, including the Hancock project, were lost in the spring results. (Boehm et al. 1998) This included the copyright notice and some of the searching options, such as photographer and date. Since these were class projects, University Computing automatically deleted all the projects without consultation with the faculty. As of spring of 1998 the projects were thought to be archived, but that was found not to be the case when I requested the project prototype. What is left is a large amount of written documentation, but none of the computer programs are viewable. Since all of the students have completed their degrees and left the

University, I have been unable to contact any of the students to see if they archived any data themselves.

What did I learn?

First, this was as much a learning process for the development of the course as a prototype development.(Mankin 1997) Due to the protocols then in place for class projects the prototype was not retained on the university's computer. This is no longer true. All projects are now to be retained for future revisiting.

Second, since the Hancock teams' students did not return for the second semester, the planned continuation of the project with enhancements did not occur. Combination of teams that had the same project is now acceptable for the spring semester, but not trying to combine different projects. All the image projects that year were not compatible. Too many elements of the individual projects were lost.

Third, there has to be significant "buy in" by the University Library for a project to continue. For the most current class year 1998-99 the project selection and support has begun to be institutionalized. New people in the R&D unit are involved and funding for some continuation is provided.

Fourth, I learned as much about the process of negotiation for a software engineering project as the students did. We each had to learn about the other's terminology.

Fifth, the time invested was worth it to me to bring focus to a needed function within the Hancock Library, i.e., better organization and access to non-text archival material. Access to original research data is a current interest within the University Library in its new identity. (See Results section below.) Because I worked with these archives, I have a better knowledge of their organization and arrangement. For example, the description of an image is often separate from the image, particularly for negatives.

Sixth, problems were identified in the technology. The materials include photographs, standard slides, glass slides, 4x4 negatives, and films. Treatment of each of these materials is different, so we started with the easiest, the photographs. Availability of a scanner was also a problem. The scanner available was best at photographs and either could not scan other formats or did not handle them well.

Seventh, the possibility of revisiting earlier projects is now an option. With the changes in the structure of the class the image project could be revived and the printed documentation in hand will be invaluable.

Results

Unfortunately for this project the only tangible result is the printed documentation. Essentially all computer programming would have to be redone, although the code was submitted as part of the class. The class has been revised and possibilities of funding for future projects are now in place. Due to a reorganization on campus in fall 1997, there are closer relationships between the Library and University Computing. They are combined, along with Telecommunications and Student Information Services, into the current Information Services Division (ISD). The reorganization includes an R&D unit that is involved in selection of projects for the software engineering class. This should make development of future projects more viable. There is also an interest on the part of the head of ISD, the Chief Information Officer, in making original data available.

Conclusions

Both projects were worthwhile applications of my time and effort. Although neither has been fully developed, both have given visibility to the Hancock archival collections on campus that would be difficult to achieve in any other way. Possibilities for future work in these areas still exist. The increased interest in original data may work to the advantage of these projects or future projects in these areas. So far, on campus focus on original data has been on social sciences and humanities, but this science data archive is one that has good development potential.

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Figure 1
Sample Station Data Sheet

The University of Southern California

Allan Hancock Foundation

VELERO IV STATION LOG

ptain Allan Hancock, commanding | Recorded by

ise			Month					Year					Time Zone
62			April					1951					+8

ta. No.	Date	General Locality	Gear	Start Lat. N.	Start Long. W.	Start Time	Start Fms.	Finish Lat. N.	Finish Long. W.	Finish Time	Finish Fms.	Bottom	Remarks
	Apr.												
210	13	Hassler Cove, San Martin Island, B. Cfa.		30-29	116-06-06	1100	shore			1200		Rock	Reef and Tidepools
212	13	Lagoon, San Martin I.		30-28-49	116-06-27	1230	shore			1330		Rock	Lagoon
213	14	Rocky Point San Quintin Bay		30-22-50	115-59-45	1030	shore			1130		Rock	Rocky outcrops in lagoon
214	14	Inside San Quintin Bay	boat dredge	30-22-50	115-59-90	1400	4½	30-24-35	115-59-10	1530	2½	Sand, Sh	Ulva, Sand dollars, Broken Shell
215	14	Bahia San Quintin	night light	30-21-45	115-57-15							surface	
216	15	164° 13 miles from San Geronimo I.	Sigsbee Trawl	29-35-30	115-44-15	0900	48	29-34-15	115-43-00	0940	49	rocky	Tore up Sigsbee Trawl. Lost buoys & chain.
217	15	163° 14.3 miles SE of San Geronimo I. Baja Calif.	Biol. dredge	29-34-15	115-43-00	0945	53	29-33-45	115-42-45	1005	54	Green mud	
218	15	Blanca Bay	Biol. Dredge	29-05-41	114-41-56	1700	12	29-05-47	114°-41-23	1709	8	fine sand	
219	15	Blanca Bay	Biol. dredge	29-05-59	114-41-15	1729	8	29-06-15	114-40-57	1734	6	Sand	Sand dollars
220	16	Scammon Lagoon	boat dredge	27-50-45	114-17-40	1400	4	27-49-00	114-17-45	1500	6	sand	Dead shell
221	16	Shell Island, Scammon L.		27-50-30	114-5-30	1430	shore			1500	shore	sand	Pectens & gastropods
222	17	Point 10 mi. W. of Pt. Malarrimo		27-49-00	114-43-00	1000	shore			1230	shore	rock	Reef & Tidepools. Rich
223	17	" " " 4	lobster pots	27-48-03	114-42-08	1800	5	18	April	0600	5	rocky bottom	
224	18	9.5 miles West of Pt Malarrimo	Biol. dredge	27-48-33	114-42-30	0914	7	27-49-00	114-42-09	0922	9	rocks sand	
225	18	10 mi. W. of Pt. Malarrimo		27-49-00	114-43-00	1130	shore			1330	shore	rock	Reef & Tidepools
226	19	So. Bay Cedros I. Mex	Biol. dredge	28 05 00	115-19-45	1035	16	28 04-49	115-19-24	1046	19	mud sand	
227	19	" " " " "		28-05-55	115-20-10	1200	shore			1400	shore	rock	Reef & Tidepools
228	20	2.5 miles 133°T from Morro Redondo Pt. Cedros	Biol. Dredge	28-00-47	115 09 00	1035	33	28 01-03	115-08.42	1041	34	Sand	Solid Ophiothrix Brittle stars
229	20	2.6 miles 131°T from Morro Redondo Pt. Cedros	Sigsbee Trawl	28 00-47	115 08.56	1055	34	28 01 07	115-08 40	1115	35	Sand	Solid Ophiura & Ophiothrix
230	20	5.4 miles 093°T from Morro Redondo Pt. Cedros	"	28 02-23	115-06-08	1148	40	28-02-27	115-05-36	1210	41	green mud	Coelenterata
231	20	N. end of Cedros Island		28-21-30	115-11-45	1430	—			1630	—		Land collecting Helix

Figure 2: Sample Data Entry Record

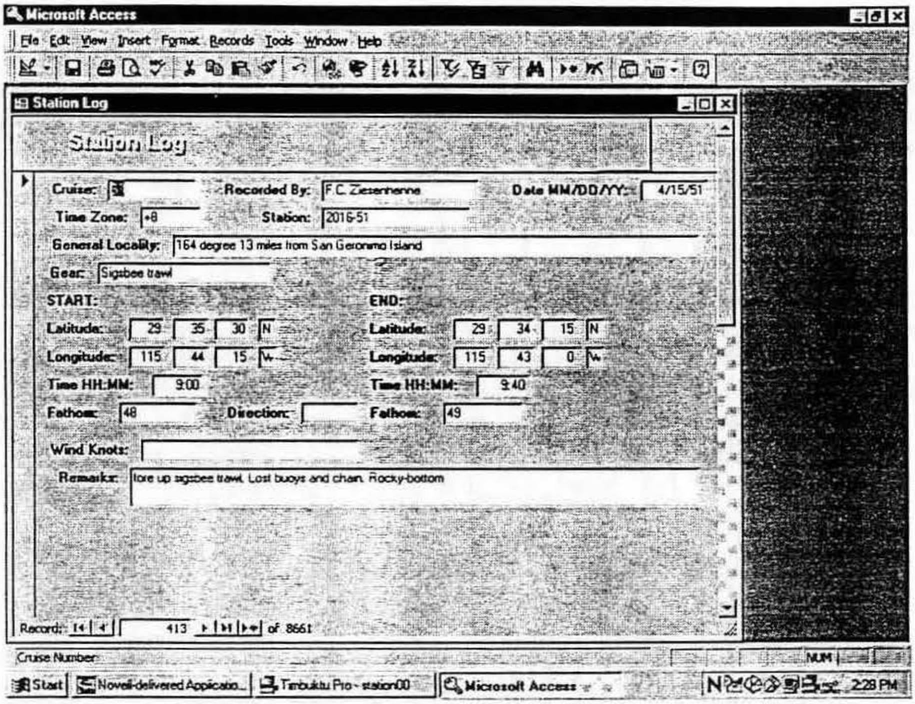


Figure 3: Sample Log Page

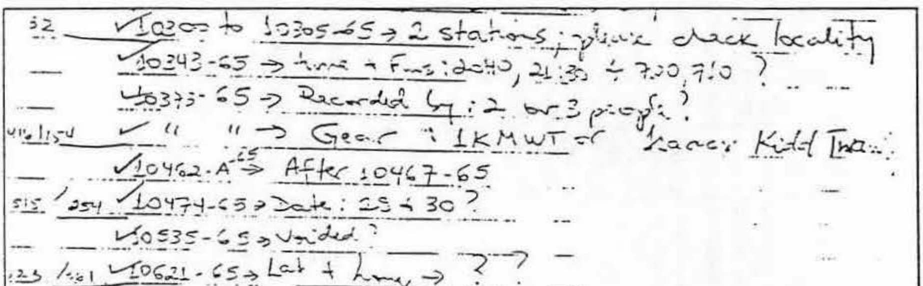
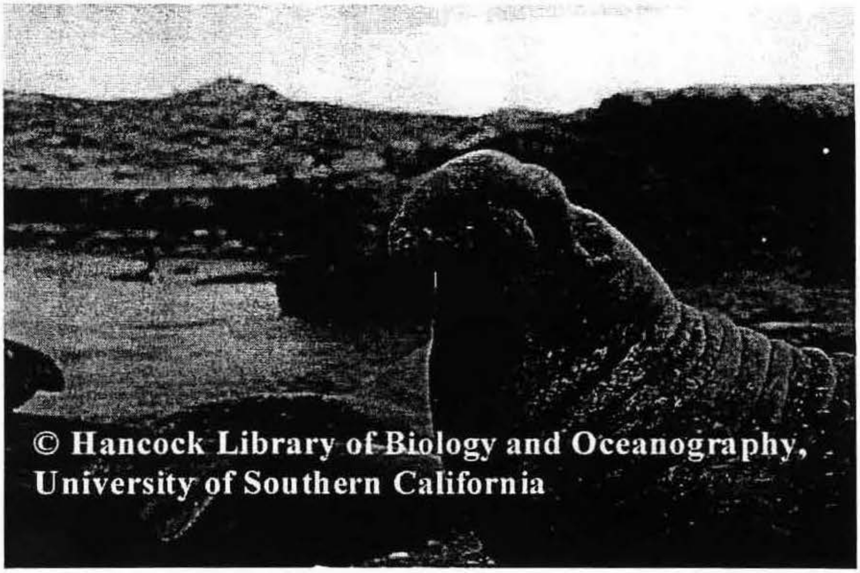


Figure 4: Sample Archival Copyright Photograph



CHALLENGES OF DEVELOPING ELECTRONIC CATALOGUE OF HOLDINGS OF MARINE SCIENCE LIBRARIES IN THE WESTERN INDIAN OCEAN REGION

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ABSTRACT: The Intergovernmental Oceanographic Commission of UNESCO in 1989 initiated the programme on Regional Co-operation in Scientific Information Exchange in the North and Central Western Indian Ocean region (RECOSCIX-WIO). The objectives of the programme were to improve access of marine scientists in the region to up to date scientific literature; to publicise marine research work undertaken in the region; and to promote communication between scientists in the region, and between them and scientists from outside the region. One of the activities initiated by RECOSCIX-WIO was the development of catalogues of holdings of marine science libraries in the region so that the information in them could be accessed easily and be used as a collective resource. Nine institutions in six countries (Kenya, Madagascar, Mauritius, Mozambique, Seychelles and Tanzania) were provided with equipment and training to enable them develop their library databases. The results of this effort have been mixed. This paper presents a comparative analysis of the development of the library databases in each of the institutions and recommends measures which can be taken to improve on the implementation of the project As a preclude to the second operational phase, the project co-ordinator and the project manager of RECOSCIX-WIO undertook a mission to Eritrea, Kenya, Madagascar, Mauritius, Reunion (France), Seychelles and Tanzania to evaluate the use and appreciation of RECOSCIX-WIO services and products and to access the capacity available for the data management in the co-operating Institutions of RECOSCIX-WIO.

Introduction

The advancement of science is unthinkable without continuous and efficient exchange of data and information. There will not be much relevance in developing scientific programmes and in undertaking scientific research activities unless the research findings can be communicated to the scientific community. This therefore calls for the need to develop capacity in collection, analysis and distribution of data and information. Modern scientific research basically relies on the ability to communicate; gather reliable data; have access to the relevant information. The pace and complexity of modern research have greatly increased the communication needs of researchers, and scientists. The provision of appropriate information systems and services for this group of information generators therefore becomes apparent. This can only be done through strengthening of national scientific capabilities for data collection and analysis, building of the appropriate library infrastructure, creation of national databases, linking of these databases to the existing data and information services and developing mechanisms of co-operation with a view to exchange data and information services.

A lot of initiatives have been set up out in Africa by both national and international agencies, to develop infrastructure and human capacity building in support of research and information provision. Each of these initiatives has met its own successes and challenges. This paper gives an overview of a regional project: Regional Co-operation in Scientific Information EXchange in Western Indian Ocean (RECOSCIX WIO) in trying to establish a regional database of marine literature for the collective use in the region and elsewhere. The project, however, also provides information services to the marine scientists in the region.

Network

The Western Indian Ocean region (WIO) research fraternity consists of 9 countries and nearly 300 scientists in 43 institutions. There are approximately 30 co-operating libraries in these countries and over 700 contacts in nearly 50 countries. The network is co-ordinated from the Regional Dispatch Centre (RDC) node, which manages the flow of information to and from the region. The RDC is based at the Kenya Marine and Fisheries Research Institute in Mombasa, Kenya. The WIO region is also the Science community of the member states of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCINCWIO). These include France (La Reunion), Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia (currently inactive) and Tanzania.

History of the Project

RECOSCIX-WIO Project was borne out of the Second Session of the Intergovernmental Oceanographic Commissions (IOC) Regional Committee for Co-operative Investigations in the North and Central Western Indian Ocean Region (IOCINCWIO-II) held in Arusha, Tanzania in 1987, where a proposal for the development of the project was adopted. This project was to assist in providing bibliographic search facilities and scientific literature. IOC was requested to provide support for a two-year pilot phase of the project.
The Project was launched 1989 with Kenya Marine and Fisheries Research Institute (KMFRI) as the host institution. KMFRI provided support staff and the necessary basic infrastructure. IOC provided an Associate Expert and funds to assist in developing the project. Limburg University Centre (LUC) provided crucial support in the development phase of the project. RECOSCIX started with bibliographic searches and document

delivery to the scientists in the region. In addition a newsletter WINDOW was launched to provide the scientists with a forum for exchanging ideas and getting information on marine science activities both within and outside the region.

At the end of the pilot phase, a five-year operative phase of the project running from 1991 -1995 was initiated with funding from Belgian government. LUC was designated as the discharging agency of the Belgian Government. IOC and SAREC continued to provide substantial support to the project. During this phase the project provided training and equipment to the libraries of marine science institutions of the region. The project continued to provide the bibliographic search and document delivery services introduced in the pilot phase. The libraries of the co-operating institutions started in the development of catalogues of their holdings to be merged into a regional database called WIOLIB (Catalogues of holdings of marine science libraries in the Western Indian Ocean Region). A directory of marine scientists in the region (WIODIR) was also published with support from UNEP.

The third session of IOCINCWIO, held in Mauritius in December 1992, recognised the contribution the project had made to the development of marine sciences in the region and on this basis requested the Belgian Government, IOC and other countries/organisations to continue supporting RECOSCIX-WIO and assist in expanding its scope to include data management, which was identified as an area requiring critical support.

The second operational phase running from 1996 - 1999 was approved and was to address data management, and assist member states in the region to develop national oceanographic data centres and the individual scientists in accessing data available locally and in international data centres.

Objectives

The RECOSCIX-WIO was established to meet a number of objectives among which are: providing marine scientists of the WIO region with the necessary bibliographic and scientific literature, making full use of the scientific literature available in the WIO region, promoting and facilitating communication between marine scientists in the WIO region, promoting and facilitating communication in the WIO region and other regions, promoting the scientific activities of the WIO marine scientists within and outside the WIO region and providing scientific information, equipment, software and training to make full use of this information.

Activities:

In RECOSCIX-WIO I the emphasis was on library activities and building capacity in the region to administer libraries efficiently using computer tools. . Other activities led to the compilation of a list of marine scientists and institutions in the region and the publication of the regional newsletter for marine scientists. During the phase II of the project, more emphasis is placed on the management of information and scientific data. During 1996/7 a new set of activities was undertaken, the compiling and collation of scientific baseline information. These data will be distributed, together with the earlier data products of RECOSCIX-WIO on a single CD-ROM.

The Regional Dispatch Centre undertakes a number of activities to fulfil the aims and objectives of the RECOSCIX Project. Services given to co-operating and associated institutions include document delivery and query handling. WIO Current Products are distributed in the region (WIODIR, WINDOW) (WIOLIB, CD-ROM); specific activities are aimed at enhancing communication and data exchange between scientists in the region (ODINEA). The RDC also acts as the regional input centre for Aquatic Sciences and Fisheries Abstracts (ASFA). From the onset of the project, RECOSCIX has relied on UNESCO's CDS/ISIS Software as a data management tool. Most of the databases are developed using it; training is provided to collaborating institutions to enhance their expertise, and assist them in using this software to manage their library collections.

Collective regional database WIOLIB

The development of the collective catalogue was the overriding aim at the onset of the project. This activity, which was started in 1993, saw the first CD-ROM out last year (WIOBASE). The WIOBASE CD-ROM developed with the collaboration of the experts from Antwerp has been distributed. This CD-ROM contains data and information on marine sciences relevant to the Western Indian Ocean. Part of the information is in the form of web pages, which are also accessible through the IOC/UNESCO web site (http://www.unesco.org/ioc). Part of the data and information has been extracted from publicly available data archives. Other datasets have been compiled at the Regional Dispatch Centre of the RECOSCIX-WIO Project This CD-ROM contains documentation from several sources: the WIOLIB, ASFA, Antelope and WIODIR databases.
In 1985 when the Kenya-Belgium Project in Marine Science (KBP) was established by the Kenya Marine and Fisheries Research Institute and the Free University of Brussels (Belgium), it was realised that lack of library facilities and up to date scientific information was a serious impediment to the on going research It was on this note the RECOSCIX-WIO Project was established. After it was effectively launched the project undertook to develop a collective resource for the region (WIOLIB)

The development of this database was actively started in 1993. Relevant co-operating libraries were identified and the first training workshop was organised in 1992. In this training, librarians from these libraries were trained in the MIBIS library management software. In this first course they were trained on the use of MIBIS and in the follow up courses on the use of ASFISIS. The MIBIS structure was later changed to the ASISIS database structure.

To establish basic infrastructure for the smooth start of the process, the project provided equipment to the co-operating libraries. These are the libraries which were identified to contribute towards the development of the database. Eight institutions benefited from this venture. It is from these institutions that the librarians were also trained during the workshops. These institutions include, Kenyatta University (Kenya), University of Nairobi (Kenya), Centre National de Recherche Oceanographique (Madagascar), Albion Fisheries Research Institute (Mauritius), Instituto de Investigacao Pesqueira, (Mozambique) Seychelles Deprtment of Environment (Seychelles), Seychelles Fishing Authority (Seychelles) and Institute of Marine Science.(Tanzania). More Institutions were later incorporated as CIs and received equipment. Most of these are research institutions have libraries with a considerable amount of marine literature.

These librarians had to foresee and develop the entries at their libraries and submit their inputs in electronic format to the RDC for merging to create a bigger collective database. The four years of the development of the WIOLIB database included a lot of challenges but with effort from the RDC to keep the process going and support from agencies like IOC and LUC, most of the immediate obstacles were overcome and the development of the database continued.

The response from these institutions regarding input was varied: Most of these libraries did a considerable amount of effort to develop their databases. Both the University of Nairobi and Kenyatta University did make some progress with over 500 entries (each made using ASFISIS) submitted to RDC. But due to other duties assigned to the library staff, they had no staff dedicated to data entry and therefore this slowed down the input of records. The response from the Institute of Marine Science (IMS) was not encouraging at the beginning. After the staff who was trained left the institute, the data entry could not go because the other staff had not mastered the input procedure. This slowed down the input process. Shortly after the departure of the librarian in charge, the computer broke down and data entry was then suspended. The library contains a considerable number of documents that need to appear in the database but training is their major setback. An RDC staff was later sent to the Institute to train the staff and this was done and the input continues albeit at a slow pace due to lack of staff. The staff responsible for data input has to do other administrative duties too.

The Seychelles Fishing Authority did make good progress, first using the MIBIS structure and lately using the ASFISIS. The division of environment had their library database prepared by a UNDP consultant, who entered the entire holdings of the documentation centre using MIBIS. The library staff were not able to master the software. This led to their inability to make updates.

The University of Mauritius is currently computerising its library holdings. They do not use ASFISI since they cover disciplines besides aquatic sciences. Instead they use another end-user application based on the CDS-ISIS. Different databases available in the library will be linked and made available through the University network.

ASFISIS was not installed at the Albion Fisheries Centre because they did not have a qualified librarian. A qualified librarian was hired on contract basis to complete data entry, using CDS-ISIS based program. There is a problem in getting a good qualified librarian at the institute since there is no career structure for them, which makes long-term employment as a librarian unattractive, but hopefully the available personnel will be able to maintain the database once it is completed.

CNRO in Madagascar are still using MIBIS structure since they were not present at the last workshop for librarians. When they submit their records the RDC has to do a conversion to the ASFISIS format. ASFISI, instructions on installation and use, were sent but the documentalist still require training to be able to work with the program.

The ASFISIS software has been installed at the IIP in Mozambique but they prefer not to use it. They are using " DocBase," another customised version of CDS/ISIS for data entry. They received training in Portugal on its use. It is not clear who did the initial entry in DocBase but new acquisitions are no longer entered into the database since apparently nobody is capable of doing this.

The RDC was not spared its share of problems At the beginning frequent power failures hampered the data entry and the project had to budget for a generator to facilitate a continuous working environment. However, much of what is in the database is the input from the RDC.

Analysis of the problems

Despite all these difficulties these institutions managed to put together a sizeable amount of data and send it for inclusion into the collective catalogue of holdings at RDC. Most of the libraries in the region have a good amount of literature but lack the professional librarians to manage it. It can be seen that poor staff morale and deteriorating physical infrastructure are very prominent in most of these institutions. This can be attributed to the fact that governments, traditionally the main funders, have cut back severely on funding of research, partly as a response to structural adjustment. The low level of funding has had significant impact on research institutions leading to deteriorating physical infrastructure, poor staff morale, woefully inadequate research materials and inadequate funds for research Complete lack of professionals in these libraries is a problem that will be there for a longer time to come, unless these governments change their policies towards information in these institutions. Most of these institutions which apparently fall under government ministries have low incentives in terms of salary structure for trained library staff or professional information specialists. In fact, in other institutions they do not have a salary structure for a librarian and the library is therefore left in the hands of a scientist to manage it.

Complete dedication of the available staff to the duties of the library another problem that is very prevalent in some of the institutions. Due to the fact that these libraries are understaffed, the available staff have to attend to other duties.

The RDC does not have a reliable direct connection to some of the institutions through the telephone. Relevant infrastructure has been installed in these institutions to enable fax communication and even email communication but the poor state of telephone lines makes it very difficult to establish these links. Telecommunications is a public (government) property in many countries. Government owned telecommunication operators are usually inefficient. Commercial service providers have not been allowed to provide value-added services until very recently. Some institutions in the region were not able to send their participants for training because information could not be communicated in time.

Some countries in the region use other languages other than English as their official language. In Madagascar and Mozambique, the fact that ASFISIS is fundamentally in English is a problem. Librarians in both countries requested that a translation of the ASFISIS thesaurus be done to enable them do the coding easily. Madagascar and La Reunion are mainly French speakers and in Mozambique they use Portuguese. Language is a barrier in regions like La Reunion (which is a protectorate of France) where they use French and English is a big problem to them. They require in this case French manuals and the thesaurus should be in French. Training has been offered in English, therefore this requires more training in French, specifically for the French-speaking region.

One of the fundamental problems in some institutions is the lack of the culture for sharing information. Most scientists keep in their custody a considerable amount of literature and data with them. In the recent past effort has been made to encourage them make these records available for processing especially for the ASFA database.

Recommendations

Strengthening of regional research networks like RECOSCIX-WIO needs a collective effort from all the participating institutions and governments. It should not be left to the project alone to face all the challenges of developing such a network.

The research institutions should realize the importance of these initiatives. They should consider the time-consuming nature of setting up these networks and the costs involved and render support and also make good use of these networks. They should encourage staff on a permanent basis to support tasks like the database development that will go a long way in assisting the research work in the region.

The institutions of the region should, as a collective venture, assess existing networks and exchange views and ideas on possible modalities for closer co-operation. They should promote informed debates on the relevance of these initiatives and raise awareness, especially on the governmental level.

Governments should play a more active role in supporting the initiatives in establishing these networks and have a view to take them over after the duration of funding has ended. They should work towards establishing firm library structures in these institutions, hire professional staff and boost staff morale to discourage staff mobility.

There is a need for forums for African leaders to promote a dynamic change in the information and help in repositioning policies to facilitate African countries' participation in the information society.

The Project and collaborating agencies should continue to invest in continuous training of staff and consider sending professionals to individual centers to carry out training on site.

There is a need for national policy and sectoral workshops to intensify policy dialogue on obsolete regulatory frameworks. At the national level, workshops should be held for senior policy level demonstrating the development potential of computer networking, to examine policy restraints in regulatory and pricing areas, taxes and monopolies on equipment, staffing, training and discuss current policy constraints.

The funding of the project by the Belgian government is decreasing, however IOC has offered to support a number of activities and this is a very healthy gesture for the project. The World Bank and other donors with issues of African continent's information technology high on their priority lists should be approached to offer support.

Conclusion

Many African nations continue to suffer from badly performing economies, high foreign debt, declining resources and social infrastructures, These have direct implications for the implementation of initiatives to foster establishment of both manpower resources and other enabling factors and can be seen to be the major problems that need long term planning to solve them. Most of the current constraints to African entry into the global information society lie in the area of policy, human infrastructure and culture. There is a need for visionary leadership to seize available opportunities and avoid increasing marginalization. There is a constant need to train personnel to operate and utilise the new systems that are being introduced. Changes are also necessary in attitudes about information and its use- creating cultures that are information hungry and information sharing.

A combination of new policies and direct support by regional and international institutions will make the efforts of regional projects in developing lasting networks a great success. The rational for such support can only be strong if the countries of the region become full actors in the initiatives and also in the global information revolution. An increased flow of information and access to relevant data will greatly enhance the research capabilities of the region. It will also contribute to the also increase in Africa's participation in the global dialogue on environmental issues.

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RUSSIAN LITERATURE AND ACCESS TO ITS ENORMOUS MATERIAL

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Abstract: The paper discussed the fact that the huge amount of Russian literature is unknown to Western scientists. This statement was confirmed by the result of analysis of two comprehensive database (DB): Science Citation Index (SCI) DB in 1993-96 and DB of grant holders of Russian Foundation for Basic Research (RFBR). The best sources to Russian literature are Journal Abstracts and a database in all fields of natural and applied sciences, which is produced and published by All Russian Institute for Scientific and Technical Information (VINITI). VINITI database is more reliable and comprehensive tool, which provides access to any kind of Russian publications: papers, gray literature, patents, books, conference proceedings, pamphlets, etc. It contains more than 15 million records since 1981.

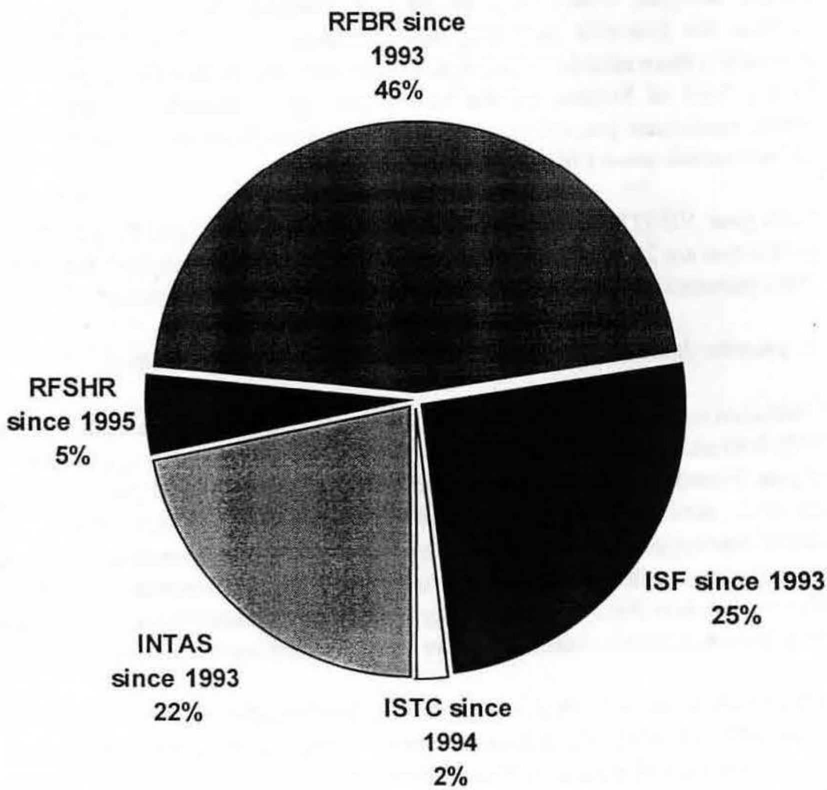
Each year VINITI DB includes about 1 million records and Russian publication are 25% of them. The files of "Geology," "Geography," and "Environmental Science" include about 40% of Russian publications.

Keywords: database, Arctic, Russia, access, literature, scientometrics.

A review published in *Science* in 1993 considered the state of science in the former Soviet Union (FSU). It emphasized that "the state of research has never been more grave than during last year. Scientists are forced now to compete for resources against other arguably more urgent needs, such as economic reform and social welfare, in a fragmented and chaotic political environment". The conclusion of this review is that research in FSU has a future, but the government had to take measure to persuade the best scientists to stay in science. We can state now that despite instability and economic problems Russian science survived and Russian scientists continue to make a great contribution to world science.

A few years ago, there was a major reform involving funding allocations in Russia. The appearance of different independent funding agency supporting basic research is a new stage in the development of science in Russia. First, in 1992 the government of Russia created the Russian Foundation of Basic Research (RFBR). RFBR is the organization that implements the principles, which are standard for the world scientific community but essentially new for our country. It introduces the concept of competition, based on strict review, and transfers the final decision about support for research to the hands of scientists themselves. At the same time the opportunities to submit applications for grants to foreign funding organizations were opened. An unprecedented event in the scientific community of FSU was the allocation, by American businessman G. Soros, of $200 million to support basic research in the FSU. The International Science Foundation (ISF) was created in Moscow to organize distribution of grants funded by G. Soros. During the period 1993-96 research support by ISF was $66.5 million by ISF and $121.1 million by RFBR. The support of Russian science by different funding agencies is shown in the fig.1

Fig. 1. The support of Russian science by different funding agencies 1993-1996



This paper is a part of the project which has as objectives: (1) to characterize scientific research activities of institutions co-funded by ISF and RFBR during the period 1993-96;

(2) to identify and describe the nature of collaborative work involving scientists in Russia and in the West; (3) to analyze the distribution of funding and resulting research productivity among diverse geographic regions of Russia; (4) to characterize differences between science supported by domestic funding and that funded by international grants (5) to assess the impact of grants on the development of collaboration, publication, citations and citation impacts of the funded research (supported by INTAS project N 96-0036).

The RFBR database, which includes information about grant recipients in 1993-97, provides a unique opportunity for a bibliometric study about science in Russia. The information in the database came from grant recipients. The database also includes full information about the funded project, address and name of the organization where research was done, the name of funding agency and the type of the organization (research institute or educational organization).

We have a strong belief that the results of competition for funding give the real picture of what is working in science and which institute and research team should be supported by scarce funds.

The RFBR database contains information about 11,665 research projects and 1,250 organizations. It allows searching by field of science, to trace the best scientific groups and organizations, to evaluate the performance of scientists, their contribution to the world science. The search by organization shows a new type of small enterprise, which appeared in "perestroyka" time and are competitive in research with well-known organizations. The appearance of these small enterprises in the list of organizations reflects the behavior of researchers and the adaptation of the scientific community to the new economic conditions.

During 1993-97 RFBR distributed more than:
- 290 individual grants for the research related to Arctic study;
- 7 grants to produce the database related to Arctic study; (as an example, snow and ice resources of the Asian continent, etc.)
- 16 grants to publish books;
- 26 to support expeditions.

The distributions of grants devoted to Arctic study by field of science follows:
Biology - 36.0 %
Earth Science - 61.5 %
Social Science - 2.5 % (minorities on North of Russia, etc.)

One of the conditions of RFBR policy is that grant holders have to publish the results of the research supported by RFBR. According to the evaluation of editor-in-chief of the journal *Petrology,* Prof. O. Bogatikov about 80% - 90% of the papers published in 1995-96 have reflected the results of research supported by RFBR. About 50 - 60% of papers in the Russian journal *Geochemistry* were related to the research supported by RFBR. To evaluate the impact of grants on information output, the reports submitted by grant holders to RFBR in 1996 were studied. Usually the duration of grant was two years and it there is at least a one-year lag before the paper was published. We found out that in 1996 6,500 grant holders have published more than 54,000 papers. Only half of these publications were covered by Science Citation Index database (SCI).

SCI is used by scientometricians for statistical analysis. To demonstrate the contribution of Russian science to world information flow we traced the performance of Russia as reflected in SCI during the years 1993-96. Russia was in seventh place among 102 countries according to the number of papers - more than 22,000. In 1993, 94 Russian journal titles were covered by SCI. In 1995 the number of Russian journal titles covered dropped to 71 (a decrease of 25%). However, the number of paper did not change: 22,327 in 1993 and 22,310 in 1996. This fact allows us to draw the conclusion that a huge amount of Russian literature is unknown to Western scientists.

All Russian Institute for Scientific and Technical Information (VINITI), the country's central information institute, is a well-known multidisciplinary information service which produces and publishes 26 Journal Abstracts (JA) in all fields of natural and applied sciences. Since 1981 VINITI produced and maintained a database (DB) and set up an on-line service for users in Russia as well in other countries. DB VINITI is only one more reliable and comprehensive tool, which provides access to any kind of Russian publications: papers, gray literature, patents, books, conference proceedings, pamphlets, etc. It contains more than 17 million records since 1981. Each year VINITI DB includes about 1 million records and about 25% of them belong to Russian publications. The files of "Geology," "Geography," and "Environmental Science" include about 40% Russian publications.

Using VINITI DB, specialized information on a variety of subjects can be compiled according to a user's request. Backfiles - available for 1981 through 1997 - allow retrospective searching of Russian publications. Varieties of formats (CD-ROM, diskette, and network) are available. VINITI continues the cooperation with partners working in New Independent States (NIS) and includes in its database the publications from these countries. VINITI's products continue to be the main source of information for scientists working in the New Independent States of the former Soviet Union.

All request for copies of any kind of Russian literature should be sent to:
PIKVINITI@COMDEL.RU

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STACHY IN THE STACKS?
ONE LIBRARY'S EXPERIENCE WITH *STACHYBOTRYS ATRA*.

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ABSTRACT: In 1997, the Halifax Fisheries Library was in the process of moving the entire collection of 10,000 monographs, 100,000 government documents and 100,000+ journal volumes to merge with the collection of the Library at the Bedford Institute of Oceanography, situated across the harbour in Dartmouth, Nova Scotia. Moving and merging collections are complex tasks with extensive planning necessary before any items can be moved. In the middle of this strategic manoeuver, *Stachybotrys atra* (SA) was discovered in some areas of the building where the collection was located. SA is a greenish-black mould producing several toxic chemicals which cause health risks.

This paper presents documentation of what happened to the collection after the discovery of the toxin. No protocol existed for treatment of this mould on library (or paper) materials. Are we testing our collections adequately for moulds? Are we putting our own library staff at risk daily in what may be an unsafe environment?

Located in the Halifax Fisheries Laboratory, the Halifax Fisheries Library has been serving Atlantic Canada's federal Department of Fisheries and Oceans personnel, university students and the public since 1930. As part of departmental cost cutting measures in the mid 1990s, it was decided that the 70 year old building would be sold, staff and research programs would be redistributed, and the library would merge with its "sister" library across the harbour at the Bedford Institute of Oceanography. Located right on the harbour in downtown Halifax, Nova Scotia, a high tide and strong winds could and occasionally did flood the basement. Leaks in the roof throughout the building, including the library, were not uncommon.

Moving and merging collections are complex tasks requiring extensive planning. Preparing for the move began in the Spring of 1996 with an anticipated moving date in the Fall of 1997. We were as prepared as we thought we could be until *Stachybotrys atra* (SA) was discovered in several areas of the building in which the library was located as well as in a few library ceiling tiles. Suddenly, the collection wasn't going anywhere.

Stachybotrys atra (SA) is a greenish-black, gelatinous mass of spores that thrives on materials with high cellulose and low nitrogen content. This toxigenic fungus (mould) is found worldwide on building materials, paper, straw and hay which have become chronically moist or water-damaged due to excessive humidity, water leaks, condensation, or flooding. SA produces several toxic chemicals called trichothecene mycotoxins which are known to be toxic to humans who are exposed to significant quantities. Individuals with chronic exposure to the toxin produced by SA have reported cold and flu symptoms, respiratory problems, sore throats, diarrhea, headaches, dermatitis, intermittent local hair loss and chronic fatigue (University of Minnesota 1997). It has also been linked to bleeding, immune suppression and adverse effects on the central nervous system, (Indoor Air Solutions 1996). According to a Health Canada pamphlet published in 1994, the percentage of people who develop symptoms is low, however, persons with a history of allergic conditions, chronic inflammatory lung diseases or those who are immunocompromised should be removed from affected areas. According to that same pamphlet, safe exposure levels have not yet been established. The toxic and allergenic health response depends on exposure circumstances and dose (Johanning *et al.* 1993). Long-term health risks are not well known (Johanning *et al.* 1996).

The heavily contaminated areas in the building, none of which was located in the library, were immediately isolated. These areas were sealed off with polyethylene to reduce the possibility of spreading fungal contamination to other parts of the building. It was determined that the presence of airborne concentrations of the mould spores in the non-heavily contaminated areas (6 CFU/m3–19 CFU/m3) did not warrant immediate removal of the employees from the building, however, a plan for the relocation of all staff in the building was implemented (Health Canada 1997a, 1997b). The library remained open to internal staff but discontinued contact with the public. No items could leave the library, so loans and ILLs were discontinued. Occupational health nurses met with employees to discuss potential health risks and those with additional health concerns were invited to contact Health Canada personnel to complete an Indoor Air Quality Questionnaire and see a medical officer if necessary.

A protocol for decontaminating all items leaving the building was developed by a local mycologist. Non-porous materials such as glass, plastic, metal surfaces, etc., were cleaned with a 5-10% bleach solution, followed by HEPA (high efficiency particulate air) vacuuming. Initially, we were led to believe that this bleach solution would be used to decontaminate library material. We instantly declared this to be unacceptable. After persistent protestations, we got assurances that the books would not be decontaminated using any chemicals or liquid solutions. The treatment method for books and paper products was based on the guidelines defined in *Mold: Managing a Mold Invasion: Guidelines for Disaster Response* (1994). Because the building was considered "contaminated", *everything* that left the building had to be discarded or treated. None of the lab personnel enjoyed the very arduous task of discarding, sorting and packing up materials for decontamination, but packing one's personal affects, office and lab supplies paled in comparison to the more than 200,000 library items that would have to go through a two step decontamination procedure. The thought of every item being handled twice (by non librarians no less) before reaching its final destination was cause for great concern, not to mention intermittent stress.

A local company – not library staff – was contracted for the job. The first step involved surface cleaning with a HEPA vacuum in the library. HEPA filters are necessary because they will trap most mould spores before they can exit the vacuum cleaner (American Institute for Conservation Book & Paper Group 1994). Wearing protective, disposable suits and respirators with HEPA filters, workers vacuumed all the books and immediately placed them in 3 foot long cardboard boxes, custom designed for the move. (A standard library shelf in North America is 3 feet long.)

The second stage involved taking the 500 boxes to the decontamination chamber where they would undergo another process. The "decon chamber" was a temporary structure, constructed in the loading dock of the building, with polyethylene sheets for walls securely affixed to the ceiling and floor. All items entered the decon chamber at one end, received treatment, got placed in clean cardboard boxes in an ante-chamber, and left the chamber at the opposite end "spore-free". The treatment for the books involved fanning the items in front of a negative pressure unit. This unit filters the flow of air in an enclosed space keeping the air continuously clean. Outside this decon chamber, movers loaded these boxes into a truck and finally, they were on their way to their new location across the harbour.

Initially, we insisted a library staff member supervise all stages of the decontamination process to ensure careful handling of the books and to number the boxes. This was not a particularly enjoyable task as it meant wearing the uncomfortable gear and standing all day, but in the name of order and control, we thought it necessary. After several days, it was decided that a library presence in the decon chamber was not essential. The books were being treated satisfactorily, kept in "reasonable" order and the workers were willing to number the boxes themselves. The entire procedure was still very closely supervised by library staff. Thousands upon thousands of books were decontaminated, yet only a handful were damaged, lost or discarded during this process.

Although we were concerned about the decontamination procedure for our entire collection, we were especially concerned about our rare book collection (approximately 200 volumes). We informed the company overseeing the decontamination procedure that we would not allow one book to be moved unless a separate set of tests revealed evidence of toxic mould. Valued at several hundred thousand dollars, with several volumes in fragile and delicate condition, we didn't want anyone even touching these books, never mind vacuuming them. A conservator had inspected the collection a year earlier and concluded that the books were in good condition with no new active mould. They had been stored in a separate room in the library, whose door was closed 16 hours a day. The rare book collection was sufficiently far from the contaminated ceiling tile, so we doubted the presence of toxic spores. Air samples confirmed that none of the species found was a human pathogen and we were able to move these books without any treatment. We were very relieved.

Spores, either active or dormant are everywhere and good housekeeping and proper filtration notwithstanding, no atmosphere can be completely free of organisms (Northeast Document Conservation Center 1994). It is possible, however, to inhibit mould growth by controlling temperature, humidity, air circulation, and light and regularly inspecting heating/ventilation/air conditioning (HVAC) units. There is no shortage of literature discussing these factors (NDCC 1994; Nyberg 1987; Conservation Center for Art and Historic Artifacts 1994). Periodic inspections of the books for signs of visible mould are also essential. Even though not all moulds are toxic to humans they still can damage, even destroy books. Treatment methods are varied and may include fumigation, fungicial and fungistatic measures, freeze drying, fogging, Lysol® wipe down, bleach solution wipe down, and HEPA vacuuming. Conservators and other professionals with "mould" experience should be consulted to help develop an appropriate remediation plan. Be aware that some treatment methods may be more hazardous to human health than the fungi they are meant to eliminate. A variety of fungicidal materials and chemical treatments involving thymol, ortho-phenyl phenol, ethylene oxide, paradichlorobenzine, and carbon dioxide are hazardous to human health and are not recommended (Nyberg 1987).

When it comes to a toxic mould such as SA, the presence of visible mould, evidence of water damage and symptoms consistent with an allergic or toxic response to SA severe enough to result in lost work days (as judged by medical documentation) are clear indications that a site inspection is necessary. This may require bulk sampling and air monitoring (Special Appendix 1994). The involvement of health officials and professionals trained in the handling of hazardous materials is essential.

Because of the ubiquitous nature of spores, no environment can ever be completely free of spores. Not all moulds are toxic, however, moulds are powerful sensitisers and exposure to them can lead to debilitating allergy even among persons not prone to allergies (NDCC 1994). Because adverse health effects of SA depend on exposure circumstances and levels, repeated exposure should be avoided (Johanning *et al.* 1993). Levels of SA in the library were low (6 CFU/m3) yet we were extremely fortunate that none of the library staff presented symptoms or became ill but mould-related health complaints in libraries and office buildings are a reality. Library personnel at the University of Minnesota in Duluth complained about breathing problems, eye irritations, and skin rashes caused by (unnamed) mould and fungal spores released after books were handled during a barcoding project. Staff were given gloves and masks and encouraged to use them ("Illnesses Linked to Mold" 1993). Shortly after a $1.9 million renovation, the Tottenville Public Library on Staten Island discovered SA and other toxic moulds. The library hired environmental consultants to conduct tests at the request of a doctor who was treating a library employee for persistent bronchial problems. The library was closed and employees were reassigned to other branches (Holloway 1997). Within two months of the Tottenville closure, two other branches of the New York Public Library shut down because of SA (Lii 1997). In May of 1994, a group of staff and former staff filed a $400,000,000 suit against the New Museum of Contemporary Art, charging the museum with responsibility for disabilities caused by the growth of SA in the sub-basement of the museum exhibit space (Motylewski 1994). America's love for litigation notwithstanding, the lawsuit illustrates the extent to which employees want their health concerns taken seriously. According to Monona Rossol of Artists, Crafts and Theater Safety (ACTS), it appears the suit was settled out of court with no public information given about awards or outcome (personal communication September 2, 1998).

As we look to the electronic future, let's not only remember our archival past but work diligently to preserve and conserve it. Let's continue (or begin) to ensure our libraries are safe places to work. Addressing the occupational health and safety needs of library personnel must be a constant concern. Certain fungi may be more detrimental to books than humans and certain toxic fungi may have more serious implications for human health than book health, but they are not mutually exclusive and should never be compromised.

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THE GLOBAL DIRECTORY OF MARINE (AND FRESHWATER) PROFESSIONALS (GLODIR)

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ABSTRACT: The Global Directory of Marine (and Freshwater) Professionals is a database, developed and maintained by the Intergovernmental Oceanographic Commission of UNESCO (IOC), containing information on individuals involved in all aspects of Marine or Freshwater Research and Management. It is intended to be a tool for scientists, policy makers and anyone who needs to contact a marine or freshwater professional. A Professional is defined as anyone who, through his/her job, has expertise related to the research and management of the aquatic environment.

The GLODIR is a product developed under the auspices of the IODE Group of Experts on Marine Information Management (GE-MIM). GLODIR is a free product but can be used only for non-profit purposes.

A YEAR IN THE LIFE OF THE IAMSLIC LISTSERVER

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ABSTRACT: The IAMSLIC Listserver was examined for one year, September 1997 through August 1998. A previous IAMSLIC study had examined this listserver as a vehicle for interlibrary loan requests. These now account for 40-60% of the traffic in a given month, an increase from earlier. A 1997 comparative study of 10 professional library listservers over one month indicated that the percentage of interlibrary loan requests on the IAMSLIC listserver is higher than for many other listservers. However, there are also many other types of questions and information posted to the listserver. This paper discusses the characteristics and possible trends of messages posted to the IAMSLIC Listserver.

INTRODUCTION

Nearly all IAMSLIC members have been using, or at least, reading, the IAMSLIC Listserver, many of us since it was established in 1991. It plays an important role in our work, and it is time to look at it and document what it is being used for, as well as who is using it.

Aside from a natural interest in examining this much-used service, two previous publications inspired this work. At the 1996 IAMSLIC Conference, Barbara Butler presented the results of an 18-month study of the use of the IAMSLIC Listserver for interlibrary loan (ILL). She documented an increase in ILL requests over the period from February 1995 to July 1996 and reported 370 ILL requests out of a total of 1745 messages (Butler 1997). It seemed likely that these figures had changed since then. The other impetus was my participation in a one-month study of 10 science and technology librarian mailing lists in late spring 1997 (Duda *et al.* 1997). One of the lists looked at was the IAMSLIC Listserver. Other listservs examined included ones for librarians specializing in natural history, biology, botany, chemistry, engineering, and geology. We reported, among other things, that the IAMSLIC Listserver was more international, less used for discussion, and more used for ILL than the other lists examined. The differences were attributed to the greater number of librarians using the list who worked at small isolated libraries than was the case for users of the other lists. The methodology and results of this study indicated that a similar study concentrating on the IAMSLIC Listserver for a whole year could be very useful.

METHODS

The IAMSLIC Listserver was examined for one year, September 1997 through August 1998. All messages were archived, with the messages for each month in a separate file. All messages were examined after the month was complete. Each message was examined twice. After a random examination of a number of messages to determine content categories, a list of 40 probable categories of messages was constructed. The final tabulation had 38 categories (Table 1). The number of messages in each category was recorded for each month. Categories at the top of the list included ILL-related messages, duplicate offers, requests for address information, reference questions, and requests for citation information. Other categories included requests to subscribe or unsubscribe (sent by error to the listserver), software and website information, library procedures (especially cataloging), and occasional spam problems.

A second table was constructed for the origin of the messages, including all probable countries, with space for recording separate States of the United States and Provinces of Canada. The initial table included almost all places where messages originated over the year, with only a few additions needed later. As the study progressed, several names were eliminated from the list when no messages appeared from these places. In the second examination of all messages, the origin of each message was recorded on the origin table.

RESULTS

Categories. Over the period September 1997 through August 1998, there were 2122 messages sent to the IAMSLIC Listserver (Table 1). This far exceeds the 1745 messages recorded over 18 months in 1995-1996 (Butler 1997). The maximum number of messages (245) was in July 1998, the minimum (124) was in December 1997. The number of messages varies greatly from month to month, but over the year there appears to be a slight increase.

Interlibrary loan (ILL) requests made up the largest proportion of each month's messages. Over the year there were a total of 626 ILL requests (29.5% of all messages). ILL requests as a percentage of all messages were highest in June 1998 at 37% (N=51). The lowest percentage was 24.9% (N=61) in July 1998. ILL-related messages were classified into three categories: ILL requests, noted above; responses to ILL requests; and thanks for ILL requests filled. Figures for all these three categories together were added to give figures for a category called Total ILL. Total ILL for the year was 952 (44.9% of total messages). Total ILL reached a high of 58.6% (N=112) in February 1998 and a low of 40.4% (N=99) in July 1998. The figures for ILL are much higher than those recorded earlier by Butler (1997), but in contrast to that study, there was no obvious trend upward or downward over this year. ILL messages were not analyzed for type of materials requested. Butler (1997) measured a success rate of 22% for all ILL requests, based on responses to requests, but noted that the rate was probably higher because responses may not have been sent to the whole list. In this study, the ratio of total ILL thanks (182) to ILL requests for the year (626) indicates a success rate of 29%, but this too may not reflect the true success rate, but only an improved response to the plea to inform the whole list when requests have been filled.

The figures indicate that although ILL is the most important part of the IAMSLIC Listserver traffic, it usually represents less than half of all messages. After ILL, the next highest number of messages concerned offers to give or sell duplicates. This is the only category that showed an obvious increase over the year. It ranged from a high of 18 messages in October, February and March, to a low of 11 in May, then there was a jump to 21 messages in June and then 63 in July, ending with 40 in August. The next category was requests for addresses, either e-mail or other. This was highest in November (11 requests) and lowest in August (2 requests) but no trend was evident. The next categories in total volume were general reference questions that might be asked in a science library and requests for citation information/verification. A category was established for software information, and when discussions increased about Ariel, these messages were recorded in this category. In all there were 46 messages in this category.

The Library Procedures category included all discussions of cataloging. It accounted for 36 messages. Two spam attacks and the resulting complaints and discussion about them resulted in 10 messages in October and 11 messages in February, but otherwise there were practically no spam problems.

Despite clear instructions on subscribing to the list, and reminders that subscription requests are not to be sent to the IAMSLIC Listserver, there were messages to subscribe or unsubscribe sent in error every month, as many as 7 in March and July, and 48 for the whole year.

IAMSLIC-related messages were divided into three categories: IAMSLIC business, conference information, and news. IAMSLIC Business accounted for 18 messages over the year, but all four categories together had only 35 messages. This listserver is not used much to discuss the organization, but rather to assist in library business.

Of the 38 categories of messages, 7 had fewer than 10 messages, and 14 had fewer than 20 messages, out of the total of 2122 messages.

Origins Messages were sent to the IAMSLIC Listserver from a total of 42 countries (Table 2). In addition, 21 messages were posted from unknown origins. Messages were sent from 26 states of the United States and from 7 provinces of Canada (Table 3). Of the total 2122 messages, 1153 (54.34%) came from the United States, followed by Australia with 175, Canada 159, Mexico 73, Chile 62, and South Africa 62. Scandinavia was represented only by Denmark with 32 messages and Iceland with 19 messages. A total of 15 countries sent only one message each and 23 sent fewer than 10 messages each. With the exception of Switzerland, all messages originated from countries with seacoasts, which indicates the continuing prominence of marine libraries as opposed to freshwater aquatic libraries.

From the United States, 1153 messages were sent from 26 States (Table 3), with 251 (21.77%) of them originating in California, followed by Florida with 230 (19.95%), North Carolina 80 (6.94%), Oregon 59 (5.12%), and Hawai'i, with 51 (4.42%). Of the 26 States represented, only 5, Illinois (1 message), Minnesota (1), Utah (5), Wisconsin (1) and Wyoming (4) have no seacoast, again indicating a marine bias.

From Canada, 159 messages were sent from 7 Provinces (Table 3), 45 of them from British Columbia (28.3%), followed by Québec, 38 messages (23.9%), Newfoundland 33 (20.75%), Nova Scotia 16 (10.06%), New Brunswick 14 (8.81%) and 2 inland freshwater Provinces, Manitoba, 9 messages and Ontario, 2 messages.

DISCUSSION and CONCLUSIONS

This study indicates that this listserver is indeed a valuable tool, with continued high usage. Usage is much higher than was reported two years earlier. The variation from month to month is considerable, but there appears to be a slight overall increase over this year. It is noted that the second and third lowest numbers of messages were late in the study, in May and June respectively, followed by the highest number of messages in July, so any trends are somewhat obscure.

In common with most other science/technology listservers (Duda, et al., 1997), the IAMSLIC Listserver is not primarily a "discussion" list. There is little debate or discussion of theoretical questions. The listserver is used to assist daily library work. It is primarily used for ILL, requests for information about locations, techniques and procedures, or announcements of publications, conferences and job openings, etc.

The IAMSLIC Listserver is not a moderated list. Anyone can post a message to the listserver and it appears without intervention. Thus the ILL function, which has achieved prominence on this listserver is open to anyone, IAMSLIC member or not. Moderators play various roles, including filtering out unwanted messages, facilitating discussion, or providing expert answers to questions posted to the list (Berge 1992). Control of ILL traffic could be one reason to consider having a moderator for the list. However, the moderator's job involves considerable time and effort and also slows the posting of messages to the list, so a decision to moderate the list should not be taken lightly.

Examination of the origins of messages indicates that this is indeed an international listserver. Traffic is dominated by messages from the United States, but these only account for 54% of the total. The top 7 countries originating messages are on 5 continents. No analysis was made of types of institutions sending messages, but the analysis of countries, states and provinces indicates a strong bias toward marine libraries. It is not known how many EURASLIC librarians use this list in addition to, or instead of, a strictly EURASLIC list, which might have a stronger freshwater aquatic bias, but it is noted that European countries rank lower than many others in the frequency of origins of messages.

The IAMSLIC Listserver is popular and working well and seems likely to continue. Although ILL accounts for much of the traffic, the listserver is also used for many other topics, and it appears that this mix of uses is functioning well. It would be useful and interesting to repeat this study in the future, perhaps in 5 years or sooner.

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Table 1.

IAMSLIC Listserver: Messages by Category

	09 97	10 97	11 97	12 97	01 98	02 98	03 98	04 98	05 98	06 98	07 98	08 98	ALL
ILL Requests	47	51	45	44	47	65	57	61	44	51	61	53	626
ILL Responses	16	14	18	20	19	26	16	25	7	16	14	13	204
ILL Thanks	17	12	13	6	13	21	15	21	15	9	24	16	182
Total ILL	**80**	**77**	**76**	**70**	**79**	**112**	**88**	**107**	**66**	**76**	**99**	**82**	**952**
Duplicate Offers	17	18	12	12	15	18	18	12	11	21	63	40	257
Addresses/Contacts	7	13	16	4	12	7	8	15	6	7	14	2	111
Reference	10	11	4	6	10	8	17	11	2	5	2	13	99
Citation Info	6	10	1	5	8	5	15	15	9	5	14	5	98
Publications/Articles	2	8	2	3		4	19	3	6	8	3	5	63
Subscribe	5	3	1	1	5	2	7	5	3	6	7	3	48
Software/Ariel	5	3	1		7	1	5	14	9	1			46
Serials Info	3	5	3		1	6	2	6	1		7	9	43
Websites/WWW Info	7	4	5	5	8	3	3	1	1		2	4	43
Library Procedures	2		3		11	2	5		6		6	1	36
Spam/Hoax	1	10	1	1		11	4						28
Job Announcements		3	1		6	1	1	4	4	1	3	2	26
IAMSLIC Business	5	3		1	2	1	2	2			1	5	22
Marine Science News			5	1			5			1	6	5	22
Library Policies	1	6	5	1	1	1	2	1		1	1	1	21
Databases	1	1		2	2		4	1		1	3	3	18
Institution Info	1				3	2		1	1		1	6	15
IAMSLIC Listserver	2	2				1			3	2	3	2	15
Conferences	1	3		4		1	1	1			1	1	14
Publisher/Vendor Info	1							4		2	6		13
Colleague News	1	2	2	4	1		1					1	12
IAMSLIC Conference	4	1				2			1		1	2	11
Library General Info		1		1	1	2		1	2		1		9
Humor	3			1	1			1					6
Internet Info					1			4	1				6
General Discussions	1			2*					2				5
Personal Info	1	1						1	1				4
Journal Paper Call		1							1			1	3
IAMSLIC News							1				1		2
Total N =	**167**	**186**	**148**	**124**	**174**	**191**	**204**	**215**	**137**	**138**	**245**	**193**	**2122**

*Holiday Greetings

Table 2.

IAMSLIC Listserver: Messages by Origin

	09 97	10 97	11 97	12 97	01 98	02 98	03 98	04 98	05 98	06 98	07 98	08 98	Sum
United States	96	107	73	63	105	109	109	135	60	64	127	105	**1153**
Australia	17	16	6	12	21	12	21	15	14	10	19	12	**175**
Canada	4	9	9	11	11	24	12	9	13	9	32	16	**159**
Mexico	8	3	2	5	9	5	6	10	5	8	3	9	**73**
Chile	1	2	5	3	2		9	10	7	5	11	7	**62**
South Africa	3	2	9	8	2	2	3	6	10	5	9	2	**61**
Germany		1	5	2	3	6	5	2	3	5	2	6	**40**
Philippines	7	2	7		3		5		2		5	3	**34**
United Kingdom	2	7	3	2	3	5	2	3	1		3	2	**33**
Denmark	1		1	4	1	1	1	1	1	3	11	7	**32**
New Zealand	3	4	1	1	6	2	1	2	2		5	4	**31**
France	1	5	2		2		5	3	5		2	5	**30**
Italy	1	5	8	2		1	6	1	2	3	1		**30**
India	1	2	2	2	1		7	5		4	2	2	**28**
Bermuda	3	4	5	3	2	3				2	2	2	**26**
Fiji		4	2	1	2	2	2	3	5	2	1	2	**26**
Iceland	1	5	1	1	2	4	1	3	1				**19**
Barbados											6	5	**11**
Greece	2		1	3						3		1	**10**
Brazil	1							2	2		2	2	**9**
Cuba					1	3		4					**8**
Malaysia					2			2		1		3	**8**
Switzerland	1	3	2					1				1	**8**
Spain		1	2	1			1			1			**6**
Jamaica						1		4					**5**
Russia					2						3		**5**
Ukraine						1		1		1			**3**
Belgium						1							**1**
China								1					**1**
Ecuador	1												**1**
Guam					1								**1**
Hong Kong										1			**1**
Ireland									1				**1**
Netherlands							1						**1**
New Caledonia	1												**1**
Pakistan							1						**1**
Palau										1			**1**
Peru									1				**1**
Singapore							1						**1**
Taiwan							1						**1**
Thailand									1				**1**
Virgin Islands							1	1			1		**1**
UNKNOWN	1	3	1	1		6	1	3	1	3		1	**21**
ALL ORIGINS	**167**	**186**	**148**	**124**	**174**	**191**	**204**	**215**	**127**	**138**	**245**	**193**	**2122**

Table 3.

IAMSLIC Listserver: Messages by Origin: United States & Canada

	09 97	10 97	11 97	12 97	01 98	02 98	03 98	04 98	05 98	06 98	07 98	08 98	Sum
UNITED STATES	**96**	**107**	**73**	**63**	**105**	**109**	**109**	**135**	**60**	**64**	**127**	**105**	**1153**
California	23	25	17	21	25	29	26	33	13	17	29	20	**251**
Florida	18	20	20	10	27	24	25	16	9	12	27	22	**230**
North Carolina		12	4	5	3	15	7	9	7	3	7	8	**80**
Oregon	3	8	7	6	5	6	6	5	3		7	3	**59**
Hawai'i	5	4	4	3	4	3	8	7	4	4	6	3	**51**
Massachusetts	1	4	2			4	3	6	4	4		5	**37**
Texas	7	4	1	3	3	5	6	3		1	2	2	**37**
Maryland	6	5	6	5	1	1	2	2	14	1	3	7	**33**
Mississippi	4	1	3	3	4		2	3	2	1	3	7	**33**
Rhode Island	1		1	1	1	1	3	3	5	6	2	4	**29**
South Carolina	8	1					4	6	2	1	3	3	**28**
Alaska	2	3	17		3			1			1		**27**
Virginia	8	3	1		3	2	3	2	2		3		**27**
Louisiana	1	3			3		3	4	3	3	6		**26**
Connecticut		1	1		2	4	3	7	1	3	2		**24**
Washington			3	1	2	5	3	2	2	2	2	1	**23**
Alabama				2		5	1				2		**10**
D.C.		1		1			1					4	**7**
Georgia		4						2	1				**7**
New York	1		1			1	2	1	1				**7**
Utah	2	3											**5**
Wyoming	1							3					**4**
New Jersey	3												**3**
Illinois					1								**1**
Minnesota												1	**1**
Wisconsin											1		**1**

	09 97	10 97	11 97	12 97	01 98	02 98	03 98	04 98	05 98	06 98	07 98	08 98	Sum
CANADA	**4**	**9**	**9**	**11**	**11**	**24**	**12**	**9**	**13**	**9**	**32**	**16**	**159**
British Columbia	3	1	3	2	1	2	2	3	3	1	18	6	**45**
Québec		6	3	2	4	7	2		4	1	6	3	**38**
Newfoundland			1	4	2	8	3	2	3	2	4	4	**33**
Nova Scotia		1		1		3	1	2	1	5	2		**16**
New Brunswick	1	1	2	2	1	1	1	1	1		2	1	**14**
Manitoba					3	3	2		1				**9**
Ontario							1					1	**2**

LCSH AND THE ASFIS THESAURUS: AN UPDATE

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ABSTRACT: At the 1987 IAMSLIC Annual Conference, a presentation comparing Library of Congress Subject Headings with the ASFIS Thesaurus (published 1990) excited considerable interest in continuation of the study and preparation of a guide based on the comparison for the use of catalogers. The IAMSLIC Coordinating Committee on Subject Analysis was established with a mandate to act as a clearinghouse for IAMSLIC suggestions for changes to either LCSH or the ASFIS Thesaurus and to produce a document mapping ASFIS Thesaurus terms with LCSH. Various versions of the document have been nearly finished and various possibilities for publication have been explored as LCSH and the ASFIS Thesaurus continue to be updated. This paper gives an update on the history, present status and future of the committee's activities.

BACKGROUND

The Aquatic Sciences and Fisheries Thesaurus (Fagetti *et al.* 1986) was introduced to IAMSLIC at the Annual Conference in October 1986 by Jonathan Sears (Sears 1988). The thesaurus had been developed from the experience of indexing more than 300,000 items from 1971-1986. The purpose of the thesaurus was to serve as an input tool for term selection by ASFA indexers worldwide and to be a search aid for users of the ASFA database, guiding the searcher to desired concepts and suggesting other closely related concepts. ASFA indexes journal articles, reports and monographs.

With the exception of individual journal articles, much of the same material is cataloged by libraries, using Library of Congress subject headings (LCSH), especially in North America. Realizing this, one of us (JWM) undertook a study to compare the ASFIS Thesaurus and LCSH and determine the amount of overlap between them. The results were presented at the IAMSLIC conference in 1987 (Markham 1990). It was demonstrated that the overall match between ASFIS descriptors and LCSH is very low. (Table 1) This study added to the body of literature that shows that when compared with

Table 1. ASFIS Thesaurus descriptors compared against LCSH

DESCRIPTOR FACET	*# terms*	*% total*	+	-	*ST*	*DT*	*NT*	*BT*
Operations	**751**	11.95	23.43	43.54	16.38	4.93	6.79	2.93
Properties & Characteristics	**420**	6.68	17.62	68.10	3.33	0.95	9.76	0.24
Phenomena	**1141**	22.92	24.43	63.43	4.44	3.05	4.51	0.14
Materials	**1186**	18.87	54.13	37.69	5.14	1.69	1.26	0.08
Intellectual Tools	**310**	4.93	17.42	71.29	6.45	1.94	2.90	0.00
Equipment & Structures	**639**	10.17	26.60	58.84	9.55	1.88	3.13	0.00
Sciences & Technology	**230**	3.66	56.09	28.70	7.83	4.78	2.61	0.00
Organisms	**413**	6.57	36.32	51.33	8.47	1.94	1.94	0.00
Earth, Space & Time Concepts	**566**	9.01	18.47	71.20	8.30	1.24	0.71	0.18
Organizational, Socioeconomic, Legal Personnel Aspects	**268**	4.36	31.34	50.00	9.70	0.75	8.21	0.00
Constants	**36**	0.57	13.89	80.56	2.78	0	2.78	0.00
Residual Concepts	**25**	0.39	12.00	80.00	4.00	4.00	0.00	0.00
All Facets	**6285**	**100.00**	**31.54**	**54.65**	**7.49**	**2.42**	**3.85**	**0.43**

Table 1. Key: + = Exact match in LCSH; - = No equivalent in LCSH; ***ST*** = Similar term in LCSH; ***DT*** = Different term is equivalent in LCSH; ***NT*** = Narrower term is equivalent in LCSH; ***BT*** = Broader term is equivalent in LCSH. All figures except # terms are in %. (Table from Markham, 1990)

subject-specific thesauri and encyclopedias, LCSH in all cases was "found to be deficient when measured against other bibliographic standards in the field" (Mischo 1982).

At that same meeting, the Coordinating Committee on Subject Analysis was formed. The charge to the committee was: 1) Act as a clearinghouse for suggestions of changes to LCSH and the ASFIS Thesaurus; 2) Produce a document mapping ASFIS against LCSH; 3) Seek funding to support publication.

From 1987 to 1995 the committee, whose membership has varied through the years, worked at checking and updating the original lists. Three lists were compiled A) ASFIS terms which had exact matches in LCSH; B) ASFIS terms that had equivalents in LCSH, either similar, different, broader or narrower, and C) terms for which there were no equivalents.

The committee obtained a frequency list of ASFIS terms in the ASFA Database. The highest posted terms in List C, i.e., terms with no LCSH equivalents, are prime candidates to propose as new LC Subject Headings. In discussions with the Library of Congress it has been established that suggestions for new subject headings are welcomed if they are accompanied by appropriate documentation. Some submissions have been made successfully, and many more are being prepared.

Originally, the committee planned to publish the lists as an Appendix to the newest edition of the ASFIS Thesaurus, as an aid to catalogers worldwide who are seeking the best LCSH equivalent for ASFIS terms. The idea was rejected by FAO and ASFA officials, because LC is American and ASFA is international. Other publishers who were approached also rejected the proposal, primarily on the basis of economics.

Since the initial proposal to publish a list mapping ASFIS terms against LCSH was made in 1987, several developments have occurred. While negotiations were carried on to find a publisher for the comparison lists, LCSH was updated every year, with some of the unmatched ASFIS terms incorporated as new subject headings. The ASFIS Thesaurus is also being updated. As a result, the original matching lists are no longer usable and will have to be redone before a list is actually published.

Meanwhile, another factor in recent years is the development of the World Wide Web. LCSH is now on the Web and the ASFIS Thesaurus is also on the Web. With the advent of this now tool, and the realization that a printed comparison list would be outdated rapidly as both LCSH and the ASFIS Thesaurus continue to develop, it became clear the Web was ideal for this project. By matching the ASFIS Thesaurus Web Page against the LCSH Web Page, a web page mapping the former against the latter could be built. This page could be available to catalogers worldwide, without the distribution problems inherent in printed lists. It could also be updated frequently and regularly as one or the other of the parent lists changed.

We have been promised tapes of the ASFIS Thesaurus, and work has already begun on building the page. A sample has been produced (Fig. 1) and is growing. As the list is made larger, it will also be improved to allow for more dynamic matching of terms, so that catalogers will have an easy-to-use tool available. Studies are now being carried out to determine how far the process of building the page may be automated. Other studies will determine the probable time involved in doing some of the routine work that cannot be automated, but does not require advanced expertise. When a good estimate is obtained, we will apply for a grant to pay a student to do much of the routine work. When that is underway, we will be able to predict when this cataloging aid will be available for use.

DISCUSSION

Subject headings are at least 100 years old (Boll 1982), while descriptors are less than 40 years old (Sears, 1988). Descriptors are relatively quick to respond to changes in terminology. The tension between the stability of the system and its responsiveness to change is a key issue for LCSH for currency of headings (Chan 1995).

There are several fundamental differences between descriptors used in thesauri and controlled subject headings: 1) subject headings are applied by librarians, descriptors by non-librarians, in ASFA's case by scientists (Emerson and Moulder 1997); 2) in the past a minimal number of subject headings were assigned; 3) as a corollary to that, minor topics did not receive subject headings; 4) subject headings are often inverted; 5) subject headings are pre-coordinated, descriptors are post coordinated; 6) LCSH have subdivisions; 7) Subject headings are applied on the principle of economy of input and redundancy of search, whereas descriptors emphasize redundancy of input and economy of search (Boll 1982).

Subject indexing is an expensive occupation for libraries and publishers. The confusion caused by multiple terms being used by various indexing tools makes it more difficult for our users (and us) to find information on the same topic across multiple databases. The confusion created by the differences between descriptors and subject heading increases for users with multiple access points available in online searching modes that include controlled vocabulary, free text and numerous other fields in each record. The main problem with using LCSH is defined by Foskett: "Librarians and other intermediaries realize that LCSH is an artificial indexing language, and use it as such, but users probably do not, thus placing yet another barrier between them and the information they are seeking (Drabenstott 1994).

The words used by authors often present problems. While we think that authors working in the same scientific area will use the same words, this is not always the case. One may use the scientific name, one the common name. The same term can be used for different things. In a study done by Lourdes Collantes (1995), three user groups gave names to forty stimuli. The names generated were compared with the other groups and with the

LCSH. There was little agreement between groups in the names used to describe either text or illustrations. There was even less agreement between the names the groups used and LCSH.

It is interesting to note that in 1995 the British Library confirmed its long-term commitment to applying LCSH to its catalogues. At the same time they acknowledged that LCSH is a "system which is in need of a lot of development work" (MacEwan 1998). This reinstatement of LCSHs to the records for the British National Bibliography (BNB) came as a response to customer demands. In 1996 BNB dropped the use of its COMPASS system of indexing. Thus LCSH is moving towards being an English-language standard.

As both LCSH and the ASFIS Thesaurus are developed further are used more widely, it becomes more important to provide a single site which allows catalogers and searchers to compare both tools. This project is proceeding toward providing that site.

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ASFIS Thesaurus & Library of Congress Subject Headings

A | B | C | D | E | F| G | H | I | J | K | L | M
| N | O | P | Q | R | S | T | U | V | W | X| Y| Z

ASFIS Thesaurus Term	LCSH Equivalent Term
A	
Top	
Abdomen	**Abdomen**
Abiotic factors	*None*
Abnormalities	**Plants - Abnormalities** **Animals - Abnormalities**
Absolute humidity	**Humidity**
Absolute vorticity	**Vortex-motion**
Absorption (Physics)	**Absorption of sound** **Light absorption**
Absorption coefficient	**Absorption of light**
Adrenal glands	**Adrenal glands**
B	
Top	
Backscatter	**Underwater acoustics**
Backshore	**Beaches**
Backwash	**Ocean waves**

AN INTRODUCTION TO THE ESTABLISHMENT OF AN ARCHIVES AT SMALL INSTITUTIONS

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ABSTRACT: Whether you are given the responsibility for your institution's archival materials or are planning to establish an archives, you'll need a basic understanding and some practical guidelines to get started. This paper addresses the needs of one-person libraries that have to administer and preserve records of enduring value of their parent institution. The initiation of an archival program involves an organization's ongoing commitment and support for the availability of unique groups of historical records. With enough resources and an adequate facility, the archival staff can develop and implement goals, plans, and priorities. Archival functions include collection development, appraisal, arrangement and description, reference and access, outreach, and preservation. Additionally, the archival culture offers support, insight and resources.

Introduction

Many organizations and institutions have an interest in keeping materials that document their activities and history, whether for administrative use or historical interest. Records may be stored in various places throughout an organization, making it difficult to locate, organize or retrieve items. A special event such as an anniversary or exhibit, or writing a history of the institution may also trigger the need to set up an archives. Collecting, preserving and making these records accessible can benefit the organization and researchers alike. Ideally an organization would hire a professionally trained archivist to manage its archival materials, although in many instances the archives starts out as part of the librarian's responsibility. In the absence of a professional archivist, an archival consultant can work closely with an organization to help initiate an archival program.

Basic Concepts

It's helpful to clarify the various interpretations of the term 'archives' and 'archiving' from the beginning and to distinguish between library and archival work. For example, 'archiving' can be associated with the term "electronic archiving", which means different things to different people, including the electronic storage of journals and other published materials, or digitizing them for preservation and access. Libraries typically deal with published, discrete items whereas archives deal with non-published materials such as papers, manuscripts, and visual materials. Additionally when people think of archives they think of preservation; however it also includes reference, which requires processing, cataloging and access.

The term "archives" is a collective noun which has three meanings, all of which must be included in the goals and objectives of an archival program:

- The *materials* generated by individuals and organizations in the course of business transactions that are saved because of their enduring value. These records consist of any medium, including paper, film, photographs, sound recordings, and increasingly, electronic records.
- The *place or site* where archival materials are located.
- The *agency or program* responsible for selecting the materials of enduring value.

Organizations retain and preserve materials for many reasons – administrative, fiscal, legal, intrinsic, evidential, and/or informational – all of which comprise their *archival value*. Archivists often use the term "archives" to include *manuscripts,* which are the papers of individuals, an artificial collection of materials acquired from various sources, or individual documents acquired because of their significance.

Administration

From the outset an archival program should comply with the institution's mission, goals and objectives by providing support services to other offices and fulfilling archival tasks. The public or private nature of the institution, for example, will determine the activities of the archives. The first step in establishing an archives is to secure sufficient authority and flexibility to negotiate for the transfer of records from the organization's offices. Ideally the archives would be independent of other departments and report to a central administration; nonetheless it needs a clearly defined status within the larger organizational framework. It's also invaluable to know the scope of the archivist's responsibilities, and who the supervisor is, as his or her support can be critical for the function of the archives. The administrative status should also enable the archives to work effectively with other organization offices that have related functions, such as a records management department.

A comprehensive archives policy is a written statement which should be approved by the governing board of the parent institution. One component of the policy is a *statement of authority*, which reflects the institution's support and the scope of the program, and can be included in the mission statement. The *mission statement* states the purpose of an archival program and its connection to the organization as a whole, including what activities or groups the archives is documenting, the reason for initiating an archival program, what the archives collects, and whom the archives serves. A sample archives policy for IAMSLIC might look like the following:

International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) Archives

Policy Statement

The purpose of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) Archives is to collect, organize, describe, preserve and make available for research and reference use the archival materials of the Organization and those ancillary records of the Organization's Regional Groups which have enduring historical, legal, fiscal, and/or administrative value to warrant permanent preservation.

The IAMSLIC Archives seeks to promote knowledge and understanding of the origins, aims, programs, and goals of the Organization and of the development of these aims, programs, and goals as reflected in the workings of the official IAMSLIC offices, committees, and Regional Groups. It provides information services that will assist the operation of the Organization in addition to serving research by making available and encouraging use of its collection by members of the Organization and the community at large. Official organization records include any and all documentation in any form produced or received by any member of the International Association of Aquatic and Marine Science Libraries while engaged in the conduct of official IAMSLIC business.

The IAMSLIC Archives seeks to provide adequate and appropriate conditions for storage and preservation of official organization records. In addition, it facilitates efficient records management to further assure that permanently valuable records are preserved and to encourage efficient use of space within the Organization's Archives housed at the Woods Hole Oceanographic Institution. In collecting these materials, the Organization's Archives undertakes to recognize and honor matters of privilege and confidentiality.

Other administrative work includes the development of goals, plans, and priorities in the form of a planning document. The document should take into consideration the archives' mission and the organization's purpose and goals, and address areas such as policy review, staffing and supervising, and education. Other activities include position descriptions that help to define duties and reflect the varied responsibilities; and maintaining a budget. A useful addition is an archival advisory board comprising members from the organization and community who can bring archival expertise and political institutional knowledge to the program, and raise awareness about the archives in the organization. Board members can also inform the archivist about important projects and activities whose materials could be targeted for the archives.

Collection Development & Appraisal

An archivist initiates the archival activity by collecting records and papers for the institution archives. A written *collections development* or *acquisition policy* provides the procedures and activities needed for acquiring, identifying and transferring such materials. Offices in an organization or institution accumulate records that over time complete their life cycle; at this stage an archivist can assist with the transfer of materials to the archives, using the policy to help determine which materials have long-term value. Records lose much of their administrative value when transferred to the archives, and often get used later for reasons different from those for which they were created. The policy should also target areas of weakness in the current archival holdings documenting the organization's history, either by office or chronologically. The archivist should evaluate the organization's official records, the papers of affiliated groups or people, and any other materials relating to the organization, such as audio and visual recordings, oral histories, artifacts, and manuscript collections. The written plan also articulates what materials the archives does not accept, and defines acceptable donor restrictions. Statements regarding copyright and literary rights should if possible be assigned to the institution or appropriate governing board.

Part of the process of drafting a collection policy is conducting a records survey within the archives and throughout the whole organization. A survey enables the archivist to learn the various functions and responsibilities of all parts of the institution. It will also help to identify records of long term value and to anticipate future space and resource needs. A survey should begin with materials already stored or accumulated for the archives then proceed with all the institution's offices. A standardized survey form should include such basic information as:

- office of origin/creator
- date range
- quantity in cubic or linear feet
- location
- if possible- notes on the organization and content, and preservation

Enlisting the help of administrative staff in some capacity during the survey will draw attention to the "archival value" of their records, and improve communication and support for future collaboration. Although "taking stock" can be time consuming, the archivist will have a clearer picture of how records are created and maintained, and the archivist's role in the organization will also gain visibility and recognition. The survey results should be reviewed for the amount and quality or value of the records. Archivists look at the value of information and evidence contained in the records to determine if they are archival.

Appraisal is the process of determining which records fall within the scope of the collection development or acquisition policy. The process also involves the *disposition* of records, whereby inactive records are either transferred to the archives or destroyed. Records which merit priority in the selection process include those that document the institution's development and growth, and the activities of offices, departments, or committees responsible for policy making and approval. In most organizations less than five percent of records generated are permanent and of historical value. The archivist should also consult the institution's legal department for the legal retention period of documents as well as any other kinds of restrictions. Confidential or sensitive materials are often invaluable to researchers, for example, and can be restricted as long as necessary rather than being discarded. Appraisal has no specific time schedule and can occur before, during and after the transfer of records to the archives.

Accessioning is the process of formally accepting custody of materials by keeping a record of acquisitions immediately upon their arrival in the archives. An accessions log documents the date of receipt, a unique identifying or accession number, the source of materials, and other identifying information such as quantity, date range, location, a description, access conditions, and notes. In addition, donors giving materials from outside the organization should sign a "Deed of Gift" form, which is a legal document transferring custody of the materials to the archives.

Arrangement and Description

The next phase beyond the initial administrative stages of establishing an archives is the process of *arrangement*, which is the physical organization of materials according to the principles of provenance and original order. The principle of *provenance* states that materials created, accumulated or maintained by a person or organization should not be integrated or interfiled with records from another source, whatever the similarity in subject or format. *Original order* is the rule that records should retain the order and organization established by the "office of origin" or creator. This rule is more difficult rule to maintain when materials arrive in the archives without any recognizable organization, or with an order that has been substantially upset.

Groups of archival materials can be organized into five different levels, as set forth by Oliver Wendell Holmes. The hierarchical order from large to small includes repository; record groups or collection; series and subseries; file units; and items such as a folder or a reel of film. These levels are all defined by different criteria. An archival collection should be arranged and described, or "processed", according to the amount of use it will receive. The size of the collection, and resource and staff constraints may also determine the depth of processing. In the initial process of arrangement it is important to consider the relationship of a collection to other materials in the archives, and to discern the various arrangements within the collection itself.

The process of archival *description* enables the archivist to establish intellectual control over the materials by means of finding aids, guides, databases, and indexed. A finding aid consists of two parts. The narrative section contains biographical or historical information and notes on the content and scope of the materials; the second part consists of a box or folder list of the materials.

Reference and Access

Like libraries, archives provide *reference* service to internal and external users. Unlike libraries, however, an archivist always brings the requested material to the patron and oversees use of the materials. In most organizational archives internal users make requests for materials more than outside patrons. Internal users such as administrators rely on the archivist's knowledge of the collections to retrieve requested material quickly. Outside patrons should receive a form stating the archives' rules and regulations. The archivist should also interview all new users to understand specifically what is requested, and if necessary guide them in the use of archival materials. Issues such as photocopying, reproduction of materials, and copyright should also be addressed.

Access relates to the rules regarding availability and restrictions of archival materials. A written access policy, similar to the archives and the acquisition policy, is an official statement generated by the archives and should be a part of every archival program. The policy states the conditions of access to the archival materials. The Law requires restrictions to some materials, while others remain closed for a limited time. In the United States, archives should abide by the American Library Association's (ALA) and the Society of American Archivists' (SAA) joint statement on access and guidelines for access to original research materials.

Outreach

Outreach activities encompass all aspects of archival work and help to increase awareness of users to the archives' holdings. Although this particular function develops slowly, any form of outreach helps build support for the program. Some initial, yet critical activities include meeting with administrative and department staff, submitting an article in the community or institution's newsletter, mounting a small exhibit of photographs or artifacts, and writing a brochure.

Preservation

Preservation involves the stabilization and protection of materials through appropriate storage, handling and maintenance; it may also mean transferring material to different medium, such as microfilm. Activities range from housing materials in appropriate acid free sleeves or containers, to maintaining optimum temperature and humidity levels for various types of materials.

Conservation involves physically or chemically treating materials; anything requiring more than minor repairs is usually handled by trained conservators.

Conclusion

There are numerous resources to help and support the process of initiating an archival program. Most activities require many steps that may take years to fulfill; however these can be broken down into workable parts and gradually implemented. Archival literature, workshops, regional and national organizations, and the archives listserv are invaluable sources of information. Additionally, visiting other archival repositories can provide insight into how other organizations manage their archival materials. To alleviate staff shortages, students and interns can assist with basic yet time-consuming tasks including rehousing materials and typing lists. Grant money, no matter how small, can help purchase supplies, hire part-time help, or fund an exhibit. Over time, an institution's investment and efforts in preserving and making accessible its records will reap many benefits and rewards.

HELPFUL LITERATURE & RESOURCES

The seven titles in the Archival Fundamentals Series available from the Society of American Archivists (SAA) provide a foundation for modern archival theory and practice.

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Web Sites

The Society of American Archivists
http://www.archivists.org/

American Institute of Physics
http://www.aip.org/history/

Association of Records Managers and Administrators, Inc.
http://www.arma.org/hq/

Institute Archives at the Massachusetts Institute of Technology
http://libraries.mit.edu/archives/

Scripps Institute of Oceanography Archives
http://www/scilib.ucsd.edu/sio/archives

Smithsonian Institution Archives
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RICHARD E. BYRD AND THE NORTH POLE FLIGHT OF 1926: FACT, FICTION AS FACT, AND INTERPRETATION

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ABSTRACT: On May 9, 1926, Richard E. Byrd announced that he and co-pilot Floyd Bennett were the first to fly an airplane over the North Pole. That claim made Byrd an international hero, established him as a pivotal figure in polar exploration and in aerial navigation, and set the stage for Byrd's flight over the South Pole in 1929 and his leadership and participation in five expeditions to Antarctica before his death in 1957.

Byrd's claim to the North Pole in 1926 has aroused controversy. Some critics scoffed that his plane did not have the speed to have reached the Pole in the time he reported. One book even charged that Byrd had merely circled in the horizon out of sight of reporters and then announced his achievement. Three days after Byrd's claim, Roald Amundsen, Lincoln Ellsworth, Umberto Nobile and an international crew aboard the airship *Norge* flew over the Pole in a trans-Arctic crossing.

In 1996, the announcement and discovery of Byrd's diary of the flight in 1926 renewed the debate about Byrd's claim to the North Pole. This presentation reviews the controversy, the diary, which was recently published (*To the Pole: The Diary and Notebook of Richard E. Byrd 1925-1927* (Columbus, Ohio: the Ohio State University Press, 1998), interpretations of the diary, and the records of Byrd's first expedition in the Papers of Admiral Richard E. Byrd at The Ohio State University.

The North Pole, one of the coldest places on earth, has been the site of some of the most hotly debated events in history. Beginning in 1909 Dr. Frederick Cook became the first to claim to have reached the North Pole; a few weeks later Commander Robert Peary asserted his own claim and commenced to vilify Cook. That dispute has continued to spawn numerous books and articles about the rival claims. The latest one advertised that it had resolved the controversy (in 978 pages) and concluded that neither Peary nor Cook reached the Pole (Bryce 1997). Another historical controversy happened on May 9, 1926 when Lieutenant Richard E. Byrd proclaimed that he and co-pilot Floyd Bennett were the first to fly an airplane, the *Josephine Ford,* over the North Pole. That claim, in turn, has been disputed and defended by many. Recently, a televised docudrama about Byrd speculated that self doubts about his accomplishment of the North Pole may have haunted the explorer for the remainder of his life (Cafe Productions 1997).

Actually, there is no evidence that Byrd himself was troubled by his claim to the North Pole. This docudrama, a work of fiction based on fact, accepted as fact an interpretation of a diary discovered in the papers of Admiral Richard Byrd at The Ohio State University. The purposes of this presentation are to provide a brief overview of Byrd and the controversy, to discuss contradicting interpretations of the diary, and to identify other important documents in Byrd's papers about the North Pole flight. Although Byrd died in 1957, his papers were not fully available for scholarship until late in 1994. Until 1997, no one had carefully examined the more than 5,000 items pertaining to Byrd's flight to the North Pole in 1926.

When Richard Byrd flew to the North Pole in 1926, he was already a man of some but limited distinction. His parents traced their lineage to 1671 when Colonel William Byrd established the family in Virginia and developed Westover Plantation along the James River, near Jamestown. Byrd's father achieved distinction as an attorney in private practice and pursued a modest career in politics. He served as a prosecuting attorney for twenty years and as speaker of the house in the Virginia State Assembly. Richard Evelyn Byrd, the polar explorer and pioneer aviator, was born in 1888, the second of three boys. One of his brothers would become governor of the State of Virginia and a United States Senator and the other a successful business man. Richard Byrd himself had an interest in travel to foreign places and decided to seek a career as an officer in the United States Navy. Byrd gained admission to the United States Naval Academy, graduated in 1912 and began a career in the Navy.

Byrd's active duty in the Navy proved very brief. After four years of service, an accident at sea damaged permanently a foot that had already been weakened by two injuries from athletic contests. Unable to stand lengthy watches at sea, Byrd felt himself passed over in promotions and retired from active duty in 1916. A few months later, Byrd returned to duty as a retired officer and took charge of the Naval Militia of the State of Rhode Island, as the United States readied itself for World War I. So effective an organizer was Byrd, that he was called to Washington. Byrd served as the secretary to the chairman of the U.S. Navy Commission on Training, who was Raymond B. Fosdick, a prominent attorney and an associate of John D. Rockefeller. Fosdick would eventually become Byrd's own attorney and his connection to wealthy donors needed for his expeditions. Soon, Byrd tired of administrative duty and took an interest in naval aviation. Here was an arena of accomplishment that did not require long hours of standing. With Fosdick's support and influence Byrd won appointment as a naval aviation cadet in 1917 and stayed as an instructor and as superintendent of the U.S. Naval Base at Pensacola, Florida. In addition to investigating accidents, Byrd also taught aerial navigation and had a special interest in the challenges posed by navigating out of sight of land or natural landmarks. (Byrd Papers, 4128, 4129) In fact, Byrd developed a bubble sextant and a wind-drift indicator for navigational purposes. His interest and accomplishments enabled Byrd to win a place on the Transatlantic Flight Section of the Navy's Bureau of Aeronautics and to be part of the team that achieved the first transatlantic crossing of seaplanes from Long Island, New York to Lisbon, Portugal in 1919 (Byrd Papers, 4126).

From 1919 through 1925, Byrd busied himself with naval aviation and with politics. In 1919 he led the effort to create a Department of Aeronautics in the U.S. Navy and assisted the Navy in opposing an effort to create an air force separate from the U.S. Army and U.S. Navy. In 1922 Byrd had responsibility for creating air stations for the training and organization of pilots in the naval reserves. Two years later Byrd was in the forefront of the campaign to dissuade a frugal U.S. Congress from reducing military salaries (Byrd Papers, 4132). As a reward for these efforts, Byrd received the command of three seaplanes assigned to Donald MacMillan during his privately funded expedition to Greenland in 1925. Although the weather in Greenland limited opportunities for flying in the Arctic, he remained confident in the use of fixed wing aircraft in polar exploration and published two articles on the subject. Byrd also applied unsuccessfully to be a member of the aerial expedition of Roald Amundsen and Lincoln Ellsworth who attempted to fly to the North Pole in 1925 but was invited to be second-in-command of the Wilkins Arctic expedition for 1926. Thus, through interest in airplanes, ambition, talent, and connections to the wealthy and to the politically powerful Byrd had succeeded in establishing himself as a player in the drama of polar exploration.

Byrd declined the invitation from Wilkins, who claimed to have little interest in flying over the North Pole (Wilkins 1928). Instead, Byrd organized his own effort to fly an airplane over the North Pole. He persuaded American millionaires John D. Rockefeller and Edsel Ford, who gave $25,000 each and other people of wealth to donate to his expedition. Volunteers, especially from the naval reserves, joined him at no charge. Shrewdly, Byrd negotiated with the news media for payments in exchange for stories. One document found in Byrd's papers was a contract with Current News Features This guaranteed Byrd at least $18,000, even if Byrd failed to reach the North Pole (Byrd Papers, 4251). Another with the Pond agency promised Byrd a lecture tour after the expedition. From this money Byrd leased a ship and purchased an airplane.

The selection of an airplane was the most critical aspect of Byrd's expedition. In January of 1926, three months before his departure, Byrd was still uncertain and considered using a dirigible. However, a three engine Fokker did become available for purchase. Still in an experimental stage, the tri-motor Fokker had demonstrated its superior dependability by winning a contest for reliability in a sixteen hundred mile schedule of inter-city flight, a contest sponsored by Ford but won by Fokker. Three engine aircraft appeared to be more reliable than one or two engine aircraft because they alone could continue to fly after the loss of an engine (Bowers 1974). In fact, Ford was developing its own three engine

airplanes but a fire delayed production. A second single-engine plane, the *Oriole* would serve to provide some photographic support and could be used for rescue.
So convinced was Byrd that the three engine airplane was reliable that Byrd's final statement to the press before leaving New York City, as documented in Byrd's papers, promised that "Conquering the Arctic with multi-motored planes will give an impetus to commercial aviation....Confidence is all that is needed to lift the curtain on an era of rapid development in air commerce." (Byrd Papers, 4298).

On April 5, 1926 the expedition left New York for Spitzbergen in Norway, a site closer to the North Pole than Greenland and a harbor warm enough to unload airplanes and supplies in the spring. It was also the place where Norwegian explorer Roald Amundsen was awaiting the delivery of an airship, the *Norge,* that would take him, Commander Lincoln Ellsworth, and Umberto Nobile and an international crew across the North Pole.

Shortly after midnight on May 9, 1926, Byrd's airplane left the icy runway at Spitzbergen and returned fifteen and a half hours later to claim the polar prize. Three days later the Norge flew over the North Pole. Byrd's accomplishment made him an international hero. A committee of the National Geographic Society reviewed his records, as they had done for Robert Peary, and rewarded his accomplishment with the Hubbard Medal. Congress presented him the Congressional Medal of Honor. A promotion in rank followed. So, too, did numerous opportunities for lectures. In fact, Byrd was so prominent that he quickly raised money for another effort, a transatlantic flight, and became the third after Charles Lindberg to fly across the Atlantic in 1927. This accomplishment, along with the North Pole claim, set the stage for Byrd to raise money for an expedition to Antarctica. In 1929 Byrd became the first to fly an airplane--a three engine Ford— across the South Pole. From then until his death in 1957 Byrd led or participated in another four expeditions to Antarctica. These succeeded in establishing a permanent , scientific presence of the United States in Antarctica.

Byrd's claim to the North Pole set the stage for his undisputed accomplishments in Antarctica but that claim to the North Pole has drawn critics. Even in 1926 some reporters speculated that Byrd's airplane had been in flight too briefly to have reached the North Pole (Hoyt, p. 125). After Byrd's death in 1957, more skepticism developed. In 1958 appeared the book *Come North with Me*, by Bernt Balchen who had been at Spitzbergen with Amundsen, had helped Byrd, and had been Byrd's pilot during the South pole flight. Balchen questioned Byrd's ability as a navigator and expressed doubts about the speed of the North Pole plane (Balchen, p. 66). In 1960 Gosta H. Liljquist, a professor of meterology at the University of Uppsala, examined meteorological records and concluded that there was no wind strong enough to enable the Josephine Ford to make the polar flight so quickly (Liljequist, pp. 589-591). Finally, in 1971 appeared the book, *Oceans, Poles, and Airmen* by Richard Montague. Montague had interviewed Balchen and published a story that Floyd Bennett, Byrd's pilot, who had died of pneumonia in 1928, had confessed a year earlier to Balchen that the plane had developed an oil leak early in the flight and had circled out of sight of land without making an effort to reach the Pole (Montague, pp. 47-48).

Byrd also had his defenders. The National Geographic Society continued to maintain the claim. Peter Demas, a member of Byrd's expedition, maintained that the flight had been long enough to reach the Pole. And Joe Portney, an expert in navigation, published an article in the *Journal of the Institute of Navigation* that questioned Liljequist's evidence of winds, reviewed Byrd's navigational instruments, and concluded that Byrd was likely to have come within at least fifty nautical miles of the North Pole.

Byrd's diary for the North Pole expedition is a significant element in the controversy. In appearance, the work itself is unimpressive, even shabby. The cover bears the title "1925." Actually, Byrd purchased the volume in 1925 and recorded his thoughts and observations during the expedition with Donald MacMillan in 1925. Then, Byrd used blank pages to record the North Pole expedition of 1926 and even the transatlantic expedition of 1927--without bothering to change the years. To the unprepared, the diary seems confusing at best.

In the diary Byrd recorded his activities and his observations of people and events during the expedition to the North Pole. Byrd also used this diary as a message pad to communicate with his pilot Floyd Bennett. The noise from the three engines made verbal communication difficult. These messages are critically important. One warns pilot Bennett that there is a strong wind and that he must steer carefully. Another scolds Bennett that " You are steering too far to the right. Set compass few degrees to left." and then warns "you must not persist in keeping too far to the right" (Goerler 1998, p.81). Elsewhere Byrd announces that the starboard motor has an oil leak and asks "Can you get all the way back on two motors?" And then notes " 20 miles to go to pole" (Goerler1998, p. 96). At another point, Byrd tells Bennett " We should be at the Pole now. Make a circle. I will take a picture....Radio that we have reached the pole and are now returning with one motor with bad oil leak but expect to be able to make Spitzbergen" (Goerler1998, p.86).

From these messages, two facts have been established that had been questioned previously. First, both Byrd and Bennett did experience a strong wind at times on the flight. Second, it is clear that the Josephine Ford made a legitimate effort to reach the pole. The account published in *Oceans, Poles and Airmen* of a faked flight into the horizon is completely wrong.

In addition, the messages also raise questions about Floyd Bennett's confession to Bernt Balchen that the Josephine Ford had not reached the pole. The diary records Byrd telling Bennett that they are at various distances from the pole, from 240 to 20 miles to go to the Pole and then "We should be at the pole now...." When does Bennett conclude that they did not reach the Pole? Certainly Bennett must have thought so at the time of the flight. There is no apparent evidence that Byrd did not think they were at the Pole. If Bennett believed that they did not reach the Pole, how did he reach this position and did he communicate or confess this to Bernt Balchen later? The answer is that the account in Montague's book, *Oceans, Poles, and Airmen* is a gross distortion. Balchen's own account in the National Archives, is that Balchen questioned Bennett about the speed of the airplane and noted that its speed in the national tour that followed the Polar flight seemed less than what Byrd and Bennett had reported on May 9. According to this account, Bennett simply replied that he could not understand the figures and that he would ask Byrd about this sometime (Balchen, "The Strange Enigma of Admiral Byrd," p. 8).

The newly discovered diary has also been a resource for one of Byrd's critics. Near the bottom of the same page as Byrd's message to pilot Floyd Bennett about the oil leak is a question that is largely erased but still legible, "How long were we gone before we turned around?" The penciled response was "8 1/2" (Goerler 1998). Above it is a calculation that concluded that 20 miles remained to the Pole. During the flight, Byrd also used the diary as a scratch pad upon which he did calculations for some sextant observations to establish to establish his position. Two of the calculations are erased, although they are still legible. These erasures prompted the archives to photograph the entire diary by means of ultra-violet light to detect other erasures that were not eye legible. None appeared.

The first to study the diary and the calculations and messages it contains was Dennis Rawlins, the editor of the journal *DIO* and an historical astronomer who has studied the evidence submitted by explorers to support their claims. In 1973, Mr. Rawlins wrote *Peary at the Pole: Fact or Fiction*, which concluded that Peary could not have reached the North Pole. In that book, Rawlins expressed his doubts about Byrd as a navigator and his claim to the North Pole. (Of the South Pole flight, Mr. Rawlins charged that Byrd's chief navigational instrument was a bottle of cognac.) Rawlins charged that in recognizing Byrd's accomplishment of the North Pole that the National Geographic Society had been overly hasty to award Byrd its medal. In addition, Rawlins noted that Byrd had failed to drop the hundreds of U.S. flags from the Josephine Ford to the North Pole, where they could have been seen by Roald Amundsen and the passengers of the *Norge* a few days later. Finally, Rawlins reiterated the concerns of others that the Josephine Ford was not capable of the flight in the time that Byrd claimed (Rawlins1972, pp. 257-274).

For Rawlins, the diary provided new evidence of fraud that confirmed his previous skepticism of Byrd. Rawlins studied the sextant calculations, including the erasures, in the diary and compared them against Byrd's official report of the flight. Much of Rawlins's focus is on Byrd's calculation of position at 7:07 GCT (Rawlins 1996, pp. 8-10). According to Rawlins, the erasure is the true position of the Josephine Ford and the one more likely to be achieved by the plane at that time. That point would have been a full 136 nautical miles south of where he needed to be to reach the North Pole two hours later. Rawlins argues that Byrd changed the sextant observations to put himself closer to the North Pole than he actually was. In the end, according to Rawlins, Byrd succeeded in reaching no closer than 135 nautical miles from the Pole, a spot from which they may have been able to see the North Pole on a very clear day (Rawlins 1996, pp. 10-12).

From the point of view of Dennis Rawlins, the messages from Byrd to pilot Floyd Bennett seemed less certain than they should have been. The statement from Byrd that they "should" be at the pole seemed less than authoritative than if Byrd had written "We are at the Pole." Similarly, Rawlins points out that Byrd's question about getting back to Spitzbergen with only two engines does not say "Can we get back from the Pole." In the same vein, the question from Byrd "How long were we gone before we turned around?" did not refer to actually having attained the Pole (Rawlins 1996, pp. 4,7). Other historians, however, could-- and will-- argue that Mr. Rawlins had interpreted too severely and critically the wording of messages that were hastily written during a dangerous and unprecedented flight..

Parts of Rawlins's evaluation of the diary did praise Byrd while the conclusion did not. Rawlins noted that Byrd demonstrated remarkable bravery in going so far over the ice and exhibited much more knowledge and ability to navigate than Rawlins had previously credited him. In the end, however, Rawlins concluded that Byrd deliberately turned back knowing that he had not reached the Pole. The compelling reason, according to Rawlins, was the oil leak in the one engine, which Rawlins believes happened much further from the Pole than Byrd admitted. To continue would have been foolish. Thus, Byrd saved the himself, Floyd Bennett, and the *Josephine Ford* from harm. To save himself from financial bankruptcy, the likely cost of turning back early, Byrd claimed the accomplishment anyway (Rawlins 1996, p.2). In the process Byrd also denied this "first" to Roald Amundsen who followed three days later.

Dennis Rawlins was the first to examine the navigational calculations but was not the last. A few months after Rawlins's evaluation, Colonel William Molett reviewed Byrd's diary. An experienced polar navigator who also taught navigation for the U.S. Air Force, Mollett has been a critic of Rawlins and a defender of Robert Peary's claim to the North Pole (Molett 1996, pp.i-iv.). Molett concluded that the differences between the diary and Byrd's final report were inconsequential. Of the erased sextant calculation for 07:07, Molett concluded that the erased position does not fit any previous calculation but the one not erased did (Molett 1998, p.62). According to Molett, Byrd erased the calculation because he knew it was an error.

Molett also had a different interpretation than Rawlins about Byrd's failure to drop the flags. The *Josephine Ford* had difficulty in taking off from Spitzbergen because of the weight of the plane and the fragile nature of the skis that served as landing gear. The flags may have not been on the flight in order to reduce unnecessary weight. Moreover, there was no certainty that all of the flags could be precisely dropped at the pole or that the crew of the Norge would see them, given the uncertainty of lift-off for the *Norge* and the perils of wind and drift. (Molett 1998, pp.62-63) (Byrd's papers do show that Byrd used the flags later to reward prominent supporters. In all likelihood, Byrd would not want to admit that the flags had not been excess baggage and had remained on the ground.)

A third expert has also questioned the value of the sextant calculations in the diary. Dr. Gerry Newsom, a professor in the Department of Astronomy at The Ohio State University, had no previous opinion about Byrd's flight, and agreed to review the data. Newsom concluded that the erased sextant calculations were inconclusive. They said more about the exhausted state of the navigator, who had been without sleep and exposed to much noise and tension than the latitude achieved by the Josephine Ford (Newsom 1997, pp.8-9). At a minimum, according to Newsom, Byrd appears to have gone much further North than Rawlins gave credit (Newsom 1997, p. 10).

Interpretations of experts in navigation and astronomy aside, several questions about the diary remain unanswered. First, why were the erasures so incompletely accomplished if the intent had been to deceive? They can be read by the naked eye. Second, why did Byrd refer to this diary in two of his publications if the diary contained evidence of fraud? Following Byrd's flight across the Atlantic Ocean in 1927, he wrote an article in the *National Geographic Magazine* and referred to the diary: "I made notes in my log and remarks in my diary, the same diary carried over the North Pole with me" (Byrd, *National Geographic* 1927, p. 352). Again in 1928, in *Skyward,* Byrd also referred to the diary using the same words. These are hardly the actions of someone who believes he has something to hide. In fact, they evidence the fact that Byrd believed he had reached the North Pole, as was credited to him by the National Geographical Society.

Certain it is that an oil leak from an airplane in flight is nearly as worrisome now as it was in 1926. Byrd acknowledged that he and Bennett did worry, but that they were close to the Pole when it happened. To conclude that they panicked and turned back short of the Pole is to ignore evidence in Byrd's papers about the reliability of the three engine aircraft and its ability to fly with only two engines. In 1926 Edsel Ford himself praised Byrd for the choice of engines. The letter in Byrd's Papers states, " Your selection of Wright air-cooled motors is a good one, and I believe this motor is by far the best worked out one of its type at the present time. The multi-motored plane is a great boon to safe transportation, and I believe eliminates 90% of the hazard, although I doubt that you will be able to find a plane that will stay aloft with one motor running only, under any consideration" (Byrd Papers, 4269). Another factor to inspire confidence was that Byrd's plane had won the Ford Reliability Tour the previous year. The totality of this evidence makes it unlikely that Byrd would panic about an oil leak in one of the three engines when all continued to function. In fact, the leaking motor never did stop, because the leak had been caused by a faulty rivet. When the oil level fell to below the loose rivet, the leak stopped completely (Byrd 1928).

The speed of Byrd's airplane in traveling the more than 1400 miles is still a question. Factors of altitude and weight as well as wind impact speed. As Byrd acknowledged in *Skyward*, some reporters at Spitzbergen did question that Byrd could accomplish the flight in fifteen and a half hours. However, one of the reporters there was William Bird of the New York Times. In Byrd's papers is a cable from Bird to the Times reporting that the Josephine Ford had just left Spitzbergen and would return in sixteen hours to twenty-four hours (Byrd Papers, 2536). Clearly, Byrd's return was close to the earliest time expected.

In a debate contested so hotly and for so many years, one hesitates to suggest any conclusion. Likely it is that arguments for and against Byrd's accomplishment of the North Pole will continue, even as they have for Peary and for Cook. Byrd's diary is a particularly insightful but not necessarily conclusive document. It records his observations about other explorers, his concerns for the success of the expedition and the well-being of its members. If Byrd knowingly committed a fraud, then a particularly ironic and even comic passage in his diary is Byrd's complaint that the Norwegians were not playing fairly when they refused to make way for Byrd to unload his ship at Spitzbergen! (Goerler 1998). Byrd's accomplishment of the North Pole is likely to remain an enigma. The full record of Byrd's documentation submitted to the U.S. Navy and to the National Geographic Society appears to have been lost many years ago. The diary alone seems too inconclusive to overturn the decision of three experts who reviewed Byrd's claim in 1926. What cannot be denied, however, is that regardless of the controversy surrounding the North Pole, Byrd's real legacy was in Antarctica where Byrd's work resulted in a permanent and scientific presence there.

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WEDNESDAY, JANUARY 14, 1925

We should be at the Pole now. make a circle & will take a picture. then I want the sun

Radio that we have reached the Pole and are now returning with one motor ~~fo~~ with bad oil leak. But expect to be able to make Spitzbergen.

watch	7-07-30	Gna =	17-10-
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Correct	7-07-10	E =	30
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			17 16
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THE GREAT POLAR CONTROVERSY: DR. COOK, MT. MCKINLEY, AND THE QUEST FOR THE POLES

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ABSTRACT: In September 1906, Dr. Frederick A. Cook announced to a receptive public that he and Ed Barrill had successfully climbed Mt. McKinley by a "new route from the North." It was a time of keen interest in exploration, particularly of the Arctic and Antarctic regions. While Cook's was initially hailed as the first ascent of North America's highest mountain, his report came under increasing scrutiny as details came to light (or failed to come to light, as the case may be.) The controversy surrounding Cook's Mt. McKinley climb assumed increasing importance in the context of his claim to have been the first to reach the North Pole in April, 1908. The Doctor's claim was disputed by Robert E. Peary, who announced that he himself was first to the Pole in April, 1909, and that Cook "should not be taken too seriously." The chain of events that followed affected the course of exploration at both poles.

This paper will examine the bases for Cook's claim to have been first on McKinley and first at the North Pole; the sequence of events that has led to general scepticism about Cook's claims; and the figures in Arctic and Antarctic exploration who were caught up in a dispute that continues to the current day. The paper will also report on recent computer-enhanced analyses of Dr. Cook's 1906 alleged Mt. McKinley summit photographs which he published to support his claim of a successful ascent.

KEYWORDS: Cook, Frederick A.; Peary, Robert E.; Mt. McKinley; North Pole; Alaska; Polar regions-- discovery and exploration

Introduction

"I reached the Pole. I climbed Mount McKinley," wrote Dr. Frederick A. Cook in his unpublished autobiography. "The controversy from my angle is at an end" (Abramson 1991, 226). But the controversy was not at an end for Dr. Cook. "More than three-quarters of a century has passed," wrote Beau Riffenburgh (1994, 1), "since the first week of September in 1909 when two men thrilled both the international scientific community and the public of the Western world by virtually simultaneously claiming to have attained what was considered the earth's most alluring geographical goal, the North Pole. For months the furor surrounding Dr. Frederick A. Cook, Robert E. Peary, and which, if either, first reached the Pole received unprecedented coverage in the world press. The issue remains a topic of debate even today."

The history of exploration on Mt. McKinley, highest peak in North America, plays a key role in this Polar dispute, and this paper will briefly look at the ". . .People and events which occurred in Mt. McKinley's early days, and their relation to the great Polar Controversy which so occupied men's minds in the early decades of this century " (Moore [1967] 1981, xiii-xiv). The paper also presents new photographic analysis that bears on Cook's McKinley claim.

In those days the public avidly followed accounts of exploration to the far-off and unknown regions of the planet (Moore (1967] 1981, xiii). This keen interest was followed, or perhaps led, by the newspapers of the day. ". . .The claims of Cook and Peary, and their rivalry, were turned into the media event of the year, particularly by two of the most important newspapers in the United States, *The New York Herald* and *The New York Times*. In fact, the North Pole controversy was as much a competition between these newspapers as it was a feud between the rival explorers" (Riffenburgh 1994, 1).

Personnae

Robert E. Peary was a civil engineer with the US Navy, who was later to use the title Admiral. Peary was an experienced explorer with a dark side. "He was perhaps the most self-serving, paranoid, arrogant, and mean-spirited of all nineteenth-century explorers. He was suspicious of and hateful to those he considered rivals either in actual geographical discovery or as heroic figures. He was condescending and insensitive to his subordinates, and he was ingratiating and servile to those he felt could help his quest for personal glory" (Riffenburgh 1994, 165).

The rival in this case was his earlier comrade Dr. Frederick A. Cook, who had joined Peary on his 1891 North Greenland Expedition as physician. ". . .The first volunteer to go on," Peary wrote of Cook. Cook "was always helpful and an indefatigable worker. . . ." Peary also thought well of the Doctor's "unruffled patience and coolness in an emergency" (Peary 1898:I 423-4, quoted in Riffenbergh 1994, 170).

Cook agreed to join Peary again in Greenland in 1893 but resigned when Peary would not allow him to publish medical and ethnographic studies Cook had written based on the earlier Peary trip (Riffenburgh 1994, 170). Cook returned to Greenland with several expeditions of his own, and began to acquire a reputation as a competent, energetic, resourceful explorer. In 1894, he sailed 90 miles in a small open boat to get help after his expedition ship was stuck in Arctic waters (Moore [1967] 1981, 42). In 1897 Cook joined, as ship's doctor, the Belgian Antarctic (Belgica) Expedition on which Roald Amundsen was beginning his polar career. Amundsen credited Cook with the survival of the unprepared party (the first Antarctic over-wintering). Amundsen wrote that the expedition's escape from the ice was "due first and foremost to the skill, energy, and persistence of Dr. Cook" (*New York American* Sept. 19, 1909, quoted in Riffenburgh 1994, 170).

The Drama Unfolds

These are the central players in this Polar drama of Fall 1909, which gripped the world when on Sept. 1 Cook cabled from the Shetland Islands that he had reached the North Pole on April 21 of the prior year, 1908. He had thus taken some 15 months to return from his trek and report his claim. On Sept. 1, 1909, *The Evening Mail* headlined: "DR COOK REACHES NORTH POLE." The next day, Sept. 2, *The New York Herald* headlined "THE NORTH POLE IS DISCOVERED BY DR. FREDERICK A. COOK, WHO CABLES TO THE HERALD AN EXCLUSIVE ACCOUNT OF HOW HE SET THE AMERICAN FLAG ON THE WORLD'S TOP." ***[FIGURE 1]*** The world was instantly abuzz with excitement, and Cook was hailed a hero. His long absence, disguised initially as a hunting expedition, brought back the crown jewel of exploration. (*The Evening Mail* 1909, Cook 1911). Cook's 1906 Mt. McKinley expedition had created a publicity tidal wave, from which he was able to raise substantial funds to outfit his entire North Pole expedition two years later. The Doctor was congratulated by such eminent explorers as Adolphus Greely, Robert Falcon Scott, Ernest Shackleton, and Roald Amundsen (Riffenburgh 1994, 175).

There was one person, however, who while surprised, he was certainly not delighted for his old comrade's success. That was Admiral Robert E. Peary, who by coincidence was at that very moment en route home after having claimed the North Pole for himself. Peary was thus returning to what he expected would be the adoration and adulation he craved. One can imagine his feelings at having almost 25 years of hard, sometimes desperate work, and the conquest he thought his by divine right, instead claimed by a man he now considered a thief.

Five days after Cook's cable, on Sept. 6, Peary cabled from Labrador that he himself had "Nailed the American flag to the Pole" on Apr. 6, 1909, a year after Cook claimed to have stood at 90 degrees north, and had found no trace of Cook's presence there. Peary cabled that Cook's claim should "not be taken seriously." This was the first public appearance of a dispute between the two. (Hall 1917, 318). On Sept. 7, 1909, newspapers headlined Peary's conquest of the Pole: "ROBERT E. PEARY, AFTER 23 YEAR SIEGE, REACHES NORTH POLE. . . ." (*New York Herald* Sept. 7, 1909). But to Peary's bitter disappointment, his claim to have been first was not generally accepted.

Peary's public condemnation of Cook's claim began immediately. Peary went so far as to obtain "confessions" from Cook's Eskimo companions which were immediately shared with the press: "PEARY QUOTES ESKIMOS AS SAYING COOK WAS NOT OUT OF SIGHT OF LAND," read the Wednesday, Sept. 8 issue of *The Evening Telegram.*

However, momentum had already gathered in Cook's favor. The Doctor arrived in New York from Europe to a huge reception on Sept. 21, 1909. Peary arrived just a few days later, to a litter of soggy confetti. The reception was over.

While it was true in those innocent times that an explorer's word was his honor, both Peary and Cook now felt pressure to produce evidence of their claims. The newspaper war was in full gallop, spurring on the increasingly rancorous dispute with *The New York Times* having a special stake in Peary's claim, while *The New York Herald* had a similar interest in Cook.

The McKinley Factor

At this point in the media clamor there arose the recollection of an event three years previously, which was to sway public and scientific opinion on the Polar controversy inexorably toward Peary. This event involved a massive mountain lying in the far-off Alaska Range: Mt. McKinley, 20,320 feet (6,193.5 m). Mt. McKinley and the North Pole now became forever linked in the history of exploration, and in the lives of these two men, one of whom is now acclaimed as the discoverer of the North Pole, while the other's sad decline was marked by scorn and censure.

Alaska and the McKinley region had become a focus of much public interest and exploration after the purchase from Russia in 1867, and especially so at the end of the 19th Century and beginning of the 20th. In the January 1903 issue *of National Geographic Magazine,* Alfred H. Brooks and D. L. Reaburn of the U.S. Geological Survey published their "Plan for Climbing Mt. McKinley" (Brooks and Reaburn 1903, 30-35).

This same issue, by curious coincidence, published an account of Robert E. Peary's lecture before the National Geographic Society on Nov. 29, 1902 in which, doggedly pursuing his Polar ambitions, he "stated very emphatically that he believed the North Pole could be reached by making Cape Hekla, in northern Grinnell Land, the starting point for a sledging trip north. . ." (Peary on the North Pole 1903, 29). This might be the literary debut of the mingling of the destinies of the great mountain and the North Pole.

Partly in response to the Brooks-Reaburn article, some eleven Mt. McKinley expeditions were mounted over the next decade (Moore [1967] 1981, 29). Brooks suggested "an expedition to climb the mountain should approach it from the northwest" (Brooks and Reaburn 1903, 31). However, of 11 expeditions to the mountain over the next decade, "those from the South exhausted themselves. . .three of four expeditions which wintered North of the range were able progressively to locate the ultimately successful route, in 1910 to make the ascent of the North Peak, and in 1913 to reach the top of the South Peak, the mountain's true summit" (Moore [1967] 1981, 29).

Cook's 1903 McKinley Expedition

Frederick Cook appears on the Mt. McKinley scene in the summer of 1903 as a well-thought of, resourceful, cheerful, and patient expeditioneer. Cook secured funding from Harper's Magazine for an attempt on Mt. McKinley and mounted a full-fledged expedition which included 15 pack horses secured from the Indians in Washington's North Yakima country, and shipped with the expedition all the way to Tyonek, Alaska, the jumping-off point for Mt. McKinley (Cook 1909, 2).

Cook's 1903 expedition primary goal of reaching the summit of the mountain from the North was ultimately defeated. "Though thwarted by an insurmountable wall, we had ascended Mt. McKinley far enough to get a good view of its entire western face" (Cook 1909, 72). But the Cook party accomplished the first land circumnavigation of the mountain, covering a vast amount of country and mapping the terrain. By all accounts it was an excellent job. The expedition's reports, from both Cook and party member Robert Dunn (Dunn 1907) and their maps, were well-received. Cook's reputation was recognized by his election as president of the Explorers Club upon his return to New York City.

The 1906 Expedition

Riding the crest of his reputation, Cook organized a follow-up expedition for 1906 to focus on climbing the mountain from the South, having concluded in 1903 that a northern route was not feasible. He had no problem getting applicants. The party included several men who would play a part in the drama that would unfold after this trip: Prof. Herschel Parker, physicist, of Columbia University, Belmore Browne, artist, author, and climber, and Ed Barrille (Barrill), assistant horsepacker.

The party spent an intense summer in 1906 bushwhacking, routefinding, mapmaking, and crossing rivers, swamps, and tundra to approach the southerly reaches of the mountain. However, the going was slow and difficult and Cook concluded in mid-August that they were still too far from the summit, and the season was too far advanced for a summit bid that year. "Owing to our repeated failures and the advancing winter we decided that our energies for the short period of the remaining season would be better spent in exploration than in climbing, and to this end our plans were now made" (Cook 1909, 181). Cook did conclude that a northeast route to the summit, via Muldrow Glacier, was now the only plausible route. Cook split the party up and assigned various alternate duties, such as "collecting specimens of animal life and [surveying] new districts" (Cook 1909, 181).

Belmore Browne also reported that the summit attempt was given up for the year, and the party disbanded at the Cook Inlet site of Tyonek in mid-August (Moore [1967] 1981, 5).

Doubts Arise

Shortly thereafter, Browne was amazed to hear rumors that Cook had summited the mountain with Ed Barrill. Browne had difficulty believing that Cook and Barrill could have returned to the mountain, traversed to the northern side, and summited, all in the space of 12 days, and with winter weather approaching. "We knew the character of the country that guarded the southern face of the great mountain, we had traveled in that country, and we knew the time that Dr. Cook had been absent was too short to allow of his even reaching the mountain. We therefore denied the rumor" (Moore [1967] 1981, 53).

When Browne and other members of the party met Cook as scheduled in Seldovia, near the southern tip of Alaska's Kenai Peninsula in early September, Cook confirmed that he and Barrill had reached the summit.

"At last the Doctor joined us, and to my surprise confirmed the report. . . As soon as we were alone I turned to him [Barrill] and asked him what he knew about Mount McKinley, and after a moment's hesitation he answered, 'I can tell you all about the big peaks just south of the mountain, but if you want to know about McKinley go and ask Cook.' I had felt all along that Barille would tell me the truth" (Browne 1913:70-71, quoted in Riffenburgh 1994, 184-185). However, on Sept. 27, 1906, Cook wired his backers in New York, "We have reached the summit of Mount McKinley by a new route from the North" (Moore [1967] 1981, 53-54).

Proof, however, was not forthcoming , either from Cook or from Browne on either side of the question. Browne understood that "before I could make the public believe the truth I should have to collect some facts. I wrote immediately upon my return to Professor Parker telling him my opinions and knowledge concerning the climb, and I received a reply form him saying that he believed me implicitly and that the climb, under the existing conditions, was impossible" (Browne 1913:70-71, quoted in Riffenburgh 1994, 185).

Claims and Counter-Claims

Browne and many individuals within the mountaineering and exploration community immediately dismissed Cook's McKinley claim. "I knew that Dr. Cook had not climbed Mount McKinley," Browne proclaimed (1956, 70-71), "the same way a New Yorker would know that no man could walk from the Brooklyn Bridge to Grant's tomb in ten minutes."

According to Dr. Cook, he and Barrill "crept impatiently over the heaven-scraped granite toward the top" of Mt. McKinley and reached the summit on Sept. 16, 1906. Poised at the top of the continent, Cook wrote that he "shall always remember, with a mental focus sharpened by time, the warm friendship of my companion Edward Barrille," in particular, " the final pictures which I took of Barrille with the flag lashed to his ice axe as an arctic air froze the impression into a relief which no words can tell" (Cook 1907, 83; Cook 1908, 231; Washburn 1958, 6). ***[FIGURE 2]*** Indeed, Dr. Cook's now-famous "summit photograph" appeared in the May 1907 edition of Harper's Monthly Magazine as the single most important piece of evidence to support his claim. Dr. Cook need not have worried about his inability to paint a written description of the summit scene, for it was not his words which led to the eventual demise of his claim, but the photographic evidence, the "frozen impression" of Barrill standing atop that snow-covered peak, that would become his Achilles heel.

Browne, his skepticism now confirmed, later wrote, "Barrill had told me so." Cook, responding to questions posed to him by Browne, declared the climb to be "easier than he expected" (Browne 1956, 70-71; 1911, 482).

Publicly, the Harper's article was well received. But Browne, and co-expedition leader Professor Herschel Parker, privately believed that Cook had deceived the world. Although the pair shared their views with fellow members of the American Geographical Society and the Explorers Club, without firm evidence beyond Barrill's subtle, yet powerful statement to Browne in Seldovia, they dared not publicly condemn the Doctor (Browne 1956). Cook's summit account now began to unravel with the 1908 publication of his book *To the Top of the Continent* in which was printed a similar, yet strikingly different summit photograph than that which appeared in the May 1907 Harper's. Opposite page 227 and entitled "The Top of the Continent," the "summit" photograph of Ed Barrill revealed clearly a second peak in the image's lower right-hand corner. Browne and Parker were convinced that this photograph was an uncropped version of the 1907 Harper's photo, and that Cook himself had therefore provided evidence to disprove his own claim. ***[FIGURE 3]***

Browne (1911, 483) argued that "anyone conversant with mountain photography or topography would recognize at first glance," that the second peak "was a mountain as high or higher than the mountain shown as the summit of McKinley." Parker and Browne believed that this photograph "constituted absolute disproof of Dr. Cook's story." Their argument was strengthened by a second photograph, opposite page 239, of a small, obscure peak "in relation to the surrounding mountains," which, Browne declared, proved that "both pictures of the peak were taken from nearly the same point." Dr. Cook had provided Browne and Parker clear photographic evidence of the "fake peak," along with a clear description of the surrounding area in which Cook's photograph's had been taken. The duo's determination to disprove the Doctor's claim grew following Cook's 1909 declaration that he had reached the North Pole the prior year.

The North Pole controversy soon grew to a feverish pitch, with claims and counter-claims becoming daily reading for the world and a source of increased revenues for the newspapers.

Meanwhile, at the South Pole

As Peary's attacks mounted, Cook's long-time friend Roald Amundsen publicly supported the Doctor (Amundsen 1928, 20, 26). However, Amundsen supported Peary's claim as well: " I know Admiral Peary reached the North Pole. The reason I know it is that I knew Peary," he would later write (Amundsen 1928, 225). Nonetheless, Amundsen, a distinguished Polar explorer, in final preparations for his own North Polar expedition, now found dashed any hope of realizing his life-long dream to be first at the North Pole. It is interesting to note that it was Peary's claim and not that of Cook, which Amundsen cites as the reason for his abrupt change of plans. "Then, just as everything was about ready, the world was electrified by the news that Admiral Peary, in April, 1909, had reached the North Pole" (Amundsen 1928, 64). With the North Pole now conquered, Amundsen quietly and deviously revamped his plans and set sail for the Antarctic and the South Pole. "He [Amundsen] understood that it was the claim that counted," wrote polar historian Roland Huntford. "Once made, it destroyed all chance of uncontested primacy and by leaving the issue for ever wreathed in doubt, killed the goal." Amundsen, Huntford argues, had the "Napoleanic audacity to swing from one Pole to the other" (Huntford 1986, 207).

Amundsen's audacity placed him in direct competition for the South Pole with British Antarctic explorer Robert Falcon Scott, who had long before declared his Antarctic intentions. The now famous "race to the Pole" between the two explorers is meticulously documented, for instance, in Huntford's *The Last Place on Earth*. However, it is uncontested that Amundsen and his party were first to reach the Pole, on Dec. 15, 1911. "The regions around the North Pole - well, yes, the North Pole itself - had attracted me from childhood, and here I was at the South Pole," Amundsen declared. "Can anything more topsy-turvy be imagined?" (Amundsen 1925, 121). Travelling light, with dog-teams and skis, the Norwegians attained the Pole in relatively good condition. In "topsy-turvy" contrast, Scott's men, half dead and man-hauling their equipment and supplies, arrived at the Pole on Jan. 18, 1912, and confronted the bitter reality that the Norwegians had beaten them to the prize (Scott 1983, 395-397). Scott and his men suffered not only from the harsh realization of their defeat in the race, but from the devastating cold and near depletion of all food stocks. The men made a valiant attempt to return to their base camp, but succumbed miserably to starvation, frostbite, and hypothermia less than 15 miles from their life-saving depot of food and fuel. On Mar. 29, 1912, Robert Falcon Scott died with his arm draped over one of his companions. Their tent became an ice-encrusted tomb. "Had we lived," Scott wrote, "I should have had a tale to tell of the hardihood, endurance, and courage of my companions which would have stirred the heart of every Englishman" (Scott 1983, 432, 444).

Cook's Claims Unravel

Armed with what they believed to be irrefutable evidence against Dr. Cook, Browne and Parker addressed the Explorers Club, convincing the leadership to conduct a formal investigation into the McKinley matter. Upon Dr. Cook's return to the United States from the North Pole expedition, and with the ever-increasing public war raging between the Doctor and Peary, Cook was called before Explorers Club to answer his critics. On Oct. 15, 1909 and then again on the 17th, the Special Committee of the Explorers Club was held in New York City, at which Chairman Marshall H. Saville informed Dr. Cook that the "committee wants to hear from you concerning the ascent of Mt. McKinley. The data as furnished in your book has been criticized by various persons, as we want those doubtful things cleared up, and you only can explain them" (Explorers Club 1909a). Indeed, Parker and Browne presented a formidable defense of their position, taking detailed issue with Cook's narrative and photographic evidence. They not only questioned Cook's summit photograph, they declared that many of the photographs presented in the 1908 text had purposefully been mis-captioned, misleading the reader as to their true location (Explorers Club 1909a, 15-17).

Throughout the tense afternoon of Oct. 17, committee members encouraged Cook to address these allegations. "If Dr. Cook could say two or three words that would give us any comfort," pleaded one member, "we would be very glad to hear them." Cook declined to address the committee, noting the public firestorm raging about the McKinley and North Pole claims had taken their toll on him. "I have come back here and have suddenly been thrust into a controversy," he pointed out. He explained that he did not have time to "breathe, have not had time to eat, and it doesn't seem to me that you should expect me to go into any details just at this moment." He requested, and was granted one month to collect his thoughts and review his 1908 published account, confessing that he had not "read the book since I have returned, and I had not read any of the copies before I went away [to the North Pole]" (Explorers Club 1909b, 11). Indeed, the book was published while Dr. Cook was on his unannounced 1908 North Pole expedition, as he vanished from the public eye after doubt had surfaced about his McKinley claim.

Dr. Cook failed to meet the Explorers Club deadline, and by December 1909, he had once again disappeared from public sight. Rumors as to his whereabouts ran rampant with newspapers offering rewards of up to $1,000 for information as to his location. Faced with the reality that Cook would not or could not provide any additional information to support his claim, the Committee issued a fourteen-point report to the membership, detailing the case against Dr. Cook. The report dealt a fatal blow not only to Dr. Cook's McKinley claim, but provided the gateway for renewed questions regarding his attainment of the Pole. The final Explorers Club report was dramatic in its simplicity and finality: "Therefore, your committee recommends that the entire claim made by Dr. Cook that he ascended to the summit of Mt. McKinley in 1906 be rejected by the Explorers Club as unworthy of credence" (Explorers Club 1909b, 2). Based on these findings the committee unanimously voted in favor of a motion made by one member that "the name of Dr. Cook be dropped from the rolls of the Explorers Club" (Explorers Club1909c).

At about the same time the Doctor was receiving the key to the City of New York in recognition of his North Pole claim, Ed Barrill released an affidavit given on Oct. 4, 1909, just prior to the Explorers Club meetings, in which Barrill dismissed any notion that he and Cook had reached McKinley's summit. Although there is question as to whether or not Barrill was paid by Peary supporters for such information, the affidavit dealt a critical blow to Cook's credibility. Indeed, just one day prior to the Explorers Club meeting of Oct. 15, *The Globe and Commercial Advertiser* of New York published a full text of Barrill's story. "I was with Dr. Cook continuously every day during the time he was attempting to ascend the mountain," he stated, "and at no time did we reach an elevation in excess of 10,000 ft." In addition to a detailed narrative of the expedition, Barrill provided a sketch map of the exact route he and Cook followed up the Ruth Glacier (Washburn 1989, 121). Armed with such resources, Browne and Parker persuaded the Explorers Club to support an expedition in the summer of 1910 to retrace Dr. Cook's route, duplicate his "summit photo," and attempt to scale the true summit (Browne 1911, 486). Browne was well aware that a successful duplication of Cook's photograph would shatter Cook's public credibility, confessing that such a photograph would settle "once and for all time his Polar claim" (Browne 1956, 74).

In the summer of 1910 three expeditions headed to the slopes of Mt. McKinley. In addition to Browne and Parker, the Oregon-based climbing group, the Mazamas, embarked on an attempt to retrace Cook's expedition in the hopes of vindicating his claim. Stymied by the terrain and convinced that Cook could not have climbed the mountain as he had described, the group conceded that Cook's claim was a hoax (Rusk 1945). Four Alaskan Sourdoughs, who had earlier dismissed Cook's summit story, ventured to the mountain, where two of the members reached the mountain's lower North Peak (Cole 1985). By mid-June, armed with first-hand knowledge of the terrain, Barrill's map and narrative, as well as the Doctor's photographic and written account of the 1906 expedition, Browne and Parker surveyed McKinley's Chulitna Glacier region, which they had explored four years earlier (Browne 1911, 486).

Following Cook's photographs and description, the duo retraced his exact steps up the Ruth Glacier (which Cook had named for his daughter) ending their search along the slopes of a minor snow-covered peak. Travelling ahead of Browne, Parker realized that the "fake peak," Cook's "summit photo," lay just before him. "We've got it!" exclaimed Parker, and, according to Browne, the men "stood there lost in thought of the dramatic side of our discovery." ***[FIGURE 4]*** Parker reached the top and reenacted Barrill's summit pose while Browne photographed the scene. The men estimated this peak to be twenty miles distance from the true summit. They also duplicated a number of Dr. Cook's photographs, proving many of his images were mis-captioned. The pair had indeed discovered Cook's secret, and they soon would share that secret with the rest of the world (Browne 1911, 488). "Our mountain detective work," Browne later explained, "was based on the fact that no man can lie topographically" (Browne 1956, 121).

"EXPLODES DR. COOK'S MT. M'KINLEY CLAIM," declared *The New York Times* on Nov. 11, 1910. "THE GREAT NORTH POLE CLAIMANT NEVER GOT NEARER THAN TWENTY MILES FROM THE PEAK." Here then was final photographic proof vindicating Browne and Parker and forever branding Cook a liar. With his claim of Mt. McKinley destroyed, so went Cook's hopes of maintaining the public's support for his North Pole exploits. Cook was blasted in the press, with all credible claim to the Pole erased. The Peary Arctic Club wasted no time in capitalizing on Cook's misfortune, and gleefully crowned Peary the rightful discoverer of the North Pole.

North Pole or South, No Real Winners but the Truth

Parker, Browne, and climbing companion Merle La Voy, returned in 1912 to try and climb the peak one last time. Battling a fierce blizzard just a few hundred feet below McKinley's summit, the men encountered ferocious winds and cold and abandoned their efforts. "I couldn't go ahead," Browne later wrote, "through the stinging snow I saw a sight that will haunt me to my dying day. The slope above me was no longer steep" (Browne 1956, 344). Just one year later, Walter Harper, part Native Alaskan and part Caucasian, became the first man to step foot on the top of North America, closely followed by expedition organizer Reverend Hudson Stuck, Harry Karstens, and Robert Tatum (Stuck 1989).

By 1913 the Stuck party was heralded as the first to climb McKinley without controversy or question. However, Amundsen's South Pole expedition was tainted by the tragedy of Scott and his men. Financial backers who felt deceived and embarrassingly uninformed also plagued Amundsen's victory and he had to publicly answer those critics who saw his achievement as a cause of Scott's death. The British considered Amundsen's expedition a blatant encroachment upon Scott's continent; not a sporting move to the English, who were fiercely proud of their explorers. Yet Amundsen (1928, 65-66) argued that he had indeed notified Scott of his change in plans and his intent to head south, sending Scott a cable in Australia. "Captain Scott had the fullest possible notice," he declared. Amundsen attributed his victory and Scott's tragic end to the fact that Scott had chosen to man-haul supplies, and use Shetland ponies to transport food and equipment. The ponies quickly bogged down in the snow, proving useless early in the expedition. Amundsen utilized dogs and sledges to establish a series of caches from which the team could advance or retreat. His small, fast and flexible expedition was in stark contrast to Scott's large-scale British military style expedition with large depots and complicated logistics (Amundsen 1928, 68-69).

In the wake of the quest for the North and South Poles we find a trail of personal tragedy, inflated ego, nationalism, public passion and contempt, and enough interest and emotion to fuel debate for generations to come.

Looming in the midst of the Polar controversy stands Mt. McKinley, as dominant a figure in the theatre of exploration as it is on the Alaskan horizon. Although Dr. Cook had distinguished himself on the Belgica Expedition, with Peary in Greenland, and along the lower slopes of Mt. McKinley in 1903 and then again in 1906, his claim to have ascended the mountain marked the beginning of his end. Cook capitalized on his short-lived fame following the McKinley "ascent" to pursue his ultimate goal – the North Pole. Perhaps his claim to the Pole would never have been challenged so vigorously had Browne and Parker not discovered the McKinley ruse. And although Peary's claim caused Amundsen to redirect his efforts south, the fact that two men now claimed the North Pole surely reinforced Amundsen's distaste for following suit. Amundsen's personal relationship with Cook added to the drama as well. Indeed, in 1926 Amundsen, on an American tour, visited Cook while the latter was imprisoned in a Federal penitentiary, convicted in Texas on charges of mail fraud which Cook's supporters felt was unjustified and political. "I felt I could do no less than to make the short journey to the prison and call upon my former benefactor in his present misfortune." Amundsen reflected (1928, 74) that "Whatever Cook may have done he was not the Dr. Cook I knew as a young man," declaring that some "physical misfortune must have overtaken him to change his personality, for which he was not responsible." The Doctor died in 1940, carrying with him answers to so many questions.

The Controversy Continues

In the decades following Cook's death, several serious attempts were made to retrace his McKinley expedition and recreate his "summit photographs." Indeed, Cook had left behind a set of photographic "fingerprints" from which to work. Dr. Cook's supporters have repeatedly claimed to uncover new evidence placing the Doctor on McKinley's summit. Such claims are often met with equal vigor from the opposite side. In 1956 mountaineer Walt Gonnason was hired by Mrs. Vetter, Dr. Cook's daughter, to retrace her father's route. The expedition failed to reach their goal, attaining a height of 11,400 feet. Yet Gonnason departed the mountain convinced Cook had indeed reached the summit (Gonnason 1994, 22-25). Gonnason returned to McKinley in 1994 as consultant to a Cook Society expedition that would once again try to retrace the Doctor's trail. The team, led by a small group of world-class mountaineers, failed to successfully climb Cook's route. Yet members of the Frederick A. Cook Society believe that a sketch found in Dr. Cook's diary resembles that of a peak identified by the team from a point Cook would have traversed on his way to the summit. The sketch, and additional narrative information presented by the Society does little, however, to bolster Cook's position (Cook 1996; Bryce 1998, 41-82).

Dr. Bradford Washburn, widely considered to be the authority on Mt. McKinley, has been chief among Cook's critics. In 1955 he began a meticulous investigation of Cook's 1906 expedition, locating and photographing, for the second time, the "fake peak." ***[FIGURE 5]*** Over the last four decades Washburn has succeeded in locating the site of each of Dr. Cook's photographs, supporting those assertions made by Browne and Parker. Similar investigations of the "fake peak" were carried out by mountaineer, scholar, and former editor of the American Alpine Journal, H. Adams Carter, in 1957. Carter's photographs serve to reinforce those positions held by Browne, Parker, and Washburn (Washburn, 1958). ***[FIGURE 6]*** In 1996 Litton Itek Optical Systems of Lexington, Massachusetts applied the most advanced image analysis equipment and expertise to this controversy. Itek has been involved in many high profile image evaluation cases, including the assassination of President Kennedy, the Patty Hearst bank robbery, and the Space Shuttle Challenger disaster. Itek's Image Science Department "found that in all cases the modern photos matched the images in Dr. Cook's 1907 publication" (Litton Itek Optical Systems 1996, 2).

Dr. Cook's "summit" photograph was compared to those reproduced by Browne, Parker, and Carter. All four images were duplicated to make each image the same size. ***[FIGURE 7]*** The photos were then used to "visually overlay one image onto another to facilitate matching the features between any two images at a time. . . . Our conclusion," the report states, "is that these four photographs are, beyond a doubt, all of the same peak and were taken from nearly the same camera station" (Litton Itek 1996, 2). ***[FIGURE 8]*** The work of Browne and Parker, with additional investigative work by Carter and Washburn, has been validated by one of the most advanced image analysis labs in the world. ***[FIGURE 9]***

Yet there still exists a small group of Cook supporters who claim that even if Dr. Cook's "summit photograph" was taken a distance from the peak, it does not mean that he failed to reach the summit. Perhaps the Doctor was merely illustrating his ascent and summit victory, the argument goes, on some minor peak so that he would have a visual reproduction of the summit scene (Heckathorn 1995, 35; Cook-Dorough 1995, 37). The society forwards many reasons why Cook would have staged the scene, including bad film packs, cold temperatures, and bad weather. Yet the Doctor does not mention staging his photograph, nor does he indicate any equipment problems. In the thirty-four years between the 1906 climb and his death in 1940, not once did Dr. Cook offer such a defense of his photographic evidence. Indeed, the Doctor stated clearly that his narrative and photographs were a true and accurate portrayal of his expedition. ***[FIGURE 10]***

Although Peary was christened the true discoverer of the North Pole, haunting questions regarding his claim continue. Moreover, embarrassing family issues dogged Peary throughout his career. News that he had fathered a son while in Greenland, as did his expedition partner Matthew Henson, added to his public and private troubles (Counter 1991). And what of Amundsen, discoverer of the Northwest Passage and South Pole who long had dreamed, and indeed, prepared his entire life to reach the North Pole? A bitter-sweet victory for reaching the "wrong Pole," and then chastised for encroaching on Scott's exclusive rights to the continent. Scott perished not because Amundsen challenged him for the Pole, but because of so many other factors, not the least of which included improper preparation, improper equipment, and his unwillingness to utilize dogs and sledges in favor of ponies and mechanized tractors. Scott's Polar party was doomed. But in death, he and his men became heroes.

The controversy simmers to this day, occasionally coming to a boil and spawning new generations of loyalties and alliances. Ironically, even Peary's claim to the Pole is now questioned, with historians, scholars, and diehard believers combing expedition notes and diary entries for new interpretations and evidence that will lay to rest the question of who reached the Pole first (Bryce 1997; Eames 1973; Herbert 1989; Hunt 1981; Molett 1996; Rawlins 1973; Wright 1970).

Sadly, the Doctor is remembered primarily for what are now generally recognized as hoaxes, rather than as a brave and resourceful explorer, which he also was. Peary, perhaps the true discoverer of the North Pole, is viewed with cynicism as a possessed man, hell-bent to reach the Pole and not beyond public and private manipulation to claim credit for what he believed was rightfully his. Amundsen's exploration record stands for itself, but the human drama surrounding his own accomplishments and his disappointment in not reaching the North Pole made those personal victories hollow.

The story of the North and South Pole, Mt. McKinley, and the men who figured in these heroic events, appeals to the romance in our nature. The romantic figure of the explorer, hardships endured, victory and tragic death, all touch something very simple yet dynamic in us. What makes stories of exploration intriguing is not the lists of equipment, or even the geographic or scientific knowledge gathered. We search for and grasp the humanity in such endeavor. We identify and analyze the strengths and weaknesses of our heroes, and measure them against our own perceptions and norms. We are intrigued by those willing to place their lives in jeopardy, yet wonder about and perhaps condemn them for possessing strong egos or for their hunger for public attention. And, as we have seen with

Dr. Cook, exploration has had many casualties. Perhaps it is time we celebrate Dr. Cook's true accomplishments, of which there is a good deal we know with certainty. Those who support this idea should find creative and public ways to underscore Dr. Cook's contributions to ethnography, medicine, and exploration. Similarly, those who have condemned Cook to a footnote in the annals of exploration are doing him and history a disservice by not objectively exploring a rich part of our collective history and heritage in the North.

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List of Figures:

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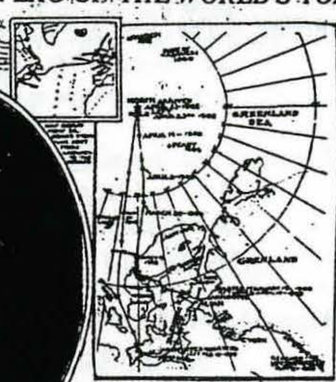
[1] Figures 2 through 10 used with permission of Bradford Washburn.

THE NEW YORK HERALD

NEW YORK, THURSDAY, SEPTEMBER ... TWENTY-FOUR PAGES

THE NORTH POLE IS DISCOVERED BY DR. FREDERICK A. COOK, WHO CABLES TO THE HERALD AN EXCLUSIVE ACCOUNT OF HOW HE SET THE AMERICAN FLAG ON THE WORLD'S TOP

DR. COOK AS HE APPEARED JUST BEFORE SAILING



Fighting Famine and Ice, the Courageous Explorer Reaches the Great Goal

Finds a New Highway, an Interesting Strip of Animated Nature, Big Game Haunts and a Triangle of Land of 30,000 Square Miles.

ACCOMPANIED BY ONLY TWO ESKIMOS AND TWENTY-SIX DOGS IN LAST DASH

Obstacle After Obstacle Is Overcome Until at Last the Triumph Comes and the Stars and Stripes Are Set Waving on the Summit of the Earth.

HUNGER TORTURES ON THE HOMEWARD JOURNEY

NOTICE TO PUBLISHERS.

The Torture of the Cold.

Beyond Where Life Is.

The Weary Struggle.

The Start for the Pole.

The Continuous Lucky

The North Pole the Most Cheerless Spot That Can Be Imagined, Says Dr. Cook

When the Discoverer Stood at Last on the One Point That Has Stirred the Ambitions of Centuries His One Feeling Was Intense Loneliness.

NO NORTH, NO EAST AND NO WEST THERE; ALL SOUTH, NO MATTER WHICH DIRECTION

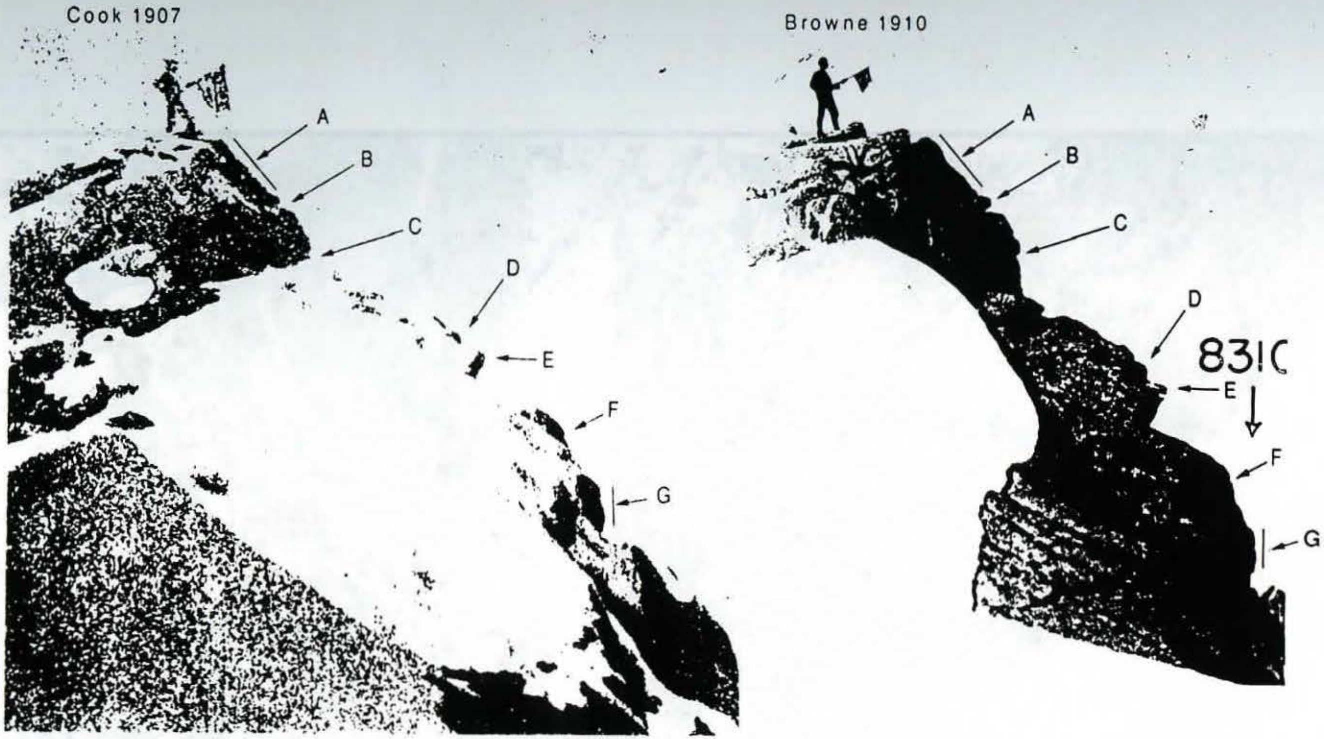
HOW THE NORTH POLE LOOKS

Nearing the Great Goal.

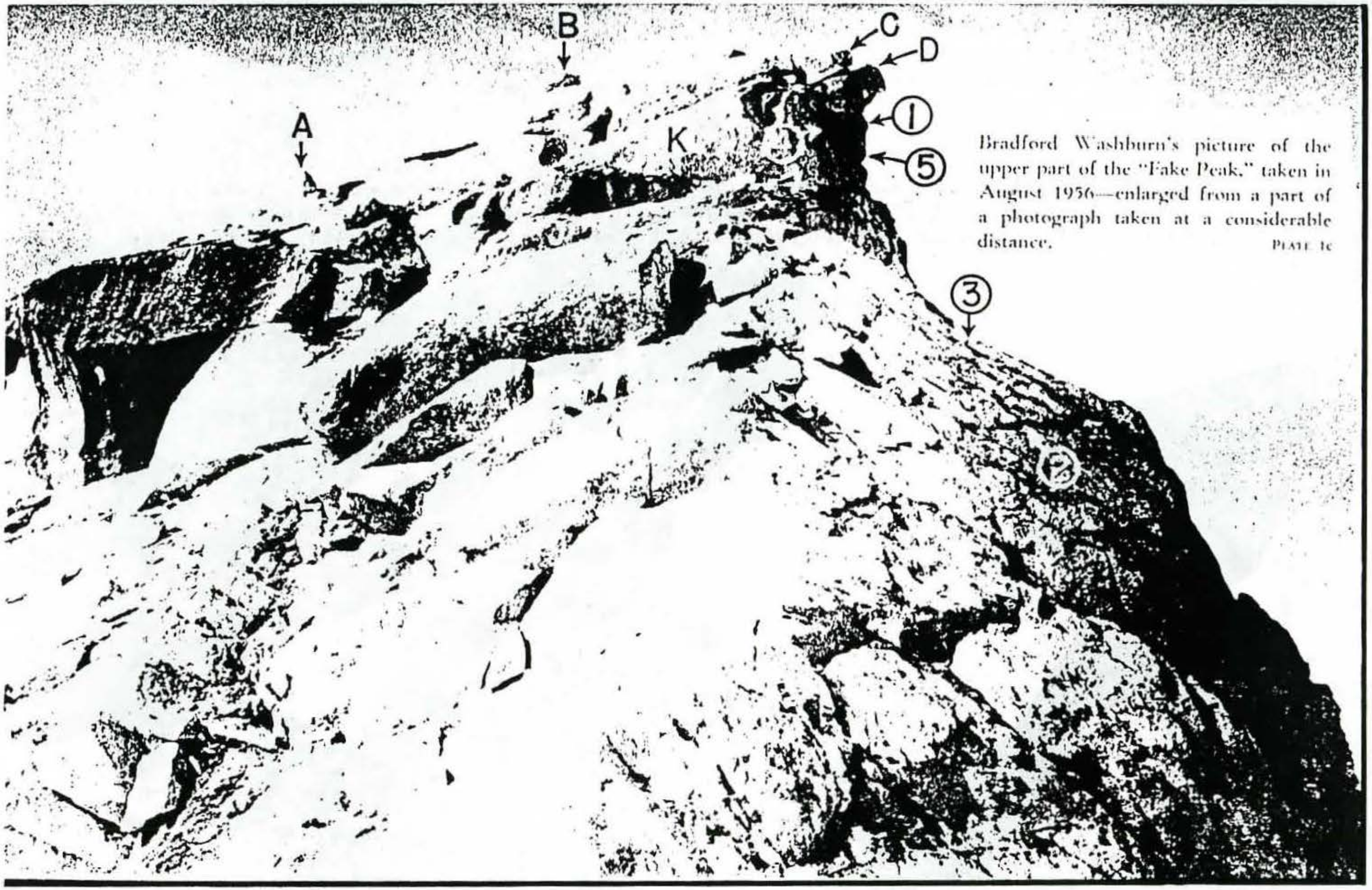
The Herald Gets First Story of Finding of North Pole

The upper part of Dr. Cook's controversial photograph of Edward Barrille on the summit of Mt. McKinley in September 1906 (from a duplicate negative—original negative appears to be missing).

PLATE 1a



Features along right-hand profile provide clear match between Cook 1907 and Browne 1910 photographs. (Note" "8310" with arrow beneath on Browne photograph. not an annotation).
Identical features also visible within interior, although not annotated here to provide unobscured view.



Bradford Washburn's picture of the upper part of the "Fake Peak," taken in August 1956—enlarged from a part of a photograph taken at a considerable distance.

PLATE 1c

(a)

(b)

(a) Cook 1907

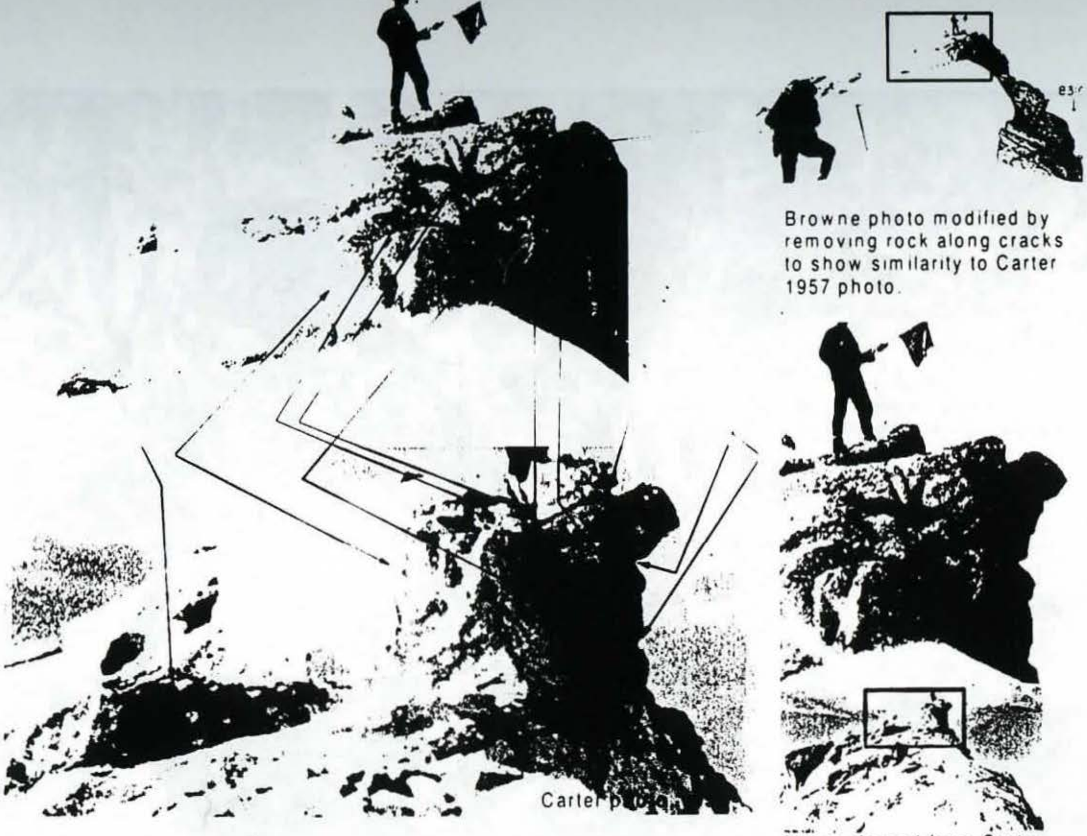
(b) Browne 1910

(c) Parker 1910

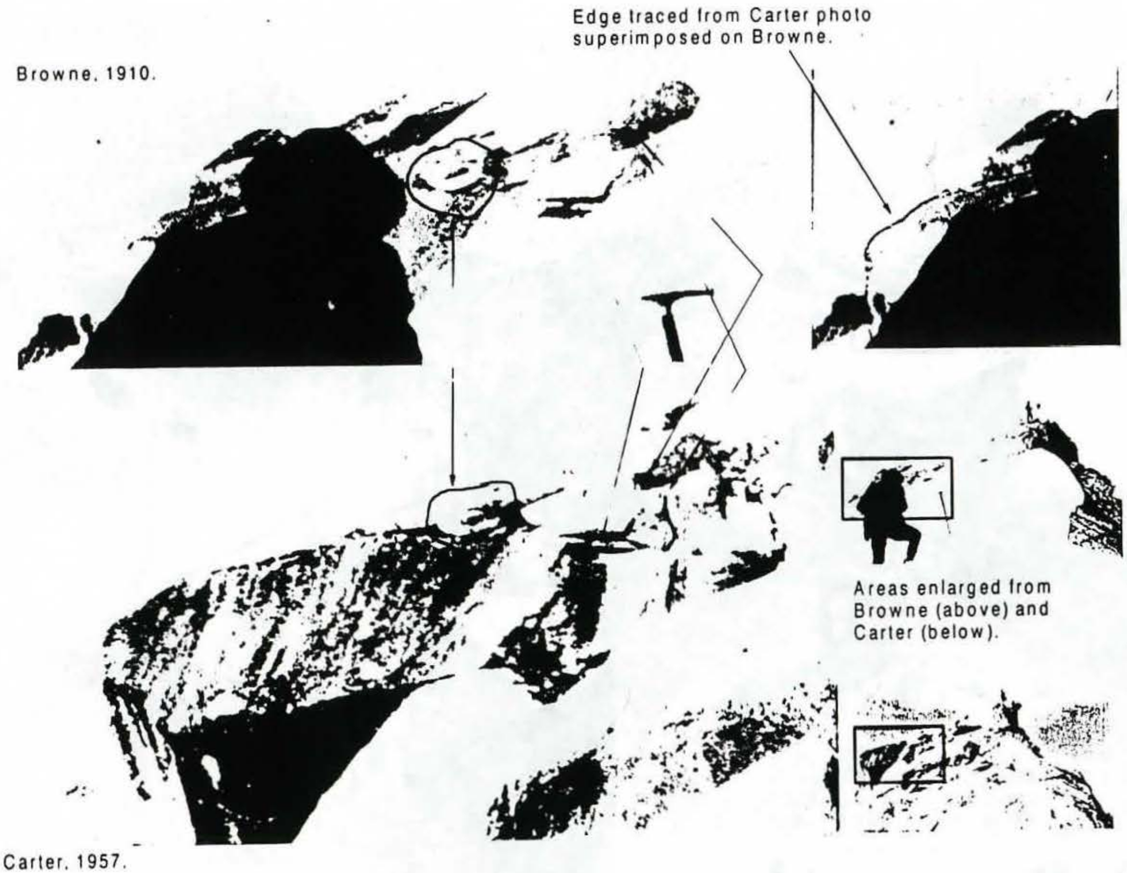
(d) Carter 1957

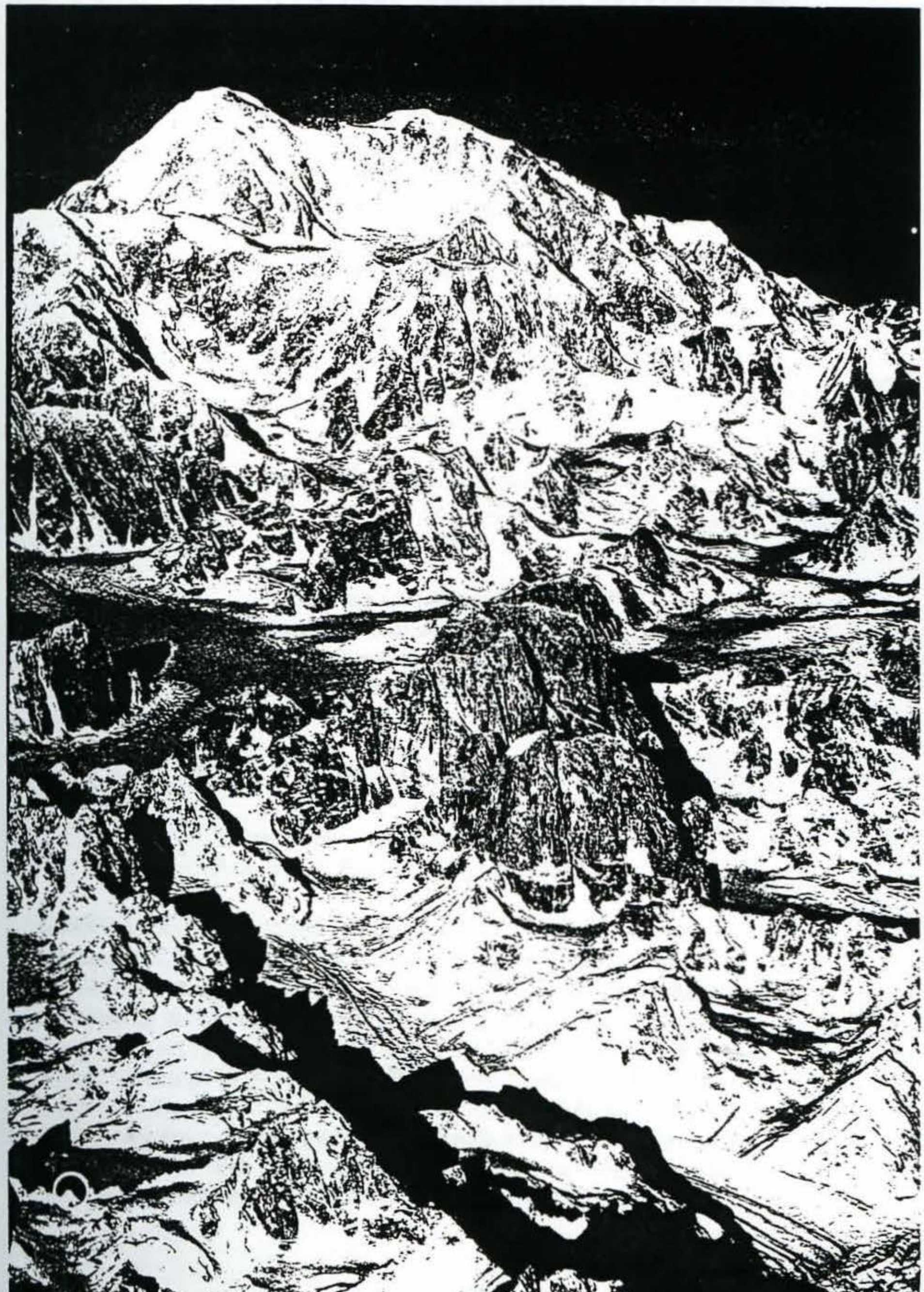
Belmore Browne photo. June 28, 1910

Area enlarged from Browne.



Area enlarged from Carter.


Browne, 1910.
Edge traced from Carter photo superimposed on Browne.
Areas enlarged from Browne (above) and Carter (below).
Carter, 1957.



CIRCUMPOLAR ACTIVE-LAYER PERMAFROST SYSTEM (CAPS): A GLOBAL GEOCRYOLOGICAL DATABASE ON CD AND INTERNET – (POSTER)

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ABSTRACT: The Data and Information Working Group of the International Permafrost Association (IPA) is coordinating a major state-of-the-art review of frozen ground-related data and information culminating in the launching of a CD at the Seventh International Conference on Permafrost, June 1988 in Yellowknife, N.W.T., Canada. Titled "Circumpolar Active-Layer Permafrost System (CAPS)", the CD is intended for a broad audience including the scientific and engineering communities, educators and policy makers. It is available through the IPA Web site (www.soton.ac.uk/ipa), and will be available for demonstration at the Polar Libraries Colloquy in September 1998.

The contents include:

- the digital version of the IPA Northern Hemisphere permafrost map and digital permafrost maps of Alaska and Switzerland;
- a cumulative bibliography of permafrost literature spanning 1978 - 1997;
- a twelve-language glossary of frozen ground-related terms (including Icelandic);
- a bibliography and index of more than 700 Russian permafrost maps;
- the Global Geocryological Database (GGD), currently containing 180 descriptions of permafrost and ground ice-related data sets held by individuals and organizations around the world;
- approximately 40 selected data sets of active layer and borehole temperature profiles, representative of important time series from many of the member countries of the IPA.

The IPA is a 22-member non-governmental organization founded in 1983 to disseminate knowledge of permafrost, seasonal frost, artificial ground freezing, and periglacial phenomena. One of the IPA's long-term goals is to retrieve, organize and disseminate frozen ground data at local, regional and global scales. To accomplish this, its Working Group on Data and Information has been developing the Global Geocryological Database (GGD), which will ultimately be an internationally distributed system of linked data centers or nodes, partnering in particular with the Web-based International Arctic Environmental Data Directory (known as ADD), with the World Data Centers, and with polar libraries through the Polar Libraries Colloquy. The use of the Web as the "advertising service" – making known the existence of permafrost data and information -- and as the access tool -- to deliver that data and information -- fosters broader awareness of the information for science and engineering, education, policy-making, and even general public use.

Future projects of the Working Group will focus on identifying and making accessible Antarctic active layer, permafrost and periglacial data. Because the ADD is forging links between itself and the similar Antarctic Master Directory (AMD, hosted in Christchurch, New Zealand), the IPA intends to continue its own active participation in both, seeking to improve permafrost data and information access within a bipolar context.

The WDC-A for Glaciology [Snow and Ice] coordinated development of GGD and production of the first CD-ROM, with partial support from several NSF and NOAA grants. The GeoData Institute, University of

Southampton, developed and maintains the IPA Web site (www.soton.ac.uk/ipa). This site includes text from the semi-annual issues of the IPA News Bulletin "Frozen Ground" and reports of the IPA Working Groups, as well as providing online access to the GGD and to many of the data and information products on the CAPS CD.

THE LAPLAND RESEARCH NETWORK AT YOUR SERVICE - POSTER

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ABSTRACT: The purpose of the Lapland Research Network is to promote research directed towards and within the area of Northern Finland, as well as to link research findings with its practical applications to the economy.

The activities of the network are multidisciplinary. It coordinates northern research of different fields and disseminated information dealing with Lapland for use by decision-makers and the public.

The network has been developed by collecting information on research units, so that researchers and those seeking research information can acquire knowledge of research done in Lapland, and linking these two sources through an information distribution process: a metadatabase and directory of research units, researchers and ongoing research in Lapland and their addresses.

The Lapland Research Network home page available on the internet familiarizes you with these research units and, also connects you to other arctic networks: http://www.urova.fi/home/arktinen/lts

THE SHACKLETON MEMORIAL LIBRARY AT THE SCOTT POLAR RESEARCH INSTITUTE: A NEW INTERNATIONAL RESOURCE FOR THE STUDY OF THE POLAR REGIONS

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Abstract: The Shackleton Memorial Library is a major extension to the existing Institute library. It is dedicated to the memory of the explorer Sir Ernest Shackleton and his son, the statesman and explorer, Lord Edward Shackleton. In addition to providing space for the rapidly growing library, archives and photographic collections, a special facility is included to accommodate up to 17 Visiting Scholars. Networked access will be provided to a range of in-house and Internet information resources. This poster outlines construction developments since the start of building in September 1997. The associated new information resources are described at this conference in the paper *SPRILIB MULTIMEDIA: new databases at the Scott Polar Research Institute.* The Shackleton Memorial Library will be opened officially on 20 November, 1998.

SCIENTISTS' ACCESS TO INFORMATION AND THEIR INFORMATION-SEEKING HABITS – POSTER

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ABSTRACT: Both qualitative and quantitative methodology was used to research access of scientists to information and their information seeking habits. The scientists work in small research institutes (with staff from ca 35 to 120) in the natural sciences in Iceland. In-depth unstructured interviews with 15 scientists, Sept. 1996 to May 1997, showed great difference in varieties of methods in gathering information. Most scientists agreed that the invisible college; contacting colleagues, working in national or international groups and attending conferences and meetings, were the most important factors in keeping up to date. Some relied solely on colleagues but other were

eager information hunters and used a wide variety of methods. Almost all regularly scanned 2-11 journals.

A mailed questionnaire sent to 85 authors of scientific articles working in five research institutes in the natural sciences showed the same tendency. The scientists became first aware of the majority of foreign articles they cited in papers, published 1994 and 1995, through references in the literature (38%) and colleagues (25%). Colleagues provided them with 21% of the papers they referred to but library subscriptions and interlibrary loans were most important, covering 60% of their citations. Searching databases and browsing in the literature did not count much but the interviews showed that the multiple effects must not be forgotten.

Citation analysis of almost all papers of scientists in the same five institutes confirms these findings. Over 60% of cited foreign literature in 1994 and 1995 can be found in relevant libraries. The libraries covered 83% of Icelandic citations.

Difference between the libraries ranged between 44% and 78% in accessibility to foreign cited journals. It can be explained by the fact that scientists served by the library that only covered 44% of cited journal articles referred to about 255 journal titles, while scientists in the other institutes cited between 90 and 175 titles. Locations of cited foreign journals in the NOSP-catalog (Nordic Union Catalog of Serials) showed that 95% of citations to foreign journals could be found in other libraries in Iceland or in other Nordic countries. Interlibrary loans between the Nordic countries are relatively easy and cheap and are widely used in the libraries concerned. These findings show that cooperation between scientists is important and for Icelandic libraries cooperation between Nordic libraries is vital.

WLN RELEASE POLARPAC5 TO THE POLAR INFORMATION COMMUNITY – POSTER

Sharon West
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ABSTRACT: In September 1998, WLN Inc., with the assistance of the Elmer E. Rasmuson Library, University of Alaska, Fairbanks, released the latest version of PolarPac--edition 5. PolarPac, first issued in 1992, is an international bibliographic database on CD-ROM. PolarPac contains bibliographic records citing topics of interest to Polar

researchers--including geological, biological, and historical works, as well as titles relating to the indigenous peoples of the North.

PolarPac5 continues the development of the international aspect of polar information. It contains all the references included in previous editions of PolarPac with additions from collections in Russia, Finland, Greenland, Denmark, Norway, Canada, and Sweden. This poster presentation will illustrate the breadth and depth of information contained on the PolarPac5 CD-ROM. The author of the session has been involved in PolarPac development since its inception and will be available to discuss it past, present, and future.

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