



**Canadian Association of Special Libraries
and Information Services**

Libraries and Publishing 3.0

**Student Views from the
School of Library, Archival and Information Studies,
The University of British Columbia**

Occasional Paper Series No. 1

October 2008

www.special-libraries.ca



Our Mission

The Canadian Association of Special Libraries and Information Services (CASLIS) exists to support and strengthen the community of Canadian information professionals who serve specialized clientele or work in specialized settings.

CASLIS provides opportunities for learning, information exchange and networking to its members.

CASLIS is an advocate for its community and promotes the value and skills that its members offer to employer organizations and the public.

Our Vision

We are the association of choice for Canadian information professionals who serve specialized clientele or work in specialized settings. CASLIS is a vibrant, dynamic, visionary organization with a large and active membership. CASLIS is recognized universally as an innovator among library associations in the delivery of world-class programs and services. CASLIS also fosters understanding and appreciation of our membership's professional expertise.

Libraries and Publishing 3.0

Student Views from the
School of Library, Archival and Information Studies,
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Papers presented at 63rd Annual Conference and Trade Show
of the Canadian Library Association

21-24 May 2008
Vancouver, British Columbia

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www.special-libraries.ca

ISBN 978-0-88802-328-5

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Copy Editor: Heather Elgee

Published by:

Canadian Association of Special Libraries and Information Services
c/o Canadian Library Association / Association canadienne des bibliothèques
328 Frank Street
Ottawa, Ontario K2P 0X8

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The arrival of the Digital Revolution, and with it a brave new world of technological tools, has meant a fundamental shift in the way we conduct our information business. Publishing a special collection online is a great way to let a far-reaching audience experience materials that may otherwise be hidden away, but the process is a little more complicated than just scanning a few images and posting them on the web. Educationally rich and engaging digital environments should be the goal of every librarian or archivist who looks to venture into cyberspace. *Historical Collections 2.0: From Information to Understanding* presents an overview of current online collections, highlighting common trends and issues, as well as a challenge to realize the full rich promotional and pedagogical potential of this environment.

Digital Copyright and Indigenous Cultural Ownership

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In environments of technological flux, cultural boundaries are often forced to undergo rapid changes, with resulting economic and social benefits unevenly distributed. References to "digital divides" frequently highlight such concerns in economic terms; however, other imbalances exist. In Aboriginal communities, the transgressive significance of misappropriating Aboriginal symbols, stories, artwork, and songs underscores indigenous peoples' desire to prevent further fragmentation of their accumulated knowledge. But given the inherent permeability of "culture" as an ideological construct, what does it mean to protect Aboriginal heritage? Do rules for ownership change when new technologies arise?

This presentation briefly examines the use of Western copyright law to protect the artistic and intellectual heritage of indigenous peoples. Modern threats to cultural control will be discussed, such as the ease of reproducing information digitally and the Internet's capability for immediate and widespread dissemination of information. Examination of these conflicts reveals that despite its many merits, universal access to knowledge is not universally beneficial.

As cultural caretakers in their own right, archivists, museum curators, and librarians have an important role to play in the future of ethical information sharing. This presentation will demonstrate that successful handling of these emergent conflicts is contingent upon recognition of the complexities involved.

The Impact of the Open Access Movement for Scholars in India

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Open Access (OA) has emerged as a response to the serials crisis, encouraging equal access to research, through a freely disseminated, digital publication model, such as the Institutional Repository and OA Journals, without copyright restrictions. In developing countries, such as India, which has a strong academic history, and information technology industry, Open Access is becoming regarded as an ideal publication method, particularly for PhD theses.

This presentation will provide a brief background of India's scholarly history, highlight several projects that promote OA, such as Vidyanidhi and the Public Knowledge Project, and how OA offers a solution to the problem of low visibility for research produced by Indian scientists, and the limited access they have had to international journals. Libraries also play a significant role by promoting this sharing of knowledge, and in India librarians have been active in encouraging the development of Open Access in an organized manner, with peer review standards.

Through global, scholarly collaboration, both developing and developed countries have much to gain, and it is hoped that in the situation of India, their economy as a whole will improve.

The Past, Present and Future of Scholarly Communication in Ornithology

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Ornithological (bird) studies are highly useful in studying human-environment interactions, effects of humans on biodiversity, and levels of toxins in our surroundings. Scholarly communications between ornithologists, authority figures, and the public have evolved and expanded with technological advances. Those advances have led to an explosion in available information and a corresponding explosion in the price to access quality information in peer-reviewed journals. Scholarly communication has also changed during this time and librarians have had to learn how to organize and keep up with the massive amounts of information, formal and informal, to properly serve researchers' needs. Open access publishing and institutional repositories are viable options for sharing and preserving scholarly information, so that everyone with access to a computer with an internet connection is able to take part in this research revolution, regardless of income. Libraries are working on making the information available to everyone who needs it so that we can advance our scientific knowledge and keep our planet healthy.

Google Scholar: An Outcast in the Library World

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Since it was introduced in beta mode in 2002, Google Scholar has received a range of reactions from the academic and library communities. Students and researchers flocked to the site, taking comfort in its familiarity and easy-to-use search box. Librarians on the other hand, have been much more cautious in their approach. They were worried about its 'secretive' nature, and were concerned that library users would begin and end their information searches with Scholar, unaware of and uninterested in the wealth of information they might be missing. In recent years, however, numerous studies on Scholar have appeared in the literature, many of which are content analyses that compare Scholar's results with a host of other search tools. In many cases, these content comparisons demonstrate that researchers in the library community are prejudiced against Scholar and its services. Ultimately, this paper aims to show that Google Scholar is an undervalued search tool that has found acceptance in nearly all scholarly communities except for the library.

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About the Authors

Tania Alekson is an MLIS candidate at the UBC School of Library and Information Studies who hopes to find a digital opportunity in the near future. She has an interdisciplinary background in History, English Literature, Film Studies, and Communications.

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Mê-Linh Lê has recently completed the first year of her MLIS degree. She also holds an MA in Anthropology from the University of Alberta. Before finishing the final year of her studies, Mê-Linh is working at the UBC Library Development Office.



Back row (L-R): Tania Alekson, Francesca de Freitas, Erin Abler

Front row (L-R): Natalie Porter, Mê-Linh Lê, Christina Struik

Photo courtesy of Miriam Moses

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Historical Collections 2.0: From Information to Understanding

Tania Alekson

The arrival of the Digital Revolution has meant a fundamental shift in the way we conduct our information business. The keepers and disseminators of historical information - and by this I mean librarians and archivists, educators and academics - have been given an opportunity to go global with their goods as each year publishing online becomes a more realistic goal for collections both large and small. Special collections of historic materials have previously been held in dark, cool spaces away from the sticky hands of the general public. These collections represent a direct connection to the past, a place which has great intrinsic value in our hyper-driven present, and any attempt to make them public must be applauded.

However, presenting a historical collection online is no simple task. The first steps for most digitization projects seem to follow a similar pattern: scan a few documents and images, put them into a database, upload the whole thing to a URL, and hope users come by to see the collection. Unfortunately, this approach produces websites which can be difficult to navigate and impossible for the average browser to truly understand. They make the crucial mistake of substituting information for knowledge or, worse, of confusing information and understanding.

The translation of historical materials to a digital mode must entail an honest effort to avoid presenting the collection as just raw data or simple information, but to use the technological tools at our disposal and the expertise available to create true historical dialogue. Too many of today's collections are presented online with no contextualization, no intuitive architecture and little possibility for non-experts to really engage with the materials. By taking the next step to enrich the presentation of the items, and to allow for meaningful interaction between the end user and history, we can create an online environment

which fosters a greater understanding of ourselves as human beings and begins to make sense of the civilization we now inhabit.

ASSOCIATIVE ASSEMBLAGES

As we think about the next steps in the evolution of history on the internet, it is interesting to look back at our past perceptions. In 1997's "From Writing to Associative Assemblages", David J. Staley expresses the drastic pronouncement that many shared upon engaging with the World Wide Web for the first time: "Western culture has severed its dependence on the written word" (Staley 3). In his opinion, the internet was a perfect breeding ground for a more complete historic representation as "the electronic environment emphasizes and places value on visual skill and associative thought, as opposed to written skill and linear thought".

In the decade since Staley envisioned an internet full of "associative assemblages", the reality of many online historical spaces falls below those lofty ambitions. Staley thought that "electronic tools alone...have not provided historians with the cognitive skills necessary for elegant communications with these tools" (Staley 3). At the same time, de-contextualized collages of historical images which offer no explanation or background are a hard slog for the average browser, even those with an interest in the subject. It would seem that collaboration is required for the full realization of history in the digital environment: a collaboration between those with superior written skills in this area, that is, historians, and those with the illuminating materials required for associative assemblages, that is, digital librarians and archivists.

WHY PUBLISH A COLLECTION ONLINE?

Another crucial factor in the pursuit of online

excellence is a clear understanding of the purposes for historical websites. If we are to move to a new, richer mode of presentation, we must understand to whom we're presenting and why we're presenting at all. Preservation, pedagogy and promotion are the main reasons historical collections go online, especially those with a real stake in seeing history flourish on the web. Usually these sites have to prove their worth statistically to their funding bodies and therefore need to connect with a wide ranging audience – not just scholars and other experts – by providing a rewarding browsing experience.

PRESERVATION

Preservation is one major impetus for digitization and its by-product is access. By presenting archival materials on the internet, they can be seen, cited, and remembered. For many archivists, digitizing "is simply a means of copying original materials" as the "permanence and authenticity" of the original item is only preserved with true integrity in its original form (Smith). However, there are many aspects of a historical item that can be preserved through creating a digital copy. Digital reproduction should not be seen as the only method of preservation, but it should be considered a vital one. By publishing digitized representations of original materials, and providing adequate metadata to facilitate their retrieval and interpretation, the impact of these materials is multiplied exponentially. In one extreme example, the Library of Congress' American Memory site had 15 million viewers in 2003 alone – far more than could have ever walked into their reading room in its 200-year history (Cohen and Rosenzweig).

PEDAGOGY

One of the most important purposes behind presenting history on the web is education. The immediate goal of an enhanced presentation of history online should be to move the user from information to understanding. Some creators of history websites seem to be in agreement on this point as they actively seek to engage in a dialogue with users, and have pedagogical aides

sown into their fabric or made available in a section within the site. However, these resources are expensive and difficult to put together and some sites that purport to attempt education actually achieve little more than presentation. Another major difficulty is trying to pitch your collection to an audience that may include children, amateur enthusiasts, educators, researchers, and other experts. How do you engage your emerging young scholars without losing your professional ones?

PROMOTION

Today's marketplace ethos is a tricky one for some types of organizations to navigate. Libraries and archives find themselves requiring a higher profile presence in their communities in order to remind people of their existence, to convince them of their continued relevance and to justify their ongoing funding. Moving online with their collections is one way that libraries and archives can prove their worth to future generations. A documented by-product of the promotional work done by and for online collections can be an increase in material donations. (Schlumpf and Zschernitz) A richer, more meaningful historical presence creates not only a positive impression of and confidence in the publishing organization (s) but also generates crucial site traffic (Gemmill and O'Neal).

THE TECHNICAL TOOLBOX

Moving from the "WHY" to the "HOW" of presenting collections online, more than a decade into the internet revolution, we are not only dealing with the repercussions of 'information overload' but also with the continually mutable landscape of technology. As every day seems to bring new high tech gadgets for us to toy with, it is difficult to get a firm grasp on their significance to our work. The number and complexity of the tools available to historians, archivists and information specialists is an on-growing phenomenon.

Two-dimensional Representations of Documents, Multi-media Recordings, Databases, Graphs,

Timelines, Maps, GIS (Geographical Information Systems), three-dimensional re-creations, and Social Web products like Blogs, Wikis and Tagging are all tools that should be considered when going online with our collections. The most recent of these technologies allow for an amazing degree of interactivity for the user, allowing browsers to participate in history and integrate online collections into their cyberspace worldview.

One example of this in operation is at the Ohio Memory Project, where they have developed the My Scrapbook feature. Not only can browsers pick and choose their favourite historical items or bring together an era for themselves in their own designated online 'space', but the site offers preselected groupings that range from fun to thought-provoking and on one occasion includes notes from duelling perspectives: a classroom educator and a digital collections manager. Applications like the Ohio Memory Online Scrapbook pull browsers old and young into history, allow them to reshape it to reflect their own interests and perspective, and then facilitate publishing that viewpoint.

CHALLENGES TO SUCCESS

Before we can start improving history on the web, we need to understand the key challenges of the undertaking. A 2005 issue of *Library Hi Tech* entitled "Collaborative Digitization Projects" is recommended reading for anyone looking to embark on a new venture in this area as its articles attempt to shed some light on recent online history projects and the issues they faced in bringing collections to the internet.

Funding is the first and largest issue standing in the path of publishing a historical collection online, whether it is bringing value-added services to the table or not. Costs to put together the simplest site include design, hardware, software, digitization, cataloguing, content creation, ongoing updates and management, and promotion or outreach (Schlumpf and Zschernitz, Gemmill and O'Neal). Without strategies that look further afield than the home organization or in-

stitution, funding can be an impossible barrier to cross.

As reported in several ongoing projects, one option to overcoming funding issues is building coalitions and consortia with other like-minded organizations. This can add staff, collections and technological resources to bridge gaps and to bolster offerings (Schlumpf and Zschernitz, Gemmill and O'Neal). Other options include learning from the experience of previous projects by bringing them on as partners (Jones), and adhering to "sound business practices, market studies, and strategic planning" (Hartman et al), including setting up revenue-generating side projects.

While working with other organizations can be enriching and enables a pooling of resources, coalitions bring challenges as well. Before the disparate collections can come together, a common metadata schema has to be chosen, crosswalks devised and each member organization must bring their materials within the prescribed framework or surrender the materials to be digitized and catalogued (Gemmill and O'Neal). The selection process for materials can be tricky when there is only one collection to sort through. When multiple collections come together, a centralized selection body is advocated to maintain clarity of vision (Gemmill and O'Neal). A centralized approach can also achieve quality control, as working with amateur digitizers and cataloguers (often the case in smaller libraries and archives) requires a lot of training. Compounding the issue is distance, which may mean that training and ongoing supervision have to be conducted remotely (Jones).

Just the mention of the two letters, "IT" brings fear to the hearts of many. Keeping abreast of the latest technological advancements is crucial to creating a fresh, well-travelled website. Unfortunately, many of these tools are expensive to implement and the work cannot be done by IT amateurs, especially as newer and more complicated interactivity becomes the desired norm. An additional barrier to cross is copyright: "copyright law is extremely complex and frequently misunderstood." (Gemmill and O'Neal).

Most of the ventures outlined in “Collaborative Digitization Projects” found that their choice of items was limited by this issue (Jones, Hartman et al, Gemmill and O’Neal). Copyright is another area where working as a consortium presents problems. Not all staff at all organizations understand copyright issues or feel qualified to make judgements on whether or not something is in the public domain. Often copyright status must be determined on a case-by-case, piece-by-piece basis. This process can be time consuming and frustrating (Gemmill and O’Neal).

BC HISTORY DIGITIZATION PROJECT

Here in BC, the Barber Learning Centre at UBC has taken a lead role in bringing the historical collections of this province to the web. Providing matching funds to qualifying ventures, the Project distributed over \$100,000 in 2007 and is set to distribute \$200,000 more in 2008 (UBC BC History). Anchored with key people from UBC’s own digital staff, the team behind the project is pass-

ing along the experience they’ve gained in transferring UBC special collections to an online environment. The application process is being used to guide the various historical societies, libraries, archives and museums in the required know-how, and the ongoing assistance of site hosting is offered as well (Neame). While the project has limited its scope to focus specifically on getting collections online and freely accessible, coordinator Simon Neame sees this as providing a solid framework on which to build – perhaps moving forward with more enriched presentation in the future.

Considering the project’s naissance, I think we can be generous in our expectations. However, I sincerely hope that the time for taking advantage of all the tools and knowledge at our disposal to enhance the presentation, educational value, and interactivity of these sites is not *too* distant. Starting simple is wise, but only when its full potential is realized will online history come alive.

RESOURCES

For organizations and individuals looking to create an online digital history resource or to conduct research in a digital environment, there is help. Below some online and print materials designed to get historians, librarians and archivists started on the 2.0 path.

BC History Digitization Project

<http://www.ikebarberlearningcentre.ubc.ca/ps/BCDigitInfo.html>

The Arts and Humanities Data Service (AHDS), History Division

<http://ahds.ac.uk/history/index.html>

(print versions of Good Practice Guides available)

Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web

by Daniel J Cohen and Roy Rosenzweig.

<http://chnm.gmu.edu/digitalhistory/>

Digital History (University of Nebraska-Lincoln)

<http://digitalhistory.unl.edu/>

Library of Congress, Technical Information Page

<http://memory.loc.gov/ammem/about/techIn.html>

Using Computers in History by Sonja Cameron and Sarah Richardson (2005: Palgrave Macmillan)

EXAMPLE SITES

Colonial Williamsburg - Virtual Williamsburg.
<http://research.history.org/DHC/VW.cfm>

Digital History – Timeline.
<http://www.digitalhistory.uh.edu/timeline/timelineO.cfm>

DoHistory.
<http://dohistory.org/>

Great Unsolved Mysteries in Canadian History.
<http://www.canadianmysteries.ca>

Ohio Memory - An Online Scrapbook.
<http://www.ohiomemory.org/>

Our Future, Our Past: The Alberta Heritage Digitization Project.
<http://www.ourfutureourpast.ca/>

BIBLIOGRAPHY

Bellinger, Gene, Durval Castro, and Anthony Mills. "Data, Information, Knowledge, and Wisdom." *Mental Model Musings*. 2004. <http://www.systems-thinking.org/dikw/dikw.htm> (Accessed: March 12, 2008)

Cohen, Daniel J and Rosenzweig, Roy. *Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web*. University of Pennsylvania Press. 2005.
<http://chnm.gmu.edu/digitalhistory/> (Accessed: March 3, 2008)

Gemmill, Laurie and O'Neal, Angela. "Ohio Memory Online Scrapbook: creating a statewide digital library." *Library Hi Tech*. 23 (2005): 172-186

Gertz, Janet. "Preservation and Selection for Digitization." *Northeast Document Conservation Center*. 2007. <http://www.nedcc.org/resources/leaflets/6Reformatting/o6PreservationAndSelection.php> (Accessed: March 3, 2008)

"Graham, Shawn, University of Manitoba." *Digital History*. University of Nebraska-Lincoln, Department of History. September 22, 2006. <http://digitalhistory.unl.edu/interviews/grahamint1.html> (Accessed: March 3, 2008)

Hartman, Cathy Nelson, Dreanna Belden, Nancy K. Reis, Daniel Alemneh, Mark Phillips, and Doug Dunlop. "Development of a portal to Texas history." *Library Hi Tech*. 23 (2005): 151-163

Jones, Ruth Ann. "Empowerment for digitization: lessons learned from The Making of Modern Michigan." *Library Hi Tech*. 23 (2005): 205-219.

Lutz, John Sutton. "Bed Jumping and Compelling Convergences in Historical Computing." *Digital History*. University of Nebraska-Lincoln, Department of History. May 2007.
<http://digitalhistory.unl.edu/essays/lutzessay.html> (Accessed: March 3, 2008)

Nardi, Bonnie and O'Day, Vicki. "Information Ecologies: Using Technology with Heart." reprinted in *First Monday*. 4, no. 5 (1999).
http://www.firstmonday.org/issues/issue4_5/index.html (Accessed: March 23, 2008)

Neame, Simon. Coordinator for Programs and Services, Irving K. Barber Learning Centre. Interview May 13, 2008.

Rosenbaum, Howard, "Library 2.0: The technology treadmill is speeding up" presentation at Webster University, 2006.
http://www.slis.indiana.edu/faculty/hrosenba/www/Pres/mlnc_o6/sldo14.htm (March 22, 2008)

Schlumpf K, Zschernitz R, "Weaving the past into the present by digitizing local history" *Computers in Libraries*. 27, no, 3 (2007).

Smith, Abbey. "Digitization is not preservation - at least not yet." In *The Whole Digital Library Handbook* by Diane Kresh. (Chicago: ALA Editions, 2007), 342.

Staley, David J, "From Writing to Associative Assemblages: 'History' in an Electronic Culture." In *Writing, Teaching and Researching History in the Electronic Age: Historians and Computers*, edited by Dennis A. Trinkle, 3-12. Armonk, N.Y. : M.E. Sharpe, 1998.

"Collaborative Digitization Programs." *Library Hi Tech*. 23 (2). 2005. from Emerald Insight.
<http://tinyurl.com/3ymunw> [subscription required]

Digitization of History Project website.
<http://www-histecon.kings.cam.ac.uk/research/digitization/index.html> (March 17, 2008)

Internet Archive - About. <http://www.archive.org/about/about.php> (March 16, 2008)

Library of Congress - American Memory - About.
<http://memory.loc.gov/ammem/about/about.html> (March 16, 2008)

Library of Congress - American Memory - Technical Information.
<http://memory.loc.gov/ammem/about/techIn.html> (March 16, 2008)

Ohio Memory - An Online Scrapbook. <http://www.ohiomemory.org/> (March 10, 2008)

UBC BC History Digitization Project website.
<http://www.ikebarberlearningcentre.ubc.ca/ps/BCDigitInfo.html> (May 14, 2008)

Digital Copyright and Indigenous Cultural Ownership

Erin Ablar

Hello, and thank you for being here today. I'm Erin Ablar, and I'm in the library program at SLAIS. Today I'll be guiding you briefly through a rather complicated issue, which is how copyright is being used by Indigenous peoples to protect cultural heritage. While there's a lot of ground to cover, it's important to remember that on all sides of this issue, there exist very human perspectives. With that in mind, I'd like to start with a story.

At the end of the 19th century, following contact with white settlers and gold seekers, native Haida populations along the West Coast of British Columbia stood decimated from the effects of smallpox. Whole villages were abandoned as individuals from various communities regrouped and attempted to recover (McMahon, 2004). Between 1897 and 1903, anthropologist George Dorsey and researcher Charles F. Newcombe entered Haida grave sites and retrieved human remains, which they intended to study as biological specimens. They also seized totem poles (McMahon, 2004). Driven by professional ambition and a fascination with the "exotic" North American Indian (McMahon, 2004), the two men eventually succeeded in building a collection of Haida skeletons and artifacts sizable enough to be dispersed to a dozen different museums (Skidegate, 2007).

For a century, these items remained out of reach of the Haida themselves, who knew of the collections but stood little chance of seeking redress (Skidegate, 2007). However, repatriation efforts began gaining strength in North America in the 1990s, and eventually the Haida garnered enough support to begin their own repatriation efforts (McMahon, 2004). In 2003, a Haida delegation travelled to the Field Museum in Chicago. There, they recovered the remains of 160 Haida ancestors, carefully honoring each before accompanying them back to Haida Gwaii, or the Queen Charlotte Islands (Skidegate, 2007).

Thankfully, libraries and archives do not make a practice of collecting human remains. But our collections do contain vestiges of these actions, whether in the form of unauthorized photographs appearing in textbooks or records of ceremonial events that were never meant to be codified. It is important to understand that issues of Indigenous cultural misappropriation draw on a long history of disenfranchisement.

Fragmentation

Indigenous scholars Marie Battiste and James Youngblood Henderson point out that differing worldviews can cause non-Indigenous people to overlook the powerful connectedness of Aboriginal experience and ancestral heritage. They write that "[i]n contrast to the colonial tradition, most Indigenous scholars choose to view every way of life from two different but complementary perspectives: first as a manifestation of human knowledge, heritage, and consciousness, and second as a mode of ecological order" (Battiste & Youngblood Henderson, 2000, p. 35).

This difference springs from the inseparability of knowledge (a "thing") and knowing (an "action"). Put simply, Indigenous knowledge cannot be separated from its bearers (Battiste & Youngblood Henderson, 2000, p. 36). Tied inextricably to its social and ecological contexts, such knowledge is imparted for specific uses, at specific times, and to specific people. As a result, "misuse of knowledge can be catastrophic, not only for the individual abuser, but for the people, the territory, and (potentially) the world" (Battiste & Youngblood Henderson, 2000, p. 67).

Western societies tend to categorize knowledge into subject areas, which is a view incompatible with that of most Indigenous peoples (Battiste &

Youngblood Henderson, 2000). Taking this into consideration, Indigenous knowledge is particularly vulnerable in digital contexts, where information can easily be broken down into atomistic fragments and rebuilt into something entirely different.

Changing rules

Since the invention of the World Wide Web in 1991, the transmission of information online has been characterized by ready availability. Because the Web is a forum conducive to innovation, and because tools exist in every browser to copy text and images, day-to-day use has loosened the underpinnings of conventional information distribution. Outright copying of information is not the only reason. For non-professional websites, creative attribution is sometimes thorough, sometimes nonexistent—a cross between responding to peer pressure and appealing to an implicit code of honor. On top of everything else, of course, what is visible online is visible to unknown millions who are equally welcome to greet what they find with praise, disdain, mimicry, or indifference.

While many artists, writers, and thinkers welcome the Web's inherent fluidity, others find it a destabilizing force, threatening the strength of original work, undermining privacy, and opening the door to unapproved usage. This is a sticking point for some Indigenous peoples who recognize that certain images and information are already subject to a form of sharing beyond their control (Battiste & Youngblood Henderson, 2000).

Canadian copyright online

Electronic communications and commerce have likewise introduced complications to the scope and enforcement of copyright.

As in other nations, Canada's government has come under pressure to strengthen copyright owners' rights (Murray & Trosow, 2007, p. 4). Following two phases of amendments to the *Copyright Act*, concluding in 1998, the law was again

put under scrutiny in order to gauge its applicability in digital contexts (Industry Canada, 2004, p. 1). In 2004, a report was issued by the Standing Committee on Canadian Heritage that outlined recommended reforms to the *Copyright Act*, including making Internet service providers responsible for taking down content reported to infringe copyright (Industry Canada, 2004, p. 11).

Introduced in 2005, Bill C-60 was expected to address some of the concerns raised by the 2004 report. However, political events disturbed this plan. When Stephen Harper's minority government took over in 2006, the bill died (Murray & Trosow, 2007, p. 4). Since then, a number of forums for discussion on copyright reform have sprung up across Canada. A growing number of Canadian reformists are taking a stand against legislation that mirrors the rigidity of the *Digital Millennium Copyright Act*, which was passed in the U.S. in 1998. Reflecting the inventive collaboration of Internet communities, some alternatives to traditional copyright are meeting with success. The Creative Commons phenomenon is one such experiment.

Most discussions of digital copyright pay little, if any, attention to Aboriginal concerns. This may be due to the fact that Indigenous groups in Canada are well-documented as having a lower quality of life than the general population (Statistics Canada, 2008). With less income, lower literacy, greater unemployment, and inconsistent access to technology (Statistics Canada, 2008), Aboriginal peoples might seem unlikely participants in this debate. However, as we shall see, Indigenous interests in copyright exceed normal boundaries in a number of ways.

Preservation of heritage

At the beginning of this presentation, I talked about how Indigenous knowledge is often tied to understanding within a holistic context. Given the power of Indigenous knowledge, its use is not taken lightly.

In his doctoral dissertation, Greg Young-Ing defines customary law as “[t]he ancient legal sys-

tems developed by Indigenous nations to regulate Indigenous societies” (Young-Ing, 2006, p. 1). Young-Ing describes some of the ways customary law regulates these elements:

- “Certain plant harvesting, songs, dances, stories and dramatic performances can only be performed [. . .] by certain individuals, families or clan members in certain settings and/or certain seasons and/or for certain Indigenous internal cultural reasons;
- Crests, motifs, designs and symbols, and herbal and medicinal techniques are owned by certain individuals, families or clan members; [. . .]
- Art forms and techniques, and herbal and medicinal techniques, can not be practiced, and/or certain motifs can not be used, until the emerging trainee has apprenticed under a master of the technique” (Young-Ing, 2006, p. 32).

Although rules already exist to govern the appropriate use of Indigenous ecological knowledge, ceremonies, and art forms, it is another matter entirely to expect non-Indigenous peoples to cohere to these values. This is not a new phenomenon, particularly as regards Indigenous land claims. Legal scholar Richard Overstall points out that “[i]n both treaty agreements and lower court decisions on [title] consultation, the Canadian legal system has made a concerted effort to push Aboriginal people away from their own governance structures and toward Western models” (Overstall, 2004, p. 197).

When cultural misappropriation occurs, Aboriginal people are often forced to look to Western law for remedy. The nearest fit is often intellectual property.

Snuneymuxw petroglyph (Publicly viewable through the CIPO at: <http://tinyurl.com/4n8kzj/>)

What you’re looking at now is a screen shot from the online trademark database of the Canadian Intellectual Property Office. The figure depicted is a facsimile of a petroglyph design belonging to the Snuneymuxw First Nation (CIPO, 2008).

Snuneymuxw lands exist mainly in the vicinity of Vancouver Island (Brown, 2003, p. 84); and as I’m sure many of you know, this area is a popular tourist destination. For years, reproductions of petroglyphs like this one, on Gabriola Island, were sold to tourists by local shops, with no money going to the Snuneymuxw for this use (Brown, 2003, p. 84).

To the native community, these petroglyphs are considered sacred, endowed with a religious power so great that it can harm those who use it inappropriately. As a result, the Snuneymuxw moved to restrict all outside use of these petroglyphs through the framework of Canadian intellectual property (Brown, 2003, p. 84). In fact, the only reason we’re looking at this image now is that public inspection is a condition of registering for official-mark status (CIPO, 2008).

Here we can see that seeking protection also meant some level of disclosure. But, as anthropologist Michael F. Brown has observed, the kind of compromise that was made might go deeper. Holding a trademark gives the Snuneymuxw the right to sue anyone who uses the petroglyphs without permission. However, it also sets a regional precedent of privatizing for non-economic purposes (Brown, 2003, p. 85). When heritage becomes intellectual property, the government becomes a cultural regulator.

What *is* culture, anyway?

Part of the reason it seems strange to mix culture and governmental control is that “culture” is a nebulous concept, not easily defined, let alone regulated. Common understanding of the term usually mixes several anthropological definitions, with loose distinctions based on groups that share the same essential values and ways of life (University of Manitoba, 2008). Traditionally, anthropologists view cultural identity as something that is learned from participation in the social life of a group (University of Manitoba, 2008). Culture is thus shorthand for a kind of belonging, which is transmitted from generation to generation in the form of stories, actions, and symbols.

Applying any word too generally can reduce its meaning. In the context of indigeneity, this problem can arise when using the words “culture” and “heritage” to refer to a variety of peoples and interests. Michael F. Brown has noted that this has “the paradoxical effect of flattening difference” between Aboriginal peoples, who have long fought for recognition as distinct communities (Brown, 2003, p. 218).

As a simple catch-all, “culture” tends not to reflect the reality of human history. From migrations to wars to global economies, cultural boundaries have long been upset by the exchange of ideas, information, beliefs, and even genes. In her Ph.D. thesis, Australian scholar Jane Elizabeth Anderson observes that the ambiguousness of the term “culture” not only complicates the idea of ownership, but throws into doubt what is meant by “cultural appropriation” (Anderson, 2003, p. 19). Taking and giving are not mutually exclusive.

In the digital environment, open exchange is more than a capability of the medium—it’s fast becoming its own social philosophy. In the name of free expression and equal opportunity, musicians share public samples, bloggers lift Web images for use on their own sites, and open source gurus question the very principles behind proprietary software. Increasingly, open exchange is also an expectation held by democratic, multi-cultural societies, since our ability to reside in close proximity with other communities depends on our efforts toward mutual understanding.

Persisting imbalances

To bring these disparate views together, we have to acknowledge that power imbalances of the past carry over to the present. We already see this evidenced in “digital divides,” and without exposure to digital resources, Indigenous people will continue to lose social capital, perpetuating power imbalances that already exist (Brown, 2003, p. 236). But how are these circumstances overcome? The answer may be in acting on is-

ues of cultural concern, forming new uses of existing tools and new understandings of existing problems.

Copyright is perceived as a tool that has potential in this respect. But making sense of copyright’s main stipulations puts Indigenous peoples in an awkward position. In several fundamental ways, Canadian copyright is incommensurate with Indigenous knowledge. For instance:

- Copyright protects “original” works (Department of Justice, 2008, s. 5[1]). Originality is conceptually tied to the idea of identifiable contributors, and can be hard to prove in a context where traditional use of knowledge spans many years and many practitioners.
- Copyright depends on the existence of a “fixed” object (CIPO, 2008). Indigenous knowledge does not always meet this requirement, as songs and stories are often held only in the minds of their practitioners (Battiste & Youngblood Henderson, 2000, p. 48).

Copyright also stipulates a limited duration before a work becomes part of the public domain. When the work’s last living contributor dies, copyright generally lasts 50 years thereafter (Department of Justice, 2008, s. 6). Under these circumstances, centuries-old knowledge is left unprotected.

Other problems exist. Battiste and Youngblood Henderson observe that Indigenous people view knowledge as something that can be lent but not owned (Battiste & Youngblood Henderson, 2003, p. 67, p. 71). If copyright is used for the sake of convenience and not applicability, it runs the risk of inadvertently commodifying heritage (Brown, 2003). Further, it detracts from the potential influence of customary law, which has untapped potential in guiding our use of cultural materials (Young-Ing, 2006). On the other hand, some Indigenous peoples see potential in amending copyright law specifically to reflect their concerns. This kind of piecemeal reform may serve the more immediate needs of Aborigi-

nal artists seeking creative ownership rights (Shand, 2000, p. 14).

Looking to the future

Conflicts over Indigenous cultural ownership are probably best mitigated by continued dialogue, along with greater societal involvement of Indigenous peoples. In order to make decisions about the use of their knowledge online, Aboriginal peoples must be allowed more opportunities to work with digital technologies. Understanding the nature of online environments can spark not only discussion on copyright reform, but also the innovation necessary to plan for the changing future of the Web.

As a final note, I urge you to think about the meaning of collecting. Are there circumstances where artifacts are better off in use than in preservation? What does it mean to preserve a history, or a culture? Libraries have obligations to many different communities, and those who work in them know that compromise is required every day. Collaboration is critical to successful compromise, and we should strive for it even when it becomes uncomfortable. While we cannot always achieve equitable solutions, we can work to understand the different perspectives that make these issues matter.

Sources

Anderson, J. E. (2003). *The production of Indigenous knowledge in intellectual property law*. Doctoral dissertation, University of New South Wales School of Law, Australia. Retrieved March 3, 2008, from Australian Digital Theses Program, <http://tinyurl.com/yrehntn>

Battiste, M. & Youngblood Henderson, J. [S.] (2000). *Protecting Indigenous knowledge and heritage: A global challenge*. Saskatoon, SK: Purich Publishing Ltd.

Brown, M. F. (2003). *Who owns native culture?* Cambridge, MA: Harvard University Press.

Canadian Intellectual Property Office. (2008). *A guide to copyrights*. Retrieved March 3, 2008, from <http://tinyurl.com/nacx3>

Canadian Intellectual Property Office. (2008). *Canadian Trade-marks Database: Petroglyph Design*. Retrieved May 8, 2008, from <http://tinyurl.com/4n8kzj/>

Canadian Press/Leger Marketing. (2002, September). *How Canadians view Aboriginal rights*. Retrieved March 13, 2008, from <http://tinyurl.com/5j66kx>

Creative Commons Canada. (2008). Retrieved March 1, 2008, from <http://creativecommons.ca/>

Daes, E. I. (1997). *Protection of the heritage of Indigenous people*. New York: United Nations.

Department of Justice Canada. (2008). *Copyright Act (R. S., 1985, c. C-42)*. Retrieved March 3, 2008, from <http://laws.justice.gc.ca/en/C-42/>

Hall, T., & Fenelon, J. (2008). Indigenous movements and globalization: What is different? What is the same? *Globalizations*, 5(1), 1-11. Retrieved May 7, 2008, from <http://www.informaworld.com/>

Indian and Northern Affairs Canada. (2001, April). *Summit of the Americas: A vision for connecting Aboriginal Canadians* [CD-ROM].

Industry Canada and Canadian Heritage. (2004, May). Interim report on copyright reform. *Report of the*

standing committee on Canadian heritage.

McMahon, K. (Director). (2004). *Stolen Spirits of Haida Gwaii* [motion picture]. Toronto: Primitive Entertainment.

Murray, L. J., & Trosow, S. E. (2007). *Canadian copyright: A citizen's guide*. Toronto: Between the Lines.

Overstall, R. (2004). Reconciliation devices: Using the trust as an interface between Aboriginal and state legal orders. In C. Bell & D. Kahane (Eds.), *Intercultural dispute resolution in Aboriginal contexts* (pp. 196-212). Vancouver: UBC Press.

Shand, P. (2000, February). Can copyright be reconciled with First Nations' interests in visual arts? Conference paper for *Protecting Knowledge: Traditional Resource Rights in the New Millennium*. Vancouver, BC: Union of British Columbia Indian Chiefs. Retrieved March 12, 2008, from <http://www.ubcic.bc.ca/Resources/conferences/PK.htm>

Skidegate Repatriation & Cultural Committee. (2007). Retrieved May 6, 2008, from <http://www.repatriation.ca/>

Statistics Canada. (2008). *Aboriginal peoples*. Retrieved March 13, 2008, from <http://tinyurl.com/2uasy8>

University of Manitoba Anthropology. (2008). *The Culture Concept*. Retrieved May 7, 2008, from <http://www.umanitoba.ca/faculties/arts/anthropology/courses/122/module1/culture.html>

Young-Ing, G. (2006, October). *Intellectual property rights, legislated protection, sui generis models and ethical access in the transformation of Indigenous traditional knowledge*. Doctoral dissertation, The University of British Columbia School of Education, Canada.

Links for Further Reading

Aboriginal Canada Portal. <http://www.aboriginalcanada.gc.ca/>

Canadian Internet Policy and Public Interest Clinic. <http://www.cippic.ca/>

Copyright Board of Canada. <http://cb-cda.gc.ca/>

A highly visible figure in Canadian copyright reform, *Michael Geist* uses his blog to track and discuss copyright's legal and social developments. <http://www.michaelgeist.ca/>

Indian and Northern Affairs Canada. <http://www.ainc-inac.gc.ca/>

Simon Fraser University recently launched a multi-year, government-supported project to document intellectual property issues as they pertain to cultural heritage. Though still rather sparse, the *Intellectual Property Issues in Cultural Heritage* website promises to be of continuing interest. <http://www.sfu.ca/IPinCulturalHeritage/>

Australian law firm *Terri Janke & Co.* is named for its principal, who is a world leader in Indigenous cultural and intellectual property rights. The firm's website features a "Hot Topics" section that summarizes relevant intellectual property developments in Australia and beyond. <http://www.terrijanke.com.au/>

With an anthropological eye, *The Long Road* blog discusses both digital technology use and intellectual property rights in Indigenous communities. Its author is Kimberly Christen, Assistant Professor at Washington State University. <http://www.kimberlychristen.com/>

The Impact of the Open Access Movement For Scholars in India

Natalie Porter

Within libraries from around the world, the “serials crisis” is a term that refers to the dramatic escalation of serials’ subscription costs, which resulted in budget cuts and restrictions upon libraries’ collections. In response, alternative publishing models such as Open Access (OA) have evolved to encourage equal access to academic research and maintain peer-reviewed standards. This digital movement freely disseminates academic material such as articles, pre-prints, post-prints, dissertations, and conference reports through online journals, or self-archiving methods such as the institutional repository (IR). According to Peter Suber, Open Access materials must be “free of charges, and free of copyright and licensing restrictions,” (2004) and as well it must be made immediately accessible, without publication delays. According to John Willinsky, the OA movement is effective within developing countries, such as India, which has a long history of intellectual pursuit and yet, even within major research libraries, very few are able to subscribe to ten percent of the high impact journals in their field (94). While some Western publishers offer discounts to institutions and academics from developing countries, the OA movement emphasizes accessibility, and India is a leading example of how knowledge can be freely shared through these means. This essay will introduce India’s academic history, review the Indian Information Technology industry, discuss institutional OA initiatives, highlight various scholarly journals, and conclude with the role of libraries throughout this process.

As a developing nation, India is very complex with a large population, issues of extreme poverty and poor health, colonial invasion, political upheaval, a cultural system based on social hierarchy and caste and yet, India has a growing Information Technology industry, and a long history of academic excellence. Hindu philosophers for hundreds of years discussed the atomic struc-

ture of matter, created astronomical maps in 3100 BC, formulated a system of numerals centuries before Europeans, and it was the Indian scientist Aryabhatta who invented the digit zero (Joshi xx). Many inventions for the computer industry have also originated in India, although were not patented or developed for commercial purposes. For example, after Sir Jagdish Chandra Bose invented wireless communication several years before Italian inventor Guglielmo Marconi (who patented wireless in 1897), he chose to allow others to expand upon his research (Joshi xxi).

Since independence in 1947, India followed a socialist economic policy within a democratic political framework, and the country adopted and maintained the English language under the colonial rule of the British (Joshi 143). India then concentrated on developing a skilled scientific industry, funded by the government. Rajiv Gandhi, who became the Prime Minister in 1984, “initiated a programme of economic liberalization aimed at making the Indian industry competitive and increasing exports” (Joshi 143). This program would move India away from depending on foreign technology.

India was motivated to develop self-sufficiency in computers and electronic largely because of national security concerns related to border conflicts with China and Pakistan. There has been some concern that India’s commitments to defense and focus on competing in global trade resulted in neglect of India’s rural areas and the “500 or so million people in India who are counted among the poorest of any population in the world” (Franda 149). And yet, statistics show that poverty has decreased since the 1980s, and the literacy rate has increased, and it is hoped that living standards and incomes will increase along with the IT industry (Dahlman 1). Unfortunately, progress is uneven across the country; for

example, richer states are increasing their incomes faster, while unemployment increases in rural areas, poverty is present throughout, and there are new challenges like HIV / AIDS (Dahlman 5).

Overall, compared to other developing nations, India's development pattern is positive and since the 1990s, India has been one of the fastest growing economies in the world (Thatchenkery 1). This is due to the information communication technology (ICT) industry and the freedom India has enjoyed from government regulation to develop this industry. The ICT strategy has revolved around the city of Bangalore, which is considered the silicon valley of India. There are over 1100 software firms working in areas such as computer chip design, systems software and communication software, and the "industry employs more than 80 000 IT professionals in the city" (Thatchenkery 152). A pool of employees trained at the diploma, undergraduate and post-graduate level coming from 294 universities and over 13,000 affiliated colleges, is a major contributor (Chakravarty 57). Throughout the country, there were approximately 130,000 trained individuals at the degree or diploma level in the year 2000. And, with such a massive workforce comes relatively cheap labor including software programmers, technicians and engineers. According to Tojo Thatchenkery, another factor is the timing of India's involvement within the IT industry, considering that there was a shortage in skilled programmers in the USA during the 1980s, just as India was beginning to establish itself as a key contributor (73). And, combined with the English language skills of Indian computer programmers, there have been many opportunities to pursue, including acting as an outsourcing venue for developed countries.

It is evident that India offers one of the largest higher education systems in the world, and with this emphasis on education, it is not a surprise that every year there are 8,000 to 10,000 PhDs awarded (Vijayakumar 2). With all this valuable research being produced, there has been a real drive towards electronically archiving the resulting dissertations. To begin this process, the Uni-

versity Grant Commission (UGC) has modernized University Campuses with campus wide networks and set up its own nationwide communication network named UGC-Infonet (Vijayakumar 1-2). UGC has also entered into alliances with publishers for adapting a consortia-based approach for e-subscription of journals (Chakravarty 57). These e-subscriptions will function as a tool to distribute educational material and journals to remote areas, creating better access to research literature for distance students and scholars.

During this modernization process, the Indian National Science Academy (INSA) established an open-access initiative called Vidyaniidhi, which means "treasure of knowledge" in Sanskrit, to digitize and host theses and dissertations, as well as their four journals (Rajashekar 155). This initiative is part of a global project operating from the University of Mysore, and is inspiring other institutions to do the same through workshops and consultations with colleagues across India. The Indian Institute of Technology and the Indian Institute of Science have utilized ePrints, which utilizes open-source software, has a registry and supports metadata for browsing and searching. As a result, the *Journal of the Indian Institute of Science* is available back to its first issues from 1914, and is gaining international acclaim. These repositories contain research papers, "preprints and postprints, technical reports, unpublished findings, and journal articles of the faculty" (Rajashekar 155). Depositing is not permitted from contributors outside the campus, but access for everyone is allowed from anywhere on the Internet. Other Indian institutions have initiated repositories on experimental basis, available only through Intranet within their campus, but there is a strong movement towards promoting Open Access led by several OA activists, including Leslie Chan, Barbara Kirsop, Subbian Arunachalam, Stevan Harnad, Alma Swan and the late T.B. Rajashekar, towards promoting Open Access (Fernandez).

Another key development was with the Indian Academy of Sciences, established in 1934, which is one of three science academies in India. Their

eleven science journals are now freely accessible on the web, including its archival issues. Rajashekar explained that, “The managing editor of these journals noted that offering these journals on the Web has increased subscriptions to the print journals from foreign countries, because more researchers and libraries outside India are learning about them” (155). It should be recognized that while OA provides researchers of developing countries access to Western research, the reverse is also true and in regards to India, the quality of information being produced is of high standard and can be of significant value, particularly in the Science, Technology and Medicine (STM) disciplines. As S.B. Ghosh explains, “The open access movement will bring qualitative research output from the research communities in India, as research literature is being accessed and evaluated worldwide” (15).

This wealth of scientific knowledge in India inspired the “Science Journal Publishing in India” project, which was based out of the National Centre for Science Information at the Indian Institute of Science in Bangalore, India and sponsored by a grant from the International Development Research Centre (Abraham). The project was carried out from October 2004 until March 2007, and was partnered by the Public Knowledge Project (PKP), headed by John Willinsky. Originally, a large number of journals in India were only in print, and the journals that were online did not adhere to publishing standards (Abraham 2). One of the purposes of the Project “was to highlight the need for structure metadata standards...[and] to make Indian scholarly content more visible in electronic media” (Abraham 1). By incorporating the Open Archives Initiative – Protocol for Metadata Harvesting (OAI – PMH), the journals were made searchable, dramatically improving access to Indian research.

In the first phase, the group set up a prototype indexing and management systems for a sample of Indian journals, using the Public Knowledge Project’s Open Journal System (OJS), and the PKP Harvester for metadata. *Current Science Online* was customized as a prototype, and six issues

were entered and uploaded. This example was demonstrated to the other journal editors, and the project leaders obtained feedback, such as additional features, and workshops were then organized to train participants on how to install and use the software (Abraham 4). It was also an ideal platform to bring together a group of people who dealt with journal publishing in India, to share their ideas and concerns. The next step was to enable URLs that were search engine-friendly for the journals, and to create a mailing list and website with more information and tools as back-up support (Abraham 4). Initially, finding reviewers with the right specializations and assigning papers for review seemed like a challenge. *Current Science* has 1000 reviewers in its database, and one of the solutions was for the authors to suggest potential reviewers, along with their contact information (Abraham 4). It was discovered that when one of the print journals went online, a paper that they had previously published was plagiarized, and the conclusion was that “going online will make authors and publishers more aware of intellectual property rights and enhance the overall quality of scholarly journals” (Abraham 5). The final outcome was that thirteen Indian Academy of Sciences journals began incorporating Open Journal Systems, as well a Hindi interface to support local language content. Several of the journals, such as the *Journal of Tropical Agriculture* filled a gap within their unique research discipline, with local researchers providing knowledge to scholars from abroad. A second phase in the project has resulted in ten more additional journals becoming Open Access.

Open Access publishing in India is now being recognized as a solution to address the problem of low visibility of research produced by Indian scientists, and the limited access they have had to international journals. Scholarly journals in the developing world are not huge economic enterprises, compared with traditional Western publishing industries, which has allowed for significant flexibility regarding alternative online options for publication. OA is recognized for its ability to connect with a broader audience and raise the profile of Indian research, which is rea-

son enough for many scholars to pursue this outlet and hopefully improve Indian citation counts (Arunachalam 2007, 2). According to Subbiah Arunachalam:

At present, research originating in an Indian laboratory and published in expensive journals all too often goes unnoticed, even by other researchers in India. Creating institutional archives of such work would help to integrate it into the global knowledge base, to reduce the isolation of our scientists and to improve opportunities for funding and international collaboration (2004).

OA publishing can also be developed beyond the institutional setting, and in India there are many noncommercial research and development institutions, both academic and research laboratories, and government science agencies, which cover research in industry, defense, agriculture, medicine, ecology, the environment, information technology, space, energy, and ocean development (Rajashekar 154). Many of these organizations publish science journals, and several projects have been conducted to encourage online publication (since they were often only in print) and to make them open access. These journals have been using “government grants and subscriptions to their print version to cover publishing costs,” (Arunachalam 2004) so that authors do not have to pay to publish their papers unlike most journals in Western countries.

There have been two significant Open Access projects within the Indian biomedical field, which are gaining recognition among the international community of scholars. The Indian Medlars Centre of the National Informatics Centre (NIC), New Delhi, currently has 38 Indian biomedical OA journals in full-text through their website medIND (Fernandez). As well, there is a bibliographic database called IndMed, that has over 75 peer-reviewed Indian medical journals. The e-journals, database and e-print archive are promoted through listservs and talks at local and international forums, highlighting the added features such as MeSH classification and RSS

feeds (Fernandez). IndMed and PubMed, the U.S. National Institutes of Health’s free digital archive of biomedical and life sciences literature, can be searched simultaneously as a meta-search on this site. By collaborating efforts, researchers regardless of origin are expanding their knowledge and range of perspective.

A similar project through Medknow Publications, a small company based in Mumbai, has helped 42 medical journals make the transition from print to electronic open access and all have seen improvements in terms of citation and accessibility (Arunachalam 2007, 11). Medknow e-journals are promoted through local workshops, through Bioline International, a not-for-profit electronic publishing service for developing countries, and through advertising its services on its website and in the print version of the journal (Arunachalam 2004). Medknow “also contacts Google to promote new journal releases” (Fernandez) and Journalserver.org, an online library of academic journals, to gain greater visibility.

The progress of Medknow and Medlars is well-received within the Indian academic community, particularly since Indian academic libraries, like Western libraries, face the problem of shrinking or static budgets coinciding with a rise in journal subscription prices and databases (Chakravarty 57). “Although university budget allocations in India during [the late 1990s] certainly fluctuated, with years of increase as well as decline, the reductions in general funding to Indian universities were nowhere near as drastic as the unrelenting price increases that, combined with currency fluctuations, forced the cutting of journal titles” (Willinsky 99). As previously mentioned, the UGC-INFONET consortium is attempting to address these issues by providing better access to traditional scholarly resources. And, Indian libraries are networking through an inter-university agency called INFLIBNET to maintain an online catalogue of Ph.D. theses produced in India, quite similar to the Vidyanidhi project (Fernandez). Because there is a culture of sharing among librarians and scholars, both INFLIBNET and Vidyanidhi are collaborating, and as Peter

Suber noted, this has led to a “cross-archive search engine for the country’s OA repositories” (2007) within the last year. Collaboration is obviously the key to developing accessibility, especially between libraries and government agencies, and in India there is now a Digital Library of India Initiative, supported by the Ministry of Communication and Information Technology (Das 1). This is a government effort aimed at preserving and providing digital access to cultural heritage resources in India like rare books and manuscripts, as well as dissertations and theses (Das 1).

It is important for librarians to become involved with institutional repositories by encouraging academics to contribute and become peer reviewers to ensure a standard of quality, so that Open Access can continue “to be replicated and adapted in an organized manner across India” (Rajashekar 156). In regards to a subject-specific repository for the library and information professionals, there is a *Librarian’s Digital Library* (LDL) through the Documentation Research and Training Centre (DRTC) in Bangalore (Ghosh 6). This library repository promotes self-archiving of library and information science research by library scholars and professionals. Rajashekar concluded that of all institutions to be supporting the Open Access movement, it is the library which is best suited considering librarians’ content management expertise and their leadership in supporting researchers’ publishing activities (156).

Open Access journals and repositories are a means to bridging a gap in regarding access to scholarly knowledge and advancement, which have been experienced by developing and underdeveloped countries. In the case of India, where some urban areas like Bangalore has seen major progress and technological advancement compared to other extremely impoverished rural areas, it is important “to ensure that all parts of the country get the access to e-resources irrespective of their geographic location in it” (Chakravarty 57). Through OA initiatives, this goal is becoming a reality for Indian students, scholars and researchers across the country. In Peter Suber’s

overview of Open Access in 2007, he writes that India now has a National Knowledge Commission that has “recommended an OA mandate first through its Working Group on Libraries, then again through its Working Group on Open Access and Open Educational Resources, and yet again in a letter from its chairman to the Indian Prime Minister” (2007). The National Knowledge Commission, a three-year project established in 2005, is focused on access to knowledge and knowledge creation to give India an intellectual edge, and there is a strong commitment to Open Access, and Open Courseware as an educational resource (Pitroda 36).

Obviously, the Open Access movement is not a passing phase, but has long-term value for the academic community. The number of Open Access journals in India has increased, with 100 to 110 OA journals being counted in 2007, and encompass a wide spectrum of subjects (Arunachalam 2007, 11). “Many of these journals are peer reviewed and indexed and abstracted in premier indexing and abstracting periodicals” (Ghosh 8). As well, there are estimated to be 25 repositories in India, such as the Raman Research Institute which has made all the papers written by C.V. Raman, the winner of the 1930 Nobel Prize for Physics, freely available online (Arunachalam 2007, 13). As this wealth of information, past and present, is made more visible at both a national and global level, it is hoped that through international collaboration India’s economy will improve overall.

Works Cited

- Abraham, Thomas and Minj, Suvarsha (2007). "Scientific journal publishing in India: Promoting electronic publishing of scholarly journals in India." *First Monday* 12(10).
<http://eprints.rclis.org/archive/00012092/> (Accessed Feb. 2008).
- Arunachalam, Subbiah (2007). "Open Access in India: Hopes and Frustrations." 19 Sept.
<http://eprints.rclis.org/archive/00012242/01/arunachalam.pdf> (Accessed Mar. 2008).
- Arunachalam, Subbiah (2004). "India's march towards Open Access." *SciDev.Net*.
<http://www.scidev.net/Opinions/index.cfm?fuseaction=readOpinions&itemid=243&language=1> (Accessed Feb. 2008).
- Chakravarty, Rupak and Singh, Sukhwinder (2005). "E-resources for Indian Universities: New initiatives." *SRELS Journal of Information Management* 42(1): pp. 57-73.
<http://eprints.rclis.org/archive/00007142/> (Accessed Feb.2008).
- Dahlman, Carl and Anuja Utz (2005). *India and the Knowledge Economy: Leveraging Strengths and Opportunities*. Washington DC: World Bank Institute.
- Das, Anup Kumar and Sen, B. K. and Dutta, Chaitali (2005). "Digitization of scholarly materials in India for distance and open learners." In Garg, S. C., Eds. *Proceedings ICDE International Conference on Open and Distance Education*, New Delhi (India).
<http://eprints.rclis.org/archive/00005577/> (Accessed Feb. 2008).
- Fernandez, Leila. (2006). "Open Access initiatives in India: An evaluation." *Partnership: The Canadian Journal of Library and Information Practice and Research*. 1 (1).
<http://journal.lib.uoguelph.ca/index.php/perj/article/view/110> (Accessed Feb. 2008).
- Franda, Marcus (2002). *China and India Online*. New York: Rowman & Littlefield Publishers.
- Ghosh, S. B. and Das, Anup Kumar (2006) "Open access and institutional repositories – a developing country perspective: a case study of India." In *Proceedings IFLA Council and General Conference (72nd : 2006 : Seoul)*, Seoul (Korea). <http://eprints.rclis.org/archive/00006391/> (Accessed Mar. 2008).
- Joshi, Akshay (2001). *Information Age and India*. New Delhi: Hardev Printers.
- Pitroda, Sam and Bhargava, P.M. and Mehta, Pratap Bhanu and Bêteille, André and Ganguly, Ashok and Ghosh, Jayati and Nayyar, Deepak and Nilekani, Nandan (2006) "National Knowledge Commission of India: An overview." In *Proceedings Launching of the National Knowledge Commission*, New Delhi (India). <http://eprints.rclis.org/archive/00006090/> (Accessed Feb. 2008).
- Rajashekar, T.B. (2006) "Open-Access initiatives in India." *National Centre for Science Information, India*. <http://eprints.iisc.emet.in/archive/00002502/> (Accessed Feb. 2008).
- Suber, Peter (2008). "Open Access in 2007." *Journal of Electronic Publishing* 11 (1).
<http://quod.lib.umich.edu/cgi/t/text/text-idx?c=jep;cc=jep;q1=India;rgn=main;view=text;idno=3336451.0011.110> (Accessed Mar. 2008).
- Suber, Peter (2004). "Open Access Overview." Blog entry: June 21.

<<http://www.earlham.edu/~peters/fos/overview.htm> > (Accessed Mar. 2008).

Thacthenkery, Tojo and Roger R. Stough (2005). *Information Communication Technology and Economic Development: Learning from the Indian Experience*. Cheltenham, UK: Edward Elgar Publishing.

Vijayakumar, J. K. and Murthy, T. A. V. and Khan, M. T. M. (2004). "Electronic theses and dissertations for Indian universities: A framework." In Murthy, T. A. V., Eds. *Proceedings 2nd PLANNER-2004*, pp. 65-70, Imphal (India). <http://eprints.rclis.org/archive/00005656/> (Accessed Feb. 2008).

Willinsky, John (2005). *The Access Principle*. MIT Press. <http://tinyurl.com/2stdkc> (Accessed Mar. 2008).

The Past, Present and Future of Scholarly Communication in Ornithology

Christina Struik

“Research has effectively not happened until it has been communicated.”

Karla L. Hahn, Director of the Office of Scholarly Communication at the Association for Research Libraries (ARL)

Introduction

Scholarly communication (SC) in the sciences has evolved since its inception. When Henry Oldenburg first introduced the scientific journal *The Philosophical Transactions of the Society of London* (Phil Trans) in 1665, SC as a concept was to document original contributions to knowledge and make them a public good (Guédon 2001). Scientific knowledge has advanced along with new research and dissemination methods, aided by technological advances. SC now refers to more than simply the final research products: published academic journal articles. SC can currently be defined by the entire research process: project initiation, communication between peers and within scientific circles, preparation and discussion of research results, and production of the final and formal research record (Thorin 2006). The types of methods used in SC have also grown since the first printing of the Phil Trans. Digital technology has affected all components of SC, from the informal preparatory work and discussion to the formal article publication.

Ornithologists, scientists who study birds, have been swept up in the evolution of SC and have begun to use many of the advanced communication tools available for the gathering and sharing of ornithological information. As the state of the global environment gains media attention in the North American society, ornithological as well as other ecological studies can help us learn about environmental quality and what we can do to keep Earth, and by extension humanity, healthy.

Librarians and other information professionals have been working with ornithologists in various ways. At university, government, and special libraries, there are often subject-specialist librarians who help researchers locate information, publications, people, and tools they can use to further the knowledge in their field. Over the years, the amount of scholarly information being produced has exploded, along with the price tag attached to the journals the information is published in (Thorin 2006). SC has also changed and expanded during this time and information specialists have had to learn how to organize and keep up with the massive amounts of information, formal and informal, to properly serve their clients' needs. This paper looks at North American examples of changes in ornithological SC, discusses international collaborative efforts in bird studies, and considers the ways in which SC advances can be of benefit to societies worldwide, especially those that are less developed.

Ornithology: does it matter?

Global climate change, especially from global warming, is one current large-scale change widely thought to be caused by humans and it affects entire ecosystems, including birds (National Audubon Society 2007). The National Audubon Society (NAS) (2007) reports that species biodiversity on Earth is decreasing and much of this decline can be attributed to human-caused environmental changes. All species play a part in their ecosystem and reduced biodiversity has been shown to destabilize or even crash an ecosystem (David Suzuki Foundation (DSF) 2007; Tallamy 2007). While humans like to separate themselves from other animals, we are part of environmental ecosystems and we are also affected by these changes (Tallamy 2007). A compromised ecosystem is less efficient and among other problems it will produce less oxygen, less plants, fish, or animals for food, and less forest

for lumber, weather buffering and water filtration (Tallamy 2007). Further, reduced biodiversity makes our planet's species less resistant to disease and extreme events (DSF 2007). For example, our world food system is based on 30 cultivated plant species, which provide about 90% of the world's diet (DSF 2007). In a world of greatly decreased biodiversity, if one of these cultivated plant species is lost due to disease or another disaster, there may not be another variety of that species to take its place and we may possibly lose it for good.

Bird populations worldwide are in decline (Gaston, Blackburn and Goldewijk 2003), so much so that 1990 an international organization was formed in the U.S. to focus on research and conservation of all continental American bird species that require land to survive, so-called "landbirds" (What is Partners 2007). This organization, called Partners in Flight, is the result of cooperation between groups all across the Americas. Members of its group not only address biodiversity conservation issues, but also environmental toxicity issues. Birds have been found to be more susceptible to many environmental toxins than humans and they can act as an early warning sign for human populations. For example, the classic canary carried down into coal mines warned the miners, by passing out, if carbon monoxide levels were getting too high (BBC 1986). Similarly, birds can be indicators of levels of toxicity in many of our natural human environments such as levels of mercury in our soils and quality of the air we breathe in any given location (see for example Duron et al. 2008). Ornithological research is thus important work to advance our knowledge of world health and by consequence, human health, so that we can make wise decisions as we interact with our environments in everyday life.

SC tools: the rise of technology

Formal scientific SC has traditionally and narrowly referred to the process of producing and disseminating articles via publishing in peer-reviewed scientific journals (Birdsall et al. 2005). SC can also be defined in a much broader way,

one that encompasses more of the communication steps included before publication (Birdsall et al. 2005). Some of those informal communication methods include networking with colleagues, using discussion groups for gaining ideas and sharing data, circulating draft reports (preprints) for feedback, and giving informal presentations (Shearer and Birdsall 2002) which may generate discussion among peers, which in turn may lead to the initiation of a new research study. Sreekumar (2006) shows that when asked why they publish their work, 90% of scientists say that it is to communicate their results to their peers. While SC is more focused on peer-to-peer information dissemination, it can also encompass all other types of communications within and beyond research communities, in all types of formats (Birdsall et al. 2005).

Communication prior to the rise of internet technologies was primarily done with regular post mail and by telephone. Publication, which also implied printing, was done almost entirely in a paper format (Sreekumar 2006). Even with current technologies that can help speed up some intermediary steps, conventional publishing can still take about 52 weeks (Sreekumar 2006). There is more to SC than the formal method of traditional publication; informal communications take place in scientific communities between high-level researchers, students, and mediators such as librarians, before a formal publication is ever released. Today there are many more options for researchers to engage in informal communication, a way of sharing information and getting feedback in a relatively quick and potentially more useful manner than with formal communication via publications (Garvey and Griffith 1967).

Informal communications include hallway, phone, or email conversations, discussion groups that meet in person or online, and blogs. These types of communication can be very helpful for rapidly communicating with peers across the world, especially because anyone who has a computer and an internet connection can also connect with his or her peers for no additional cost. One phone call must be appropriately timed for

recipients living in different parts of the world, can be monetarily costly, and often connects only two or a few people at one time. One electronic communication, such as an email, discussion board, or blog post, can potentially reach many people at once, internationally. This can be highly convenient when researchers want to work or converse with peers, employees, employers, or students in different time zones, as the messages can often be read very soon after their creation (sometimes immediately) but will remain available for reading when the time is right for the intended audience. The message is also then still available later for reference and can have date and author metadata available, one of the prior advantages of paper communications. Electronic communications can also aid in conference situations for giving presentations to small or large groups of people, and after the live presentation is over it can soon be reviewed or viewed by others if it was recorded and posted online.

It is not only informal SC that has advanced with internet communication technologies. Formal publishing in digital open access (OA) peer-reviewed journals is gaining momentum, as can be testified by the growing number of journals listed in the Directory of Open Access Journals (DOAJ)(<http://www.doaj.org/>). DOAJ contains links to over 3200 peer-reviewed journals whose entire contents can be downloaded and viewed, free of charge. OA publishing has greatly reduced the potential time lag between article submission and publication, including peer-review. The OA publishing process takes about 3-4 weeks, as opposed to the documented 52 weeks for conventional publishing (Sreekumar 2006), and the article submitted is then available to view for anyone with a computer and an internet connection. For those who are still publishing in conventional journals, there is still often an option to personally deposit the preprint and/or post-print article in an online article repository. This helps communicate the research in a faster way, free of charge to many people, and still lets a scientist gain authority in his or her field of study.

Technology and information transfer: helping results take flight

Ornithological research is regularly conducted in order to study a species or an environmental area enough so that decisions regarding real or impending human impacts on the area can be assessed as to their level of harm. In *Developing Effective Decision Support Tools for Bird Conservation*, Alexander et al. (2008) place the emphasis on information-transfer (communication) between researchers and those who actually have the power to make the decision to implement (or not to implement) conservation strategies developed from ornithological research results. It seems that research results are not always being communicated to those who have to power to actually use the information for positive action. This points to a need for open scholarly communications, like Oldenburg had in mind when he started Phil Trans; get the information to those who need it and can actually put it to use for the greater good of the public. The rise of technology seems to have enabled greater potential for communication, especially between scientists, but not as much between scientists and action implementers. The loop must be closed so that people with authority to act on environmental decisions act in an informed way, receive feedback from the results of their decisions, and bring this data back to the original researchers to improve future studies. Bridging that communication gap and closing the feedback loop is important for the advancement of ornithology and environmental sciences, and ultimately, for the advancement of citizens involved in human-environment interactions. Just as Shearer and Birdsall (2002, 1) wrote, “the creation, dissemination, and application of new knowledge are fundamental to the advancement of research, the development of an informed citizenry and a healthy national economy.”

There are many ways in which ornithologists are embracing informal communication tools. Bird Studies Canada (<http://www.bsc-eoc.org/>) has a regular newsletter posted on their web site (<http://www.bsc-eoc.org/organization/bscnews.html>) and sent out via email list serve,

which informs anyone who chooses to subscribe about Canadian government, university and other organizational projects and research as they are initiated, in session, and culminated. This form of communication includes articles about who got awards for what and links to web sites and reports if applicable. This is one way for Canadian researchers to keep up with their peers' work across the country and for anyone else interested in the subject to keep informed about Canadian ornithology research as well. Bird Studies Canada reports show national and international cooperation on bird projects and they are part of a larger global partnership: BirdLife International (<http://www.birdlife.org>), which has its own news and project reports discussed online. Partners in Flight, the continental American partnership of organizations studying land birds and their habitats for conservation purposes, makes another contribution to international partnerships between ornithologists. These partnerships are important for global trend discovery, especially for migratory birds whose needs and habitats must be studied in multiple places: summer breeding grounds, winter feeding grounds, migration routes, and migration stop-over sites (Harrington et al. 2002). Collaboration is normally essential to complex and specialized scientific research (Hara et al. 2003) and ornithological research is no exception. When information from these types of studies is combined, a more complete and accurate picture of the state of bird populations can be created, international trends can be identified, and the most and least beneficial environments can be assessed. In this way, hopefully the people with authority to either conserve, develop, or change various environments across the globe will have access to the most current and accurate data upon which to base their decisions.

The online revolution: a little slower than most?

Ornithologists have been reported as being slower to pick up on the use of online technology for SC. By 1993, many scientific disciplines in the U.S. had already incorporated widespread use of email in their communications, mostly at a rate of 50% of researchers involved in the disci-

pline (Walsh and Roselle 1999). Only 15% of ornithologists, however, had adopted email at the time (Walsh and Roselle 1999). More recently, Harvard University has adopted a policy requiring its arts and sciences faculty members to make their scholarly articles OA (Suber 2008). This policy was only put in place after it was approved by Harvard faculty (Suber 2008). However, consensus for support of OA is lacking among the researchers in the U.S.; as can be discovered in the archives of the University of Illinois at Urbana-Champaign Library SC OA blog, in 2006, ornithologists were among the few listed scholarly groups against the Federal Research Public Access Act (Kaufman 2006). This act was proposed in order to get large government research agencies to make sure the results of their research is freely available within six months of publication and the act is still under consideration (Federal Research Public Access Act 2007).

It might seem like ornithologists have been slow to warm up to the use of online technology in SC and to openly available scholarly literature online. The nature of bird studies may have something to do with this observation. Not all bird studies produce textual data (think of research about bird song and territory or nest mapping studies) and this can contribute to a lesser overall use of early online technology to communicate scholarly results (Walsh and Roselle 1999). Ornithology is also a subject in which older literature is also still quite relevant, and it is said to have a slower pace of discovery than some other scientific disciplines (Walsh and Roselle 1999). Bird studies also quite often occur in remote or uninhabited areas, which generally do not have (or have very limited) internet access and field notes are usually written by hand. Communication of any sort is more difficult in these field situations. This is quite different from studies occurring in scientific laboratories, in which daily internet access can quite often be taken as a given. However, not all avian studies are remote or even conducted outdoors and SC has advanced considerably within the discipline along with the advancements in internet technologies, the rise of digital publication, and the growth in OA publication.

SC and libraries: support is of the essence

Librarians have typically played a substantive role in the support of ornithological research and SC. Scientists need to understand what research is being done in their field of study and keep up to date with that knowledge as they proceed with their own research. Research libraries act as intermediaries to provide access to scholarly journals, texts, and other multimedia as required by their clients, the scientists (Sreekumar 2006). Librarians respond to requests from scientists as to which journals and other items are required and highly desired at any given point in time, and this can change over time as the focus of the researchers changes. Information requests are sent to librarians from what is quite often a large client base and librarians can help in regularly perusing the literature for relevant articles within the specific study area for any of their clients. This helps researchers make a more thorough literature review and can free up some of their time for primary research. Librarians at different institutions tend to be good at connecting with each other (Bundy 2003, p. 9) and they can use these connections to help their researchers connect with not only more information on their topic of interest but also with more people who may be good contacts for researchers at their own institution. In this way, libraries and their staff are frequently quite important to ornithological researchers, supporting both formal and informal types of SC.

In addition to acting as collectors and disseminators, libraries act as preservers of information. That can be especially valuable to research organizations such as government departments, university faculty departments, and companies, for-profit or not, because members benefit from their peers' research. It is thus useful to have a collection of the products of an organization's research for future reference. Sometimes scientists do not even have a personal copy of a document they published or their own copy (print or digital) may be lost, damaged, or unreadable. The library that makes sure to collect and preserve the publications of its scientists provides a

dependable source of information that can also act as an institutional memory (Allard 2005). In the world of conventional publishing, scientists relinquish copyright of their work to the publisher as well (Sreekumar 2006). If for some reason an institution does not have a subscription to the periodical in which the item was published, the only record of an author's SC resides in the institution's archive of published works, in the form of publisher article reprints and/or entries in a digital institutional repository.

Librarians in the current digital age also tend to be computer-savvy, as computer technology skills have become necessary for their jobs (Davenport 2007). They often have extensive digital collections and do much of their reference, item circulation, loans, and other communication work by computer and internet connections. Further support for researchers can be offered by way of training in catalogue and database searching when they are doing their own literature reviews at their personal desktops. Ornithologists are often immersed in their primary research and do not have a lot of extra time to learn the intricacies of using new online databases and other digital tools, and librarians can offer their services in these areas as well.

Unfortunately, research libraries are not always able to provide their scientists with all of the material they need within the budget they have to work with. This has been exacerbated by the serials crisis, the rapid rise in commercially published serial prices that has made many journal series unaffordable to libraries (Shearer and Birdsall 2002; Guédon 2001). Fortunately, the traditional roles in SC are changing; scientists remain authors, but libraries are moving from being solely information collectors and distributors to being publishers as well (Rosenblum 2007; Colenbrander, Morrison, and Waller 2005). Further, the role of libraries in providing SC resources has expanded well beyond print and multimedia to include digital collections and digital preservation (Allard 2005; Shearer and Birdsall 2002).

The advent of digital documents and online journals has translated into much greater efficiency

in distribution of scholarly work to many different places in as little time as possible (Guédon 2001). With OA publishing and archiving on the rise, SC may have the chance to truly become a more open process, with many more people benefiting from the outcomes of new knowledge than before. In the area of ornithology, the possibility is wonderful, especially for naturalists who are contributing to massive data collection projects, such as Christmas bird counts and breeding bird atlas surveys, which provide raw data for ornithologists in many different projects.

Ornithological SC in action: a few examples

There are a few OA journals in ornithology listed in the DOAJ, mostly published by the combined efforts of multiple research groups: *Avian Conservation and Ecology*, from Canada, *Boletín SAO*, from Colombia, *HUITZIL : Journal of Mexican Ornithology*, *Marine Ornithology* from South Africa, *Ornitología Colombiana*, and *Raptors Conservation*, from Russia. This is a start that could use expansion, though ornithological research can also be published in many other subjects not specifically about birds, such as environmental conservation and environmental toxicology. There are also nine prominent ornithological journals that are not entirely OA but have a significant portion of their back issue articles available for free online, some running back to the 1800s. These are part of a project known as SORA, the Searchable Ornithological Research Archive (<http://elibrary.unm.edu/sora>), which is the result of a collaborative effort between five North American bird associations and the University of New Mexico libraries and IT department. This has been wonderful for bird research communities and exemplifies the newer role of libraries in digitization and preservation of collections highly used in SC.

Avian studies require information in text but are also often dependent on researchers and field/lab assistants being able to recognize the sounds, looks, and behaviours of certain birds and being able to readily distinguish between different species. A number of studies are actually based entirely on song or on tracking down some evi-

dence that a rare (or suspected to be extinct) bird exists or is breeding in a specific area. Cornell University Libraries has a branch called the McCauley Library (<http://www.birds.cornell.edu/macaulaylibrary/>) that is devoted to wildlife multimedia sounds and images. Many of the digital files are actually openly available to anyone with an internet connection to explore online, via their library homepage.

It is not only in more formal collections that ornithological SC has advanced. Informal SC, that which takes place before actual refereed publication, has exploded in the world of avian studies. Data collection is very important and it is important that it be taken in a fairly consistent way in each study so that the results can be compared and even combined in order to produce a better picture of large-scale trends. Leading the way in open and collaborative SC, Cornell University Lab of Ornithology, along with many sponsors and affiliations, including Bird Studies Canada, created, updates, and hosts eBird (<http://ebird.org/>), the North American international joint database of bird observations. Observations are made by anyone, can go back as far as that person has data (easily uploaded with the provided data importing tools) and the resulting plethora of bird data can be viewed by anyone for free. There are even tools with which to create charts and manipulate the data so that you have the information you need for any given project. It can generate information such as when the first migratory birds arrived at a particular refuelling point or at the summer breeding grounds. It can help identify trends over time in numbers of specific species or total number of species (biodiversity) in an area. The SC project is conducted in real-time so it provides up-to-date data. It cannot provide peer-reviewed SC but the point of this project is to provide the raw data to anyone who needs it, and it benefits avian researchers in many areas, including environmental assessment, academic faculty, land management, and conservation biology. Bird Studies Canada is major player in the Canadian version of eBird (<http://ebird.org/content/canada/>) and a South American version is currently in the testing stage.

Looking to the future: opportunities abound

As pointed out by Sreekumar in his 2006 presentation *Open Access Initiatives and the Role of Librarians*, researchers would appreciate the higher impact of their articles in the world, people who are paying for research with tax dollars or with funding support would generally appreciate being able to access the results of the research they funded, and libraries would appreciate lower or non-existent scholarly journal access prices so that they can include the research publications in their collections. With OA, the serials crisis can potentially be resolved or at least stabilized. Librarians then have a role in helping their scientists learn about the benefits of OA, about including publishing funds in their research proposals, and about how to go about finding an appropriate publisher who will actually make the article OA, even if other articles in their publication are closed access.

Institutional repositories are also gaining popularity and are being implemented much more than in the past (Allard 2005). Librarians play a key role in implementation and upkeep of these repositories, as well as in training and encouragement for ornithologists so that they will actually contribute their completed works to the repositories. Again, librarians can help scientists in

teaching them how to self-archive in the institutional repository as well as any other subject repository that they feel will be useful in order to reach more of their peers. This is a time in which massive amounts of scholarly information are created and need to be communicated. It is almost impossible for any scientist to keep abreast of it all on his or her own. Who better than library science professionals to efficiently help connect researchers with their desired resources, with each other, with other organizations, and with the public?

There is hope that SC in ornithology will become truly open, so that results of bird studies are communicated not only to peers but to decision-makers as well. It can mean more accurate and informed decisions being made on behalf of citizens regarding the state of their environment. A healthy environment contributes to a healthy human population and openness in avian SC can also lead to a more informed human population. Members of this population will then be able to make their own educated opinions and influence the decision-makers, basing their arguments on well-supported, up-to-date, and authoritative scholarly information. The role of librarians and other information professionals is to be the connectors.

References

Alexander, J.D., T. Will, G.R. Geupel, and J.L. Stephens. (2008). "Developing effective decision support tools for bird conservation." *Fourth International Partners in Flight Conference: Tundra to Tropics, Connecting Birds, Habitats and People. Abstracts. 13-16 February, 2008, McAllen Convention Centre, McAllen, Texas*, 1.

Allard, Suzie. (2005). "The librarian's role in institutional repositories: A content analysis of the literature." *Reference Services Review* 33(3): 325-336.

BBC. (30 December, 1986). "1986: Coal mine canaries made redundant." *On This Day*. BBC News. http://news.bbc.co.uk/onthistday/hi/dates/stories/december/30/newsid_2547000/2547587.stm (accessed March 6, 2008).

Birdsall, William F., Kathleen Shearer, Robert E. Babe, Jean-Claude D.R. Guédon, Deborah I. de-Bruijn, J. David Holmes, Bertrum H. MacDonald, Paul McCormick, Ben Schmidt, Gordon Wood.

(2005). *Final Report: Towards an Integrated Ecosystem: A Canadian Research Strategy*. Canadian Association of Research Libraries / Association des Bibliothèques de Recherche du Canada. http://www.carl-abrc.ca/projects/kdstudy/public_html/results.html (accessed February 29, 2008).

Bundy, Alan. (2003). Changing the paradigm: libraries, education and networking. Paper for the 24th annual conference of the International Association of Technological University Libraries (IATUL), June 2-5, in Ankara, Turkey. <http://www.library.unisa.edu.au/about/papers/changingparadigm.pdf> (accessed March 7, 2008).

Colenbrander, Hilde, Heather Morrison, and Andrew Waller. (2005). "Opening Access to Scholarly Research." Presented at the British Columbia Library Association Conference 2005, April 21-23, in Burnaby, British Columbia. *E-LIS*. <http://eprints.rclis.org/archive/00005367/fullmetadata.html> (accessed March 7, 2008).

Davenport, Nancy. (2007). "Digital libraries and librarians of the 21st century." *Journal of Library Administration* 46(1): 89-97.

David Suzuki Foundation. (2007). *Why Biodiversity is Important*. <http://www.davidsuzuki.org/Forests/Biodiversity/Importance.asp> (accessed Feb. 29, 2008).

Duron, M., D. Evers, D. Braun, M. Brown, C. Driscoll, R. Hames, C. Lee, J. Loukmas, K.P. McFarland, C.C. Rimmer, A. Sauer, N. Schoch and R. Taylor. (2008). "Songbirds as indicators of environmental mercury loads in the northeast." *Fourth International Partners in Flight Conference: Tundra to Tropics, Connecting Birds, Habitats and People. Abstracts. 13-16 February, 2008, McAllen Convention Centre, McAllen, Texas*, 36. Partners in Flight. http://www.partnersinflight.org/events/mcallen/PIF_McAllen_2008_Abstracts.pdf (accessed February 29, 2008).

Federal Research Public Access Act. (2007). Washington, D.C.: SPARC – Scholarly Publishing and Academic Research Coalition. <http://www.arl.org/sparc/advocacy/frpaa/index.html> (accessed March 1, 2008).

Garvey, William D., and Belver C. Griffith. (1967). "Scientific communication as a social system." *Science*, New Series 157(3792): 1011-1016.

Gaston, Kevin J., Tim M. Blackburn, and Kees Klein Goldewijk. (2003). "Habitat conversion and global avian biodiversity loss." *Proceedings of the Royal Society of London B* 270: 1293-1300.

Guédon, Jean-Claude. (2001). *In Oldenburg's Long Shadow: Librarians, Research Scientists, Publishers, and the Control of Scientific Publishing*. Washington, DC: Association of Research Libraries. Available from <http://www.arl.org/resources/pubs/mmproceedings/138guedon.shtml>

Hara, Noriko, Paul Solomon, Seung-Lye Kim, and Diane H. Sonenwald. (2003). "An emerging view of scientific collaboration: scientists' perspectives on collaboration and factors that impact collaboration." *Journal of the American Society for Information Science and Technology* 54(10): 952-965.

Harrington, Brian A., Stephen C. Brown, James Corven, and Jonathan Bart. (2002). "Collaborative approaches to the evolution of migration and the development of science-based conservation in shorebirds." *Auk* 119(4): 914-921.

Kaufman, P. (June 15, 2006). "Not everyone embraces open access." *Issues in Scholarly Communication: Open Access Archives*. University of Illinois at Urbana-Champaign. http://www.library.uiuc.edu/blog/scholcomm/archives/open_access/ (accessed February 20, 2008).

National Audubon Society. (November 29, 2007). "More than one-quarter of US bird species imperiled, report states." *ScienceDaily*. <http://www.sciencedaily.com/releases/2007/11/071129083858.htm> (accessed Feb 25, 2008).

Rosenblum, Brian. (2007). "Building publishing services in the academic library." Presented at CALC 2007, Colorado Academic Library Summit: Changing Cultures: Collaboration, Social Networking, and New Technologies, May 31-June 1, in Denver, Colorado. *E-LIS*. <http://eprints.rclis.org/archive/00010877/> (accessed March 7, 2008).

Shearer, Kathleen, and Bill Birdsall. (2002). "The transition of scholarly communications in Canada." *Transition of Scholarly Communication in Canada: Background Documents*. Canadian Association of Research Libraries / Association des Bibliothèques de Recherche du Canada. http://www.carl-abrc.ca/projects/kdstudy/public_html/background.html (accessed March 1, 2008).

Sreekumar, M.G. (2006). "Open access initiatives and the role of librarians." Presented at the *INDEST-AICTE Workshop and Fourth Annual Meet, Indian Institute of Technology, Delhi, December 19-20, 2006*. <http://indest.iitd.ac.in/workshop/2006/sreekumar.pdf> (accessed February 19, 2008).

Suber, Peter. (February 12, 2008). "Text of the Harvard policy". *Open Access News: News from the Open Access Movement*. <http://www.earlham.edu/~peters/fos/2008/02/text-of-harvard-policy.html> (accessed March 1, 2008).

Tallamy, Douglas W. (2007). *Bringing Nature Home*. Portland, Oregon: Timber Press.

Thorin, Suzanne E. (2006). "Global changes in scholarly communication." In *eLearning and Digital Publishing*, ed. H.S. Ching, P.W.T. Poon, and C. McNaught, 221-240. Dordrecht, Netherlands: Springer.

Walsh, John P., and Ann Roselle. (1999). "Computer networks and the virtual college." *Science, Technology Industry Review*. 24: 49-78.

"What is Partners in Flight (PIF)?" (2007). *Partners in Flight – U.S.* <http://www.partnersinflight.org/description.cfm> (accessed February 26, 2008).

Google Scholar: An Outcast in the Library World

Mê-Linh Lê

Google Scholar¹ has been met with a range of reactions in the academic and library communities since it was introduced in beta mode in 2004. Students and researchers flocked to the site, taking comfort in its familiarity and easy-to-use search box. Librarians, on the other hand, were more cautious in their approach. They were concerned not only with the secretive nature of Scholar, but with the idea that library users would begin and end their information searches with Scholar, unaware and uninterested in the wealth of information that they might be missing. In the years since then, the literature has been filled with studies on Scholar; many of them are content analyses that compare Scholar's results with a host of other search tools. After a brief introduction of Scholar, this paper will highlight a number of these content comparisons, including cases where it appears that researchers seem prejudiced against Scholar and its services. It is believed that by examining these content comparisons, it will be possible to detect a pattern in Scholar's subject strengths and weaknesses. Ultimately, this paper aims to show that Google Scholar is an undervalued search tool that has found acceptance in nearly all scholarly communities except for the library.

Beginnings and Basics

Launched on November 18, 2004 by search engine behemoth Google, Scholar and its effect have become an oft-discussed topic in the library community. The driving force behind Scholar was Anurag Acharya, a computer scientist who was part of the academic world before joining Google in 2000. According to Acharya, he started the project simply because he wanted to "build something better for researchers" (Butler, 2004, p. 423). Taking inspiration from a quote by Isaac Newton, "If I have seen further, it is by standing on the shoulders of giants", Scholar's mission is to provide a simple means to search for scholarly

literature. Through its interface, users can "... search across many disciplines and sources: peer-reviewed papers, theses, books, abstracts and articles, from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations." (Google Scholar, 2008).

In addition to the clean and easy-to-use interface inherited from its parent, Google, Scholar also makes use of its search algorithms. While Google considers the number of webpages that link to a page when determining rank, Scholar analyzes the network of citations that occur between publications. If an article is cited numerous times by a large number of authors, it will have a higher page ranking (Pomerantz, 2006). Although outside the scope of this paper, it should be noted that Scholar's citation counts are not without their own controversy (see Jacsó, 2006). One of the major shortcomings of Scholar that does not appear to be mentioned by researchers in the field is a potential problem with its page ranking. As discussed above, papers that are cited often are ranked higher during searches.

What sets Scholar apart from Google is where it searches, even though there is some haziness over what and how much is being indexed by Scholar. In 2004, Scholar announced that nearly all 'major publishers' had allowed the full-text of their databases to be searched, and Butler (2004) estimated that half a billion pages were being searched (Butler, 2004). Scholar has never made public the list of sites it searches but, in general, it is known that major databases, university presses, scholarly organizations, and government agencies allow Scholar to crawl its pages. Examples include IEEE, ACM, Nature, Macmillan, Wiley, PubMed, HighWire Press, Ingenta, National Institute of Health, and CiteBase. Although early studies mentioned that Elsevier remained one of the notable holdouts that did not allow

Scholar to crawl its site (Butler, 2004; Giustini & Barsky, 2005), recent searches of Scholar suggest that this has since changed. In essence, Scholar is accessing the so-called 'Deep Web' of participating organizations to obtain many of its records (Gardener & Eng, 2005). The rest of its records come from a search of freely accessible online material and from reference lists. Scholar uniquely extracts citations from reference lists of documents found through the web and deep web, and create separate search results for them. These records exist as citations only, they contain no abstracts or links; they do however, fulfill the important role of letting users know of their existence.

Once a user has searched Scholar, there are two ways for the literature in the search results to be accessed: 1) if the user belongs to an institution that has a subscription to the database or journal where the full text of an article is stored, the user can immediately access the article by completing an authentication process; or 2) if the user is unaffiliated with an institution that has access to the record, they are able to pay to view the document on a "pay-per-view" basis (Pomerantz, 2006). It is worth noting that the first option is only possible if the university or institution has made its resources available via a link resolver.

Content Comparison

One of the first content comparisons was done by Callicott & Vaughn (2005) who compared Scholar to subscription databases and a university library catalogue. The authors conducted searches of five sample undergraduate level research topics (all of which fell into humanities or social science); in each search tool the first 100 results were analyzed for type (books, articles, etc.) and relevance. While recognizing that relevance is subjective, the authors found that Scholar performed quite favourably when compared to other databases (which included Academic Search Premier and a subject-specific database). Callicott & Vaughn write that Scholar's "results in the humanities were surprisingly solid, relevant and full of full-text links" (p. 83).

The Callicott & Vaughn article, however, reflects some of the biases against Scholar. In their introduction, the authors describe Scholar using a negative tone:

A collection of Web files that look like scholarly journal articles with a smattering of scholarly support such as conference and technical reports, theses, and the like. Using special, secret algorithms, Google culls out items from their general database that fit their mold of a scholarly article. These pages are then dumped into a new, more specialized database—Google Scholar (p. 72).

An examination of the authors' word choices, such as 'smattering of scholarly support', 'special secret algorithms', 'fit their mold', and 'dumped' indicate the authors are likely prejudiced against the service, perhaps stemming from the fact that Scholar is unwilling to reveal their algorithm or the databases they index. In one instance, Callicott & Vaughn write that "Google Scholar generated a rather paltry six percent relevancy rate in terms of citations for Martha Stewart and female entrepreneurs." (p. 81). In the very next sentence however, the authors concede that the other databases also generated few relevant results. It seems Scholar is being held to higher standards than the other databases, which makes little sense when one considers that Scholar is offering its services for free, while the other databases are charging fees. It is only grudgingly that Callicott & Vaughn accept the fact that Scholar performed well in their study, although they still believe that it will always "cater to the lowest common denominator and discourage thorough research" (p. 86).

Slightly less critical was another early comparison done by Wlekinski (2005), who performed a cursory search on Ithiel de Sola Pool, and found the results to be mixed. As she states: "Is this scholarship? Hardly. Could I have written a credible research paper from the information Google Scholar returned? Of course not. Did it lead me to other sources? Definitely. Most importantly, it gave me a good first-start overview on the sub-

ject. It's a helpful beginning." (p. 24). Once again, although Scholar is returning relevant results, the author decides that it is not meeting certain standards.

Wleklinski's findings also seem to echo the belief that Scholar is not strong in the area of humanities and social sciences (Jascó, 2005; Kesselman & Watstein, 2005). Comparisons that focus on the sciences have proven much more successful. Jones (2005) did a single search comparison in the biological literature comparing Scholar and eight other databases with the dominant biological database, BIOSIS. Scholar returned records for 56% of the 39 documents indexed in BIOSIS since 1996, which was much higher than the other databases. In addition, Scholar provided 69 articles that were not even indexed in BIOSIS. Although purported to be strong in the sciences, other content studies conducted in this field have ultimately concluded that Scholar serves better as a supplementary tool to more traditional resources, particularly for clinicians who require the most current material available (Giustini & Barsky, 2005; Henderson, 2005).

Gardener & Eng (2005) compared Scholar to three fee-based information retrieval systems: ERIC, PsycInfo, and ISI Social Sciences Index. Using the search topic "home-schooling", the authors found that Scholar returned significantly more results, and those results came from a wider variety of sources, and with a high degree of relevance. One major issue was currency. Although unproven, it appears that some publishers may enforce a moving-wall embargo on their material, only allowing Scholar to crawl the most recent pages after a certain amount of time has past (Drewry, 2007). In addition, Scholar's citation-based article ranking algorithm means that older, more established articles that are well-cited are more likely to be near the top, as opposed to articles more recently published.

Neuhaus, Neuhaus, Asher & Wrede (2007) conducted a comprehensive comparison between Scholar and 47 other databases (21 were free Internet resources; 26 were proprietary databases) in an attempt to better understand what

Scholar indexes. Each of the 47 databases was assigned to a category (e.g., Business, Science & Medicine, Humanities). In the study, a random list of 50 article titles was generated from each of the databases, and then each title was searched in Scholar to see if it was included. Although Wilson (2007) draws attention to the fact that Neuhaus *et al.* offer no information on how the 47 databases were chosen, or the fact that some subject areas are poorly represented (15 Science & Medicine databases and 1 Business database), the study still presents some interesting findings. Notably, the content covered by Scholar varies widely based on database and discipline. Of the 47 databases examined, Scholar coverage ranged from 6% to 100%, and was much stronger in the sciences. As well, a strong preference for English language documents was noted, in addition to a bias towards more recently published material.

In another recent study, Walters (2007) evaluated the content of Scholar and seven other databases (Academic Search Elite, AgeLit, ArticleFirst, GEOBASE, POPLINE, Social Sciences Abstracts, and Social Citation Index) in the area of later-life migration. Using a method dissimilar from previous studies, Walter preassembled a list of 155 'core' articles on the topic, and then searched for each of these articles in each of the databases. It was found that of the eight databases, Scholar provided the most comprehensive citation coverage. It also provided abstracts for 67% of the core articles found.

Finally, as shown by the selection of studies above, the majority of Scholar research compares Scholar with either free or fee-based databases. Scholar, however, shares many more similarities with federated search tools such as MetaLib, which provide a single access point for searching academic literature. In their study, Haya, Nygren & Widmark (2007) compared students' experiences searching for their thesis research using Scholar and MetaLib. Scholar outperformed MetaLib on all measures, was easier to use, found twice as many records, and found more documents that were peer-reviewed.

Discussion

As shown by the selection of content comparisons here, Scholar performs well in comparison to humanities and social sciences databases (Callicott & Vaughn, 2005; Gardner & Eng, 2005; Walters, 2007); in comparison with a variety of free and fee-based databases (Neuhaus et al., 2007); in looking up citations on political scientists (Wleklinski, 2005); in searching out biological records (Jones, 2005); and in comparison with similar search tools such as MetaLib (Haya et al., 2007). Although it did not perform as well in the medical sciences (Giustini & Barksy, 2005; Henderson, 2005), more studies are needed to test whether Scholar has improved since its early days in 2005.

Ultimately, however, these studies show that Scholar performs well in nearly all areas in which it is tested. And yet, the bulk of these studies also caution that Scholar is not quite 'there yet'. Authors cite numerous problems with Scholar, such as its citation count problems (Jasco, 2006), its English-language bias (Neuhaus et al., 2007), and its poor coverage in certain areas (Callicott & Vaughn, 2007).

Libraries, in spite of the positive research and high usage, still remain wary of Scholar. Mullen and Hartman's 2006 study showed that of 113 academic libraries, only 24% included Scholar in its alphabetical list of databases, and only 5% included it in their list of public access catalogues. A recent study meanwhile looked at 948 universities and colleges to determine the usage and promotion of Google and Scholar within their websites (Jascó, 2008). It was found that 73% of the research institutions used Scholar's link resolvers, but only 5% promoted Scholar as a research tool on the library homepage. It is as if libraries accept that researchers use Scholar (hence the link resolver) but they are not yet comfortable directing users to the site directly from the library home page.

What is it exactly that libraries don't like about Scholar? A recent review article of Scholar by Jascó (2008), while pointing out that Scholar is

strong in many areas, finds numerous faults with Scholar and its inner workings, particularly in areas of advanced searching and limiting functions. For example, the number of returned documents can often be misleading or outright wrong. While not discounting these concerns, it must be argued that Scholar is still in beta (although Jascó (2005) questions whether this is a ploy on Scholar's part to avoid criticism). The problems with advanced searching and limiting features, while obviously a concern for librarians, do not appear to matter to most users. A blog posting by Plymouth State University librarian Casey Bisson notes that only 0.0067% (less than a hundredth of a percent) of the searches on their OPAC get limited to specific languages, locations, dates, or material types (2005). The many search features and limiters are not what the majority of users are interested in.

As to the suggestion that Scholar panders to the lowest common searching denominator and leads users to believe that Scholar has everything, these fears seem unfounded. Experienced researchers know that using only one source is inadequate. Just as they would not rely on Academic Search Premier to find every article ever written on a topic, it seems unlikely that they will rely on Scholar to do this either. As for beginner researchers, who are perhaps just searching for a handful of articles on a subject, what is the difference between searching Scholar and searching JStor to retrieve those articles? Scholar is what the searchers make of it; the library's job should be to ensure that patrons recognize what Scholar is capable of, and what it isn't. This is similar to how users are taught about any proprietary database to which a library has access.

It seems as if those in the library world want everything from Scholar. Not only do they want it to provide unparalleled search abilities free of charge, but they believe Scholar should also provide the secrets to their success. This in no way means that research on Scholar should not be done; it no doubt helps to fix problems. My concerns are the negative attitudes towards Scholar and how that plays into whether libraries support, promote, and teach Scholar. Rather than

trying to ignore or belittle what Scholar is doing, academic libraries must make use of Scholar's strengths. For example, Wlekinski (2005) and Donlan & Cooke (2005) recognize that Scholar is excellent at driving students and faculty towards the library catalog and database. Or, as Tenopir (2005) noted, "It does not replace the library collection. It expands access." One easy option is for libraries to display Scholar more prominently on their websites, along with a disclaimer that discusses Scholar's strengths and weaknesses.²

The library literature is awash these days in figuring out how libraries can stay relevant in this 2.0 world. The first step is accepting that library users are not seeking perfection, but simplicity – which is what Scholar offers. By promoting and

working with such tools, libraries are acknowledging that they recognize what users want and need from the library system.

Notes

1. For the rest of this paper, Google Scholar will be referred to simply as Scholar. Despite the very best effort of Callicott and Vaughn (2005), the term 'Schoogle' never quite caught on.
2. This could be similar to what is done by the University of British Columbia Library and their display of MetaLib (<http://www.library.ubc.ca/>)

Works Cited

Bisson, Casey (2005). "The High Cost of Metasearch for Libraries." *MaisonBisson.com*. Accessed July 5, 2008 at <http://maisonbisson.com/blog/post/10665>

Butler, D. (2004). "Science Searches Shift Up a Gear as Google Starts Scholar Engine." *Nature*, 432, 423.

Donlan, R. & Cooke, R. (2005). "Running With the Devil: Accessing Library-Licenses Full-Text Holdings Through Google Scholar." *Internet Reference Services Quarterly*, 10, 149-157.

Callicott, B. & Vaughn, D. (2005). "Google Scholar vs. Library Scholar: Testing the Performance of "Schoogle"." *Internet Reference Services Quarterly*, 10, 71-88.

Drewry, J.M. (2007). *Google Scholar, Windows Live Academic Search, and Beyond: A Study of New Tools and Changing Habits in ARL Libraries*. Unpublished Master's Thesis, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Gardener, S. & Eng, S. (2005). "Gaga Over Google: Scholar in the Social Sciences." *Library Hi Tech News*, 8, 42-5.

"Google Censors Itself for China" (2006, January 25). *BBC News*. Retrieved April 8, 2008 from <http://news.bbc.co.uk/2/hi/technology/4645596.stm>

Google Scholar (2008). *About Google Scholar*. Retrieved April 8, 2008 from <http://scholar.google.com/intl/en/scholar/about.html>

Giustini D, & Barsky E. (2005). "A Look at Google Scholar, PubMed and Scirus: Comparisons and Recommendations." *Journal of Canadian Health Libraries Association*, 26, 85-89.

- Haya, G., Nygren, E. & Widmark, W. (2007). "Metalib and Google Scholar: A User Study." *Online Information Review*, 31, 365-375.
- Henderson, J. (2005). "Google Scholar: A Source for Clinicians?" *Canadian Medical Association Journal*, 172. Retrieved April 9, 2008 from <http://www.cmaj.ca/cgi/content/full/172/12/1549>
- Jascó, P. (2005). "Google Scholar: The Pros and Cons." *Online Information Review*, 29, 208-214.
- Jascó, P. (2006). "Deflated, Inflated and Phantom Citation Counts." *Online Information Review*, 30, 297-309.
- Jascó, P. (2008). "Savvy Searching: Google Scholar Revisited." *Online Information Review*, 32, 102-114.
- Jones, D.Y. (2005). "Biology Article Retrieval from Various Databases: Making Good Choices with Limited Resources." *Issues in Science and Technology Librarianship*, 44. Retrieved April 8, 2008 from <http://www.istl.org/05-fall/refereed.html>
- Kesselman, M. & Watstein, S.B. (2005). "Scholar and Libraries: Point/Counterpoint." *Reference Services Review*, 33, 380-387.
- Mullen, L. B., & Hartman, K. A. (2006). "Google Scholar and the Library Web Site: The Early Response by ARL Libraries." *College and Research Libraries*, 67, 106-122.
- Neuhaus, C. Neuhaus, E., Asher, A. & Wrede, C. (2006). The Depth and Breadth of Google Scholar: An Empirical Study. *Libraries and the Academy*, 6, 127-141.
- Pomerantz, J. (2006). Google Scholar and 100% Availability of Information. *Information Technology and Libraries*, 25, 52-56.
- Tenopir, C. (2005). Google in the Academic Library. *Library Journal*. Retrieved April 9, 2008 from <http://www.libraryjournal.com/article/CA498868.html?display=Online%20DbsNews&industry>
- Wilson, V. (2007). "A Content Analysis of Google Scholar: Coverage Varies by Discipline and by Database." *Evidence Based Library and Information Practice*, 2, 134-136.
- Walters, W. H. (2007). "Google Scholar Coverage of a Multidisciplinary Field." *Information Processing and Management*, 43, 1121-1132.
- Wleklinski, J. M. (2005). "Studying Google Scholar: Wall to Wall Coverage?" *Online*, 29, 22-26.

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THAT information professionals who work with specialized clientele or in specialized settings are a valuable and vital part of the larger library and information management community in Canada

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