Library Resources & Technical Services

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ERRATUM NOTICE: *LRTS* 52, no. 2 was erroneously foliated to begin with page number 1. This title page reflects the corrected foliation for that issue. Our apologies to our authors and readers for this mistake.

Library Resources & Technical Services

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Editorial

Peggy Johnson

I have been reflecting, over the last few months, on the changes in how I conduct research and write. When I wrote my masters thesis for the University of Chicago Graduate Library School (R.I.P.), I used the trusty note card system to record my findings, being careful to write the source on each card and the page number if I was quoting from it. I used printed indexes and the card catalog to find sources, and knew by heart the Joseph Regenstein Library stacks that that held the library science materials. The worst part of the process was assembling the information into a coherent whole. I typed, retyped, and retyped some more, and literally cut and taped it together. I gave up when I was finally at the point of typing the final error-free manuscript and hired someone to do it. He had to use carbon paper to create two copies.

Twenty years later, when I researched and wrote the thesis for my second masters, I had a computer. Photocopiers were ubiquitous and I made good use of them. I had access to indexes on CD-ROM and, though they were not necessarily retrospective, searching them was so much easier than dragging heavy bound volumes over to a table and noting possible sources on a piece of paper. Because I used a computer, turning the thesis into my first book was not too difficult.

Forward fifteen years and I am working on another book. Writing is still a painful process (though so much easier with electronic cut and paste), but researching is truly a pleasure—and a seductive one, at that. My library has access to an extensive collection of indexes and journals online, with link resolvers and other features that make moving from the citations to the articles extremely easy. I use Google Scholar to locate articles that cite my initial sources and to follow paths to more sources. Online journals with live links to the sources cited in articles take me further down the rabbit hole. The challenge for me is to stop following the paths that lead me to more and more sources and to shift my focus to assembling my notes and thoughts into a lucid whole. I have used and appreciated the advances in information access over the years, of course, but writing my current book really brought home how researching and writing have changed.

As a journal editor, I am benefiting from the ease with which I can verify citations and check URLs in the papers submitted to *LRTS*. I also check to see if submitting authors have lifted prose from other authors or their own previously published works. A simple two- or three-sentence search reveals plagiarism in ways not possible just a few years ago. Being able to edit drafts created with word processing software simplifies the revision process for authors and for me. And it is getting better—soon *LRTS* will implement an automated, online manuscript system, streamlining the submission and peer-review process for authors, reviewers, and me. We will let you know as soon as the new system is active.

Cataloging and Classification

Review of the Literature 2005–06

By Magda A. El-Sherbini

This paper reviews library literature on cataloging and classification published in 2005–06. It covers pertinent literature in the following areas: the future of cataloging; Functional Requirement for Bibliographic Records (FRBR); metadata and its applications and relation to Machine-Readable Cataloging (MARC); cataloging tools and standards; authority control; and recruitment, training, and the changing role of catalogers.

The literature published in 2005 and 2006 devoted to cataloging and classification reveals a profession in transition. The future of the catalog and cataloging in the Web environment was the focus of several important discussions, presentations, white papers, reports, conferences, and articles. Another topic attracting attention was the emerging new cataloging standard, *Resource Description and Access (RDA)*. The great importance of the *Functional Requirements for Bibliographic Records (FRBR)* was emphasized in a number of scholarly publications. Classification schemas, such as the Dewey Decimal Classification (DDC) and the Library of Congress Classification (LCC), continued as a topic in library literature. Other areas of interest included metadata, Machine-Readable Cataloging (MARC) and the flexibility of Extensible Markup Language (XML), authority control, recruitment, training, and the changing role of catalogers.

Research Method

A preliminary review of literature on cataloging and classification published in 2005 and 2006 was conducted in two library online databases: Library Literature and Information Science Full Text, and Library, Information Science, and Technology Abstract with Full Text. Other resources, such as the Web-based resources Google Scholar, Google Print, and Online Computer Library Center (OCLC) WorldCat, print library journals, and book reviews in library journals related to cataloging and classification, were also consulted. These resources were searched by keywords or subject headings, or both. The search strategy was limited to journal articles and books in English, and to 2005 through 2006 dates of publication.

The search produced a great number of citations (238 items). To deal with the volume of material and the range of topics covered, the author created a spreadsheet of topics derived from the preliminary literature search and the author's knowledge of the current trends in cataloging and classification. The author organized the topics into the following groups: future of cataloging, classification, Library of Congress (LC) series decision, authority control, *FRBR*, *Anglo-American Cataloguing Rules* 2nd ed., 2001 revision *(AACR2)*, *RDA*,

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subject headings, DDC, recruitment, training, education, cataloging standards, ISBN13, and metadata.

Resulting citations were then entered under each heading in the spreadsheet. Citations under each topic were reviewed to determine if the sources of the publication were scholarly and peer reviewed. In limited cases, the author included non-peer–reviewed sources because they provided valuable and relevant information. Some topics, such as the LC decision about series and ISBN13, were not included because of insufficient scholarly literature.

The author read and analyzed the articles and wrote brief reviews for each item. Some articles fell outside the scope of this review and were excluded. The focus of this paper is on substantive contributions to the literature. In a few cases, less significant resources are referenced to provide a context for important themes covered during 2005 and 2006. Some articles may have been omitted unintentionally, for which the author apologizes.

The Future of the Catalog and Cataloging

The future of libraries in general and of cataloging in particular has been the focus of much of the research in recent years. Speculation about the directions that cataloging is taking, as well as suggestions for ways to revitalize and enhance the catalog and retool the cataloging workforce, filled the pages of many articles and reports in 2005 and 2006.

One of the more important contributions in this area was made by Calhoun, who prepared a provocative report for the LC addressing the function of the catalog.[1] She noted that students and researchers seem to bypass the library catalog in their quest for information. She provided detailed analysis of the current situation, options for revitalizing the catalog, an assessment, and action to be considered. The first chapter of the report includes background, project objective, and research methodology. Chapter 2 offers ideas about the prospects of the library catalog. The appendixes provide detailed analysis of the current situation, key findings from the literature, and structured interviews.

Not all of Calhoun's premises can be accepted at face value or easily defended. When she states that "research library online catalogs reflect a small portion of the universe of scholarly information," the reader cannot help but wonder what that means.[2] Although conventional wisdom seems to suggest that library catalogs now represent a shrinking portion of the universe of information in general, much of the information that is obtainable online cannot be classified as scholarly. Calhoun's report raised many important questions and is of great value to library planners and managers.

A report prepared by the University of California Libraries Bibliographic Services Task Force also addressed ways to improve library online catalogs to meet the needs of modern users.[3] The task force analyzed existing literature and interviewed leading practitioners in the library community to develop a set of recommendations that would radically improve the catalog. The report provided four major recommendations to enhance search and retrieval, redesign the online public access cataloging (OPAC), adapt new cataloging practices, and support continuous development. An appendix listed examples of systems and prototypes that demonstrate some of the improvements that the task force recommended.

North Carolina State University was a leader in seeking new approaches to provide catalog information to users through the implementation of the Endeca ProFind platform.[4] Antelman, Lynema, and Pace described the new functionality enabled through Endeca and the implementation process and system architecture, assessed the new catalog's performance, and considered future directions.[5] The authors provided detailed discussion of the Endeca platform and its ability to provide access to a variety of formats and concluded that the software has potential for becoming a platform for library resource discovery.

Research methods employed by students and researchers and their preference for Google as a research tool was explored in an article by Marcum.[6] She addressed the future of cataloging in the Internet era and the need for improved indexing and retrieval tools. She raised the question of whether detailed descriptive cataloging is justifiable in the era of massive digitization and in light of the costs involved in the creation of detailed catalog records. This is likely to be an issue that will be discussed in the future.

Reacting to Marcum's article, librarians from Indiana University Libraries wrote a white paper on the future of cataloging at Indiana University.[7] They provided an overview of current trends in libraries and technical services, identified possible new roles for cataloging staff, and strategies aimed at revitalizing cataloging operations at Indiana University. Their well-researched and coherently organized report adds another dimension to the discussion of the OPAC. The report points to the new Google initiative aimed at digitizing large parts of academic library book collections and the impact this initiative might have on the future of the library catalog. This seems to be the key question that future library catalog planners have to take into consideration. Limitations of the OPAC have been a persistent topic in library literature. In "My Kingdom for an OPAC," Pace discussed limitations of the current systems and highlighted activities of some companies that are taking innovative approaches with the OPAC.[8]

A series of discussions on the American Library Association TechSource blog initiated by Schneider addressed obvious limitations of the online catalog and focused on the weaknesses in OPAC searching from the user's point of view.[9] In her first posting, she focused on

the absence of relevance ranking in most online catalogs. In a subsequent posting, Schneider provided a checklist of some features that would benefit the OPAC. Among these features were ranking, stemming, field weighting, spell checking, refining original search, support for popular query operators, Boolean, flexible default query processing, in-line query limiters, duplicate detection, sort flexibility, character sets, faceting, advanced search, human suggestion, search logging and reports, and a well-rounded administrative interface. The third posting addressed the literalism of the catalog.

Numerous changes taking place in the library world in the last decade have had a profound effect on the library catalog. To address the impact of these changes on the future of bibliographic description, the LC established a working group to examine and discuss the future of bibliographic control. This working group was charged to

> present findings on how bibliographic control and other descriptive practices can effectively support management of and access to library materials in the evolving information and technology environment, recommend ways in which the library community can collectively move toward achieving this vision, and advise the Library of Congress on its role and priorities.[10]

The working group organized the issues into three broad categories: Uses and Users, Structures and Standards, and Economics and Organization. The group submitted their report in January 2008.

Although some library authors perceive the future of the catalog as radically different from its current form and question the need for the standards and rules of cataloging, Tillett pointed out that the future of the catalog is in understanding and adapting the *FRBR*.[11] Tillett began her concise study with the discussion of the history of *FRBR* and moved on to its application in cataloging. She suggested that "this model provides a new perspective on cataloging that should influence the design of future systems, cataloging codes, and cataloging practices."[12] She pointed out that libraries will continue to need codes and the new, revised *AACR2,* which will incorporate *FRBR* concepts. She described *FRBR* as a conceptual model of the bibliographic universe that is designed to meet specific user needs.

Hillmann focused her effort on the usefulness of cataloging and classification for research. She attempted to explain how these tools place information within a browsable hierarchy of subject concepts.[13] The National Library of Australia: Austrian Committee on Cataloging hosted a seminar, "Beyond the OPAC: Future Directions for Web-based Catalogues," with presentations and sessions on a variety of topics including making *RDA* the new cataloging standard;

the potential impact of RDA on OPAC displays; applying *FRBR* to library catalogs; and managing OPACs.[14]

In her article on cataloging, Davis concentrated on the factors that contributed to the success of online libraries in the United States.[15] She suggested that the "employment of experienced and professional librarians can also improve operations in online libraries. Moreover, libraries should be incorporated with the school organization to enhance academic decision making."[16] Mann discussed the limitations of Google Print and how these limitations make cataloging and classification more important to researchers.[17] He pointed out that searching the Internet using keywords does not provide scholars with the structured menus for research options that are available in the OPAC browse display. Mann observed that searching Google is not the same as doing research.

Bair provided an important contribution to the profession of cataloging and to the body of literature on the subject of cataloging in "Toward a Code of Ethics for Cataloging."[18] Her article should be read by anyone interested in the profession. Bair provided an overview of publications on this subject and concluded with a proposed set of ten commandments of cataloging. This set of ethical guideposts sets out the responsibilities of each cataloger whose job is to provide unfettered access to information.

Changes in Cataloging Units and the Role of Catalogers

The future of cataloging and catalogers remained a focal point of discussion. The very purpose of cataloging was under scrutiny, as was the question of whether catalogers will continue to have a role in the future of information organization, especially in the metadata arena. The number of practicing catalogers is predicted to drop significantly in the next few years due to aging and retirement. In 2003, Wilder reported that catalogers in Association of Research Libraries (ARL) member libraries constitute one of the oldest categories of an aging librarian population and predicted that one third of the catalogers working in ARL libraries in the year 2000 would retire by 2010.[19] Leysen and Boydston built on Wilder's research and conducted a survey of the heads of cataloging at the ARL libraries to determine the number of professional catalogers employed, their responsibilities, projections for demand for catalogers, and thoughts about their roles.[20] Their study revealed that the number of professional catalogers remains constant or is decreasing supported Wilder's projections for retirements. They reported that the role of catalogers in ARL libraries is changing as catalogers become more involved in management and less focused on cataloging activities. Leysen and Boydston suggested that a serious depletion in the ranks of catalogers may

pose a threat to the libraries' ability to continue to provide access to scholarly resources, and concluded by calling for a better recognition of the value of catalogers.

Boydston and Leysen continued their study of catalogers' roles in a subsequent article in which they examined the issue of catalogers creating metadata in terms of the cost, supply of catalogers, and the need for further training.[21] Constant changes in libraries have had great effect on staff morale and productivity. While some library staff could adapt to changes very easily, others found it difficult to cope. Curzon's *Managing Change: A How-to-Do-It Manual for Libraries* can prove a useful resource in this area.[22] The first part of this book, "Managing Change Successfully," provides instructions for conceptualizing the issues, planning, preparing, making decisions, controlling resistance, implementing changes, evolutions, and tips on how to succeed. Part 2 provides practical guidance for dealing with technology's impact on libraries, applying the latest research in change management, and developing new strategies for coping with changes.

Functional Requirements for Bibliographic Records

Interest in the concept of *FRBR* continued to gain momentum among librarians and researchers.[23] Numerous articles on the subject have appeared. Gonzales provided a simple description of *FRBR* and its function, and cited major projects that implemented *FRBR,* such as the Research Libraries Group's RedLightGreen and the OCLC Fiction Finder.[24] Tillett presented general background information on the development of *FRBR* from 1992 to 1995 and explained the model and its impact on cataloging rules and bibliographic structure.[25]

One of the most significant contributions to the *FRBR* literature is *Functional Requirements for Bibliographic Records (FRBR): Hype or Cure-All?,* edited by Le Boeuf.[26] This collection of eighteen articles brought together many debated issues related to *FRBR's* concepts, ideas, and practical applications. It provided an introduction to the topic and offered thorough descriptions and analyses of current *FRBR* projects. The book included a chronological section that explained how *FRBR* was developed and how it will evolve in the future; a theoretical section that reviewed how *FRBR* analyzes different types of library materials; a "Practical Aspects" section that examined how some systems actually use *FRBR*; and a final section that explained the XML Organic Bibliographic Information Schema project, an alternative to *FRBR,* which shows that other solutions are possible to meet future cataloging challenges. This book is a valuable source of information on *FRBR* and can serve as a reference tool for various information users.

Several researchers have addressed the inability of current online catalog interfaces to find and collocate all versions and variations of a title and showed how *FRBR* can solve this problem. Mimno, Crane, and Jones explored this issue and showed that some *FRBR* research focused on the creation of tools that would experiment with the model, but no research addressed the implementation of *FRBR* in the catalog.[27] In their research, they used the Perseus Digital Library catalog to explore implications of hierarchical catalog records for searching and browsing. Yee addressed the problems that users are having when searching the OPAC and how a better understanding of AACR2R/MARC 21 authority, bibliographic, and holdings records would allow for *FRBR*-izing current OPACs using existing records.[28] In her study, Yee described the difficulties with combining the search by author and title because variant name information is isolated in authority records. She also found that the catalogs cannot display the full range of relevant items that the library holds because of the problem of variations in items. Both problems, she said, could be addressed by making the catalog more aware of connections between author information and work information and between versions of the same work.

In "*FRBR:* Coming Soon to Your Library," Bowen pointed to *FRBR's* potential to improve access to library materials and reported the intention of the Joint Steering Committee for Revision of AACR, that is assisted by the work of the Format Variation Working Group, to explore ways of incorporating *FRBR* into the next edition of *AACR2*.[29] She mentioned several vendors of library systems that are already adding *FRBR*-based functionality to their systems. She emphasized that the *FRBR* concept is not totally new to the library community, and that most *FRBR* entities and attributes are already present in library catalog records. This article received the Best of *LRTS* Award for 2005.

Carlyle explored the *FRBR* conceptual models and focused in particular on group 1 entities (work, expression, manifestation, and item), which is the most difficult aspect of the *FRBR* model.[30] In her discussion, she presented definitions of the word *model* and a variety of examples of model types and functions. She described models used prior to *FRBR* and compared them to it. The author contributed an interesting point when she suggested that the most important changes that *FRBR* may bring will occur in the consciousness of catalogers and in online catalog displays.

Rapid changes, increase in electronic content, and the difficulty with managing this content in a way that the user can find, identify, select, and obtain needed information and resources, were addressed by Madison.[31] She described four emerging discovery tools: portals, digital image management systems, institutional repositories, and instructional or learning management systems. Madison emphasized

that the methodology and framework of *FRBR* are useful tools in building expanded access and content systems. She stressed the need for academic libraries to cooperate with the teaching faculty to build a new integrated platform that will access a variety of library resources.

As the volume of digital materials increases significantly, identifying and accessing these materials becomes more difficult. Weng and Mi addressed these issues in "Towards Accessibility to Digital Cultural Materials: A *FRBR*ized Approach."[32] The authors emphasized the importance of providing better access to cultural collections in digital form and expressed hope that applying *FRBR* principles in cataloging these collections will provide improved access. The National Library of Norway's Paradigma Project is one of several projects seeking to preserve its digital cultural heritage and provide researchers with full-text Internet access. Van Nuys et al. provided a description of this project and explained how the *FRBR* entity level's work, expression, manifestation, and item are used in the archive design.[33] The project systematically harvests Norwegian digital documents from the Web and archives them for present and future access.

Ercegovac reported her findings from an experiment that applied *FRBR* to a science fiction title, Edwin A. Abbott's *Flatland: A Romance of Many Dimensions*, as represented in the OCLC WorldCat.[34] The study revealed that applying the *FRBR* relationship model improved access to the item studied here and improved its accessibility in networked digital libraries. The *FRBR* concept has gone beyond bibliographic records to authority data. Patton reported on the activities of the Functional Requirements and Numbering of Authority Records (FRANAR) working group that is reviewing all the entities from group 2 and 3 to extend the model to the authority data.[35] Issues related to *FRBR* and serials were addressed in several articles. Shadle presented an overview of the model he used as the basis of entity-relationship of *FRBR* to model serial publications.[36]

Application of the *FRBR* model to continuing resources was discussed by Jones.[37] The author identified four broad areas of concern and proposed tentative solutions that could make the *FRBR* model more suitable for use with continuing resources. Application of *FRBR* has found its way into international literature. Cho presented a study on the application of *FRBR* to the online public access catalog in Korean libraries.[38] She pointed out that a set of algorithms to automatically convert a bibliographic database into *FRBR* is already available, but the Korean catalogs have difficulties with authority records. This makes automatic conversion impossible. Cho presented a method for extracting work sets from the Korean union catalog using a semiautomatic mechanism and proposed methods to allow local libraries to apply *FRBR* to their own OPAC using work sets that result from the union catalog. She proposed using the cluster work sets for the union catalog and sharing the resulting work sets with local libraries.

FRBR-related literature of the last two years is moving beyond the descriptive phase and looking at applications of the *FRBR* principles in various environments. Much of the work is centered on digital collections that exist in silos or are harvested from the Internet. Researchers are looking at special issues, such as serial collections, foreign-language collections, and others. Most researchers expressed hope about the effect *FRBR* will have on providing access to materials, and several pointed out the need to enhance displays in library catalogs.

Metadata

Metadata, though no longer new, continues to attract attention and to be a topic at library and information science conferences and in professional literature. Two publications taken together can be viewed as a comprehensive metadata reference for catalogers. The first publication, *Metadata: A Cataloger's Primer,* is a collection of articles edited by Smiraglia.[39] This volume provides a learning resource about metadata for catalog librarians and students. It first addresses the theoretical foundations of metadata structure and creation, then focuses on specific metadata schema: Dublin Core, Encoded Archival Description (EAD) and Encoded Archival Content (EAC), XML, Metadata Encoding and Transmission Standard (METS), and how a cataloger would apply them. The book includes exercises that teach catalogers how to mark up a simple document in HTML. This volume is an excellent source for catalogers who want to learn about the theory and practice of metadata. Chapters that deal with practical applications of the metadata standards provide easily understood and applied examples. The more theoretical parts of the book offer a framework that can be helpful in planning and management. The second publication, *Metadata and its Impact on Libraries*, by Intner, Weihs, and Lazinger, is an excellent text that provides guidance to both students and librarians for preparing metadata.[40] The authors provide an introductory description of metadata, an overview of some schemas, and information on creating bibliographic records as metadata for electronic monographic materials and continuing resources. They also explore metadata's effect on current developments in online reference, choice of metadata schemes, archiving and digital preservation, professional education, and future innovations. Samples of bibliographic records as metadata and exercises with answer keys for practice are included.

Several articles covered general aspects of metadata. Coyle's "Understanding Metadata and its Purpose" defined metadata and discussed XML and Resource Description

Framework.[41] The author looked at metadata for document-like objects and introduced the Dublin Core, Metadata Object Description Standard (MODS), and METS. She also discussed the meaning of metadata for library cataloging. In her conclusion, Coyle suggested that metadata is devoid of the rigorous standards that characterize cataloging and that in time it may evolve into real cataloging. Chopey presented an introduction to the purpose of metadata and how it has developed.[42] He discussed a wide variety of elements of the data delivery process from the point of view of their impact on data retrieval. He offered a set of proposals for the steps needed to plan and implement metadata strategies that would lead to effective resource discovery in a local digital repository. Beall provided a different opinion of metadata and its applications in "The Death of Metadata."[43] He expressed his concerns about the number of metadata schemes that are being created and implemented, and how sharing these standards among professional communities is becoming increasingly difficult. He emphasized that the implementation of the MARC format in libraries has been the most successful metadata implementation in history. He suggested that MARC is the established comprehensive metadata standard that has withstood the test of time and is the metadata schema of the future. The theme of enhanced metadata becoming more like traditional cataloging is echoed in Gorman's keynote address to the Canadian Metadata Forum in 2005.[44] Gorman expressed skepticism about the usefulness of existing metadata schemes and suggested that controlled vocabularies and detailed designators will have to become part of metadata to make it more effective.

Rapid growth of electronic resources over the past decade has been accompanied by much development and application of metadata schemas. Following the release of the draft *Guidance on the Structure, Content, and Application of Metadata Records for Digital Resources and Collections* in 2003 by the International Federation of Library Associations and Institutions (IFLA) Cataloguing Section Working Group on the Use of Metadata Schemas, Howarth discussed responses to the draft and outlined next steps taken by the working group.[45] Howarth reported that most of the respondents rejected the concept of the "Core of Cores" that was proposed by the IFLA group. They considered it a watered-down version of Dublin Core and redundant at best. With the reinstitution of the IFLA group, the work of developing core metadata sets will continue.

Opening Web content to automated classification using metadata in the context of library groupware or portals was the thesis of an article by Fox.[46] Fox pointed to the emerging user-developed taxonomies—known as folksonomies—and their potential usefulness when applied in conjunction with traditional controlled vocabularies. Matusiak explored the use of social classification in describing digital collections.[47] Citing examples such as Flickr, she studied the pros and cons of folksonomies. Her study revealed that user-generated metadata offered flexibility, but was too varied to provide permanent solutions to the challenges of image indexing. Along with Fox and other authors cited here, Matusiak proposed a combined use of informal social tagging with more structured controlled vocabularies. Cantara introduced Simple Knowledge Organisation System (SKOS) Core, a new encoding standard for developing semantically rich controlled vocabularies that will enhance the searching of digital content.[48] SKOS is still a work in progress but promises to offer searching flexibility for specific user communities. It offers semantic cluster searching capability that goes beyond the keyword and controlled vocabulary searches.

Metadata Applications

Many metadata schemas were created to meet specific needs or for a specific community. Several articles and reports were published in 2005 and 2006 on metadata applications. The University of Pennsylvania Library and the Taylor-Schechter Genizah Research Unit at Cambridge University Library in England started a project to digitize their joint holdings of manuscript fragments from the Cairo Genizah. Their goal was to create an online catalog and an image database for this collection. A report by Lerner and Jerchower described the project, how the staff developed preliminary guidelines for standardized descriptive metadata, and why they adopted MARC tagging.[49]

Westbrook et al. described the creation of the Union Catalog for Art Images (UCAI, a centrally managed database of art image metadata) and the ARTstor project (a centrally managed database of art images), two projects funded by the Andrew W. Mellon Foundation and underway at the University of California at San Diego.[50] The aim of UCAI is to automate processes that will facilitate interoperability in the union catalog.

Banush, Kurth, and Pajerek described Cornell University Library's largely automated method for providing title-level catalog access to electronic journals made available through aggregator packages.[51] This approach to e-journal cataloging bypasses the vendor record option in favor of the creation of a separate bibliographic record for each version of the e-journal. They used externally supplied metadata to create a brief bibliographic record. The authors cautioned that Cornell's solution may not be a universally acceptable answer for all libraries.

Abe and Greenberg analyzed resource authors' use of a metadata-creation application at the National Institute for Environmental Health Sciences.[52] They provided insight into how resource authors approach metadata software and studied how interface design can encourage interest in metadata creation among resource authors.

MARC 21 and XML

The MARC standard remains an important tool for encoding bibliographic data. The LC's Network Development and MARC Standards Office is developing a framework for working with MARC 21 data in an XML environment. This framework is intended to be flexible and extensible to allow libraries to use MARC data in ways specific to their needs. The LC Web site (www.loc.gov/standards/marcxml) on MARC 21 and XML schema provides valuable information about the MARC XML architecture; MARC XML schema and documentation, examples, tools and utilities; MARC Document Type Definition, presentations; and related XML formats.

Several conferences and workshops addressed using MARC 21 with XML. A major meeting devoted to this topic was held at the World Library and Information Congress in Oslo in 2005. Papers from the congress included a detailed report on the need for MARC/XML to support search and retrieval protocols presented by Taylor and Didcmeiss; a discussion on the principles of XML and its advantages for bibliographic data; a description of a parallel schema to XML that was developed by the Center for Computer Technologies of the Ural State University at Ekaterinburg, presented by Skvortsov, Pashkova, and Zhlobinskaya; Carvalho's presentation on the full power of XML and its use of style sheets to convert XML documents to other formats; and McCallum's report reviewing the development of an XML schema for MARC 21 and the MARC/XML tool kit of transformations.[53] McCallum cited examples of the successful implementation of MARC/XML that support the notion of MARC/XML being a tool that makes use of standards while offering flexibility necessary to deal with the demands of modern information retrieval mechanisms.

Cataloging Tools and Standards

Anglo-American Cataloguing Rules

An update of *AACR2* was published in 2005.[54] The update includes instructions for capitalization of single letters used to represent words, and for multiple-letter prefixes in compound terms; changes arising from the preparation of the new edition of *Cartographic Materials* and a checklist of changes.[55]

AACR2 continued as a topic of interest in 2005 and 2006 library literature. Bowman presented a study of the development of description in cataloging from a historical development point of view, before International Standard Bibliographic Description (ISBD).[56] She compared 150 years of Anglo-American cataloguing codes and practices for description to the ISBD. The author's findings suggest that the general order of title, edition, and publications have been stable throughout the period. Physical description has undergone many changes, especially in relation to the title page as a source of information. Bowman pointed out other problems related to the copyright date and multiple places of publications that need to be solved, and concluded that knowing what was done in the past is important to avoid making the same mistakes.

During 2005 and 2006, suggestions and proposals were introduced to revise parts of the *AACR2* to accommodate certain situations and to eliminate confusion and redundancies in the record-retrieval process. Procházka discussed a 1994 rule interpretation issued by LC that directed catalogers how to establish uniform titles for choreographic materials.[57] He explored the value of these rules, their difference from prior rules, and the origins of the concept behind the rules. Hider and Turner investigated *AACR2*'s special rules that apply to personal name headings in certain foreign languages (rules 22.21–22.28).[58] Their study discussed four of these rules that pertain to Indonesian, Malay, and Thai name records contributed to the Australian National Bibliographic Database. Hider and Turner conducted a survey and found that because of the difficulty of the rules, many of these headings were generated without consulting them. The authors recommended that these rules be dropped and that rules in this chapter be revised to be even more general. To eliminate redundant entries in bibliographic records, which will help users find resources by "heads of state (etc.)" through the authority structure of the catalog, Jin suggested that *AACR2* 21.4D1 and 21.4D3 rules be revised to allow entering only one name in the same bibliographic record.[59]

Important changes to *AACR2* have been suggested and introduced in the last few years. These changes are paving the way for the introduction of *Resource Description and Access,* which will replace the AACR.

Resource Description and Access

The first edition of *AACR2* was published in 1978, and the review process managed by the Joint Steering Committee for the Revision of AACR (JSC) has produced many updates and revisions. *AACR2* was designed for an environment dominated by the card catalog, an environment that has changed significantly over the years. The International Conference on the Principles and Future Development of AACR, held in Toronto in 1997, identified substantive problems with *AACR2*. Although the updates issued in the years following that conference addressed some of these problems, a fundamental rethinking of the code was required to respond fully to the challenges and opportunities of the digital world.

As part of its strategic plan, JSC is working toward a new edition of AACR (scheduled for publication in the spring of

2009) that will carry the name *Resource Description and Access (RDA)*. In December 2004, a draft of part 1 of *AACR3* (as it was then called) was made available to constituencies for review. At the April 2005 meeting, in response to this constituency review, the JSC and Committee of Principals decided to take a different approach to the new edition. As part of this, the decision was made to use a new working title: *RDA: Resource Description and Access*.[60]

The library community anxiously awaits the new rules, and predictions and speculations about the new codes have already begun. Medeiros initiated a discussion about the goals of *RDA* and described its potential uses by a large community of information providers.[61] The author posed important questions about the ability of *RDA* to meet its objectives, as stated by the JSC. Practical problems that are likely to arise with implementation of the *RDA* were addressed by Intner, who pointed out that the main problems with *RDA* are that its terms are not easily understood (although it is intended to simplify cataloging practice) and that catalogers may not be inclined to accept its complexities without some assurance that it can become a successful alternative to current practice.[62] Hillmann also expressed her concerns about *RDA*, particularly in the areas of transcription and specified sources of information, reliance on notes, and multiple versions.[63] Weiss and Larkin provided a context for this new standard and explained the work that has been done by the JSC.[64] They covered the rationale behind the new standard, the process for development of a first draft, reaction to that draft, and the direction of the JSC's work.

Most of what has been written about *RDA* falls into the broad categories of prediction or general information and updates. As the official release of the new code draws near, many more articles on the implementation and various aspects of the *RDA* can be expected.

Library of Congress Subject Headings

Chan's *Library of Congress Subject Headings: Principles and Application*, 4th ed., was published in 2005 and covered important changes since the previous edition.[65] This publication remains a major tool for teaching LC subject headings. The Library of Congress Cataloging Distribution Service issued two updates: *Library of Congress Subject Headings*, 29th ed. *Free-floating Subdivisions: An Alphabetical Index*, 18th ed., was issued in 2006.[66]

Library of Congress Subject Headings (LCSH) remains a standard in academic libraries, and many public and special libraries. This is reflected in substantial research that continues to be published on LCSH and other forms of subject and keyword access. Library practitioners continue to apply LSCH subject headings to their materials, but this commitment to the old standard is facing criticism because of the limitation, inflexibility, inadequate syntactic structure, currency or bias of the headings, and lack of specificity in the subject-headings list.

Many leaders in the library field have suggested that subject keyword searching can be more effective than using controlled vocabulary such as LCSH. Debate continues about the viability of replacing the controlled vocabulary (LCSH) used in the library catalog by subject keywords. Gross and Taylor conducted research on what proportion of records retrieved by keyword searching has a keyword only in a subject heading field and thus would not be retrieved if no subject headings were present.[67] The study found that if no LC subject headings were assigned to catalog records and searchers were to rely on keyword searches alone, more than one third of the records could not be retrieved. In some cases, these numbers would be even higher. Other advantages of using controlled vocabulary, such as cross-referencing and the reduction of irrelevant hits, would be lost as well.

Fischer collected and analyzed twelve years of literature on LCSH published from 1990 to 2001.[68] She pointed out that LCSH has been consistently criticized over the last six decades, and the critics insist that LCSH must become more flexible and easier to use. But the consensus is that no better or more comprehensive controlled vocabulary tool exists.

In 1971, Berman published *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People*, in which he focused on the issue of biased subject headings in LCSH.[69] Some of Berman's recommendations and proposals for change were implemented while others were rejected. Knowlton's article sums up Berman's recommendations and includes a compilation of all of his predecessor's suggestions, including the resulting changes in LCSH.[70] In addition, the author included a brief analysis of the remaining areas of bias.

Ashman took on the topic of LC subject headings and their use in the online catalog after they were changed.[71] He examined bibliographic records from academic libraries' online catalogs to determine whether old subject heading were in use after they were changed by LC. His study revealed that the old headings were regularly found in library catalogs even after the examined libraries had started to use the new replacement headings. According to the author, libraries do not check and replace superseded subject headings in all of their records.

Many studies on LSCH pointed out that the syntax of the schema is complex and requires highly skilled catalogers to assign subject headings. To make the schema easy to use and understand, the OCLC initiated the development of Faceted Application of Subject Terminology (FAST). The new schema is based on the LSCH vocabulary. Wolfe reported on the Association for Library Collections and Technical Services (ALCTS) Cataloging and Classification Section Forum held to discuss the OCLC FAST initiative.[72] ALCTS

and its sections continue to play a vital role in the ongoing discussion of the subject-headings issues. The Cataloging and Classification Section Subject Analysis Committee (SAC) "has established a subcommittee to evaluate the significance of FAST subject headings to the library community based on the users' perspective."[73] Miller, Olson, and Layne reported on the important work the Subject Analysis Committee has done on subject access and controlled vocabularies. SAC subcommittees have worked for nearly ten years on subject access indexing and display issues; their findings and recommendations were analyzed by the authors.[74]

Research on issues surrounding LCSH continues and librarians are identifying solutions to a variety of problems. Denda discussed the increasing number of interdisciplinary fields in higher education and the need to identify relationships within them.[75] The author used the example of women's studies to examine the effectiveness or ineffectiveness of LCSH in satisfying the needs of an interdisciplinary researcher. Denda concluded that libraries would do well to provide tools that would better match the user and the resources.

Anderson and Hofmann argued in favor of implementing a fully faceted syntax approach as a solution to the main problems facing LSCH.[76] The authors demonstrated how this might be accomplished and how the new syntax could be integrated with existing headings. Jin explored ways to help users efficiently access works through the OPAC when corporate bodies have changed names over time, and recommended that catalogers follow the rules outlined in *Library of Congress Subject Headings: CSH: Principles of Structure and Policies for Application* to deal with issues concerning corporate name changes.[77] Assigning subject headings to theses and dissertations can be a challenge to catalogers because they usually represent a very specific concept or subject. Hoover presented a guide for beginning catalogers with humanities or social sciences backgrounds.[78] This guide will help catalogers with assigning subject headings to theses and dissertations on the basis of LSCH.

Applying a form or genre to nonprint media has attracted attention from scholars. Ho summarized a discussion about applying form or genre headings to foreign films that occurred on two electronic discussion lists (AUTOCAT and OLAC) and described the local policy at Texas A&M University Libraries.[79] Miller reported on a workshop, Improving Access to Audio-Visual Materials by Using Genre/Form Terms, held at the 2004 Online Audio-Visual Catalogers Conference, in Montreal, Quebec.[80]

Assigning subject headings is not simple. In some cases, the day-to-day process of subject cataloging does not correspond entirely to theoretical descriptions in textbooks and international standards. Sauperl compared the practice of assigning subject headings by the Slovenian Public Library catalogers to the ones assigned by the American catalogers.[81] She addressed the issue of whether catalogers who have not

received formal training perform subject cataloging differently from their trained colleagues.

Classification Schema

Dewey Decimal Classification

DDC, the world's most widely used library classification system, received attention in several articles in 2005 and 2006. These publications analyzed various aspects of the schema. *Dewey Decimal Classification, 22nd Edition: A Study Manual and Number Building Guide* is a comprehensive guide to the 22nd edition changes by Scott.[82] This monograph includes an introductory chapter, a detailed summary of the DDC's publication history, controversial editions, and popular additions, and can serve as a useful guide for training students and classifiers.

A 2006 double issue of *Cataloging and Classification Quarterly*, edited by Mitchell and Vizine-Goetz, was devoted to DDC.[83] Papers in this special issue explored the history of DDC, its application internationally, teaching DDC, users' browsing behavior in a DDC Web service, using DDC to organize Web resources, mapping terminologies to classification system, Dewey Browser, and other topics. It is an excellent compilation of articles for general readers and scholars who are exploring current issues and new development of DDC.

Some authors also considered the use of DDC in Europe and elsewhere. Landry described the work of three national libraries (Switzerland, Germany, and Austria) to adopt and use DDC to provide access to their national bibliographies and their approach to publish the German language version of DDC in 2006.[84] Dal Porto and Marchitelli analyzed three blogs (Biblioatipici, Letture, and Marchitelli's) to demonstrate that different contents may be classified using the appropriate scheme.[85] The authors determined that DDC is also a suitable classification scheme for Web-based resources.

The question of why libraries still use Dewey was the focus of an article by Shorten, Seikel, and Ahrberg.[86] The authors explained why libraries in the 1960s and 1970s were reclassifying their collections from DDC to the LCC. They surveyed those academic libraries still using DDC and asked if reclassification is something they had considered or were considering. Some of these academic libraries reported that they would convert to LCC and that the patrons do not have any preferences over which classification systems are being used by the library.

Library of Congress Classification

In 2005 and 2006, LC updated several LCC schedules: G Geography, Maps, Anthropology, Recreation (2005); H

Social Science (2005); J Political Science (2006); K Law in general (2005); K Law Tables (2005); KF Law of the United States (2005); L Education (2005); P–PZ Tables for Language and Literature (2006); PB–PH Modern European Languages (2005); PJ–PK Oriental Philology and Literature, Indo-Iranian Philology and Literature (2005); PL–PM Languages of Eastern Asia, Africa, Oceania, Hyperborean, India, and Artificial Languages (2006); PR–PS–PZ English and American Literature, Juvenile Belles Letters (2005); PT German, Dutch, and Scandinavian Literature (2005); and Z Bibliography (2005).[87]

Taylor published the tenth edition of *Introduction to Cataloging and Classification*.[88] It incorporates revision to AACR2, enhancements to MARC 21, DDC, LCC, LCSH, and Series Subject Headings. The glossary, bibliography, and all chapters have been revised. Examples throughout the text help illustrate the rules and the concepts. This publication remains a classic resource on cataloging and classification.

To determine the level of consistency of LCC class numbers within and across American libraries, Subrahmanyam examined how they were assigned in fifty-two American library systems.[89] Her study found an unexpectedly high level of consistency, and the author provided some explanation for the inconsistencies. She concluded her article with a recommendation for libraries to use the preferred class number and an alternate class number for local library information. Subrahmanyam asserted that this approach would provide enriched subject access through local and union catalogs.

Chandler and LeBlanc described the Columbia University project aimed at using the LCC data from their catalog to provide subject access to the library's electronic resources using their newly developed Hierarchical Interface to LC Classification (HILCC).[90] They also looked at the possibility of using the Columbia HILCC scheme as developed (or in modified form) to create a virtual undergraduate print collection outside the context of the traditional online catalog. Wartzok and Hernandez explained the complexity of reclassifying official records of the United Nations in the Green Library at Florida International University.[91] The project's purpose was to unify the collection under one LC class (JZ).

Authority Control

Authority control is a challenging aspect of cataloging. Wolverton published two articles on authority control. His "Authority Control in Academic Libraries in the United States: A Survey" reported on a survey demonstrating that authority control was valued and used by most respondents.[92] Wolverton recognized the important role that authority con-

trol plays in cataloging. His decision to gather current information through the survey was prompted in part by the need to update existing scholarship and to fill the gaps in authority-control research. Wolverton's "Becoming an Authority Control: An Annotated Bibliography of Resources" appeared in 2006.[93] The publication is an annotated bibliography that includes monographs, articles and papers, electronic discussion groups, and Web sites related to professional conferences, training, and a discussion of current trends and expected future developments in authority control.[94] This bibliography is a very useful educational tool for librarians and libraries.

Description of authority control processing and measuring its successes was another topic of interest. Simpson and Williams described the University of Florida's experience with the Name Authorities Cooperative (NACO) program.[94] They reported how their institution increased its contribution to the national authority database by managing and refocusing the objectives of the program. They concluded with ten useful tips and suggestions for libraries to consider as they plan to grow their NACO contributions. Weber, Steely, and Hinchcliff described the implementation of a grant-funded authority control project in the Keystone Library Network, an eighteen-member library consortium in Pennsylvania.[95] The authors described in detail the grant process and the authority control project. Topics covered included staffing and staff training as well as database maintenance.

Another contribution to the topic of consortial authority projects was made by Larmore, who reported on a new Program for Cooperative Cataloging NACO funnel project in four academic libraries and one state library in South Dakota.[96] A funnel project is a group of libraries that have joined together to contribute authority records to the national authority file. In a funnel project, one institution serves as coordinator, and LC deals solely with this coordinator, who is then responsible for disseminating information to all the funnel participants. The desire to start the North Dakota project originated from the South Dakota State Library, where cataloging staff wanted training on authority record creation in order to create and update authority records for state agency names. The article details the process of creating a funnel project and the staff-training process.

Hickey, Toves, and O'Neill worked with the NACO authority files to study the implementations of NACO normalization rules.[97] They found numerous inconsistencies that resulted from ambiguities in the rules. After studying causes of the inconsistencies, the authors created a publicly available NACO Normalization Testbed that will assist the community in the consistent implementation of normalization rules.

Extending the FRBR concept to authorities was discussed in Patton's update on the work of the IFLA Working Group on Functional Requirements and Numbering of

Authority Records.[98] Patton provided an updated description of the entity-relationship model being developed by the working group to extend the FRBR model to cover authority data. Miller explored the use of XML Organic Bibliographic Information Schema (XOBIS), which falls somewhere between the complexities of MARC and the simplicity of the Dublin Core.[99] XOBIS is designed to reorganize bibliographic and authority data elements into a single, integrated structure.

Authority Control and Multiscripts

Library users have experienced difficulties with searching the online catalog for materials written in nonroman scripts. Catalogs with only romanized access points are not adequate for those users. The development of the Unicode Standard allowed users to search by the original script rather than the romanization. The Unicode Standard is a global character set for worldwide computing covering the major modern scripts of the world as well as the classical forms of Greek, Sanskrit, and Pali. Aliprand discussed the use of Unicode in developing library systems with multiscript capability.[100] This development would then offer the prospect of multiscript authority records. She addressed restrictions on the structure and content of a MARC 21 authority record and described alternative structures containing languages written in nonroman scripts.

Other studies addressed the issues of using the language scripts in the LC NACO authority file and enhancing authority records with nonroman scripts. In her article on the use of other scripts in LC's Name Authority File (NAF), Lerner examined the options of using Hebrew script in MARC 21 authority records, and considered the prospect for cooperative work between American and Israeli libraries.[101]

Khairy described the Bibliotheca Alexandrina methods of authority control of Arabic old names and creating a bi-script Arabic–roman file using the VTLS/VIRTUA integrated library system as a first step toward cooperative projects involving union catalogs and authority files.[102] The topic of authority control for foreign corporate authors was addressed by Jin, who conducted a study that compared forms of corporate entries in LC NAF and the Web.[103] The study showed that more than 70 percent of names in LC NAF created between 1998 and 2002 exactly matched corporate names as they appeared on the Web.

Vendor-supplied Authority Records

Authority control is a time consuming and labor intensive process for libraries. Several studies have shown that outsourcing authority work is less expensive than doing the work in house. Libraries are using automated authority control systems to clean up existing databases, provide ongoing authority control for current cataloging, and keep databases synchronized with changes in headings. As libraries make the decision to rely on vendor services for authority control, they must be aware of the limits of vendor-provided service and the responsibility of the library itself. Zhu and Seggern discussed both realistic and unrealistic expectations for vendor-supplied authority control.[104] Van Pulis reported findings regarding authority records for name headings in relation to vendor processing of bibliographic records and subsequent catalog.[105] She examined the "first time use" of name headings in the context of outsourced authorities processing and NACO participation.

Subject Authority Control

Subject authority headings are becoming more important in the Internet environment. Subject authority control is intended to help users browse easily and more efficiently using their terminology to the controlled vocabulary used in the system. The consistency and maintenance of the subject authority file is a concern. After analyzing key aspects of FRBR and FRANAR models, Delsey suggested ways of approaching the refinement and extension of the models.[106] Lei Zeng discussed global sharing of subject access and subject authority data that have been used in information organization, storage, and access in libraries and archives.[107]

The Subject Authority Cooperative (SACO) program is a component of the Program for Cooperative Cataloging (PCC). Cristan reported on SACO activities in Latin America and provided a brief history and background of the PCC and the SACO program and participation in SACO.[108] She concluded with an update on the current activities taking place in Mexico in the development of a bilingual subject headings list based on LCSH.

Recruitment and Training of Catalogers

Recruiting and training of cataloging staff remains a topic of interest. Anderson and Shelton provided a sample test to help the employers with successfully screening and hiring support staff for cataloging positions.[109] Anthony and Garbs studied the results of recruiting efforts of academic libraries to fill cataloger positions.[110] The authors created and distributed a survey to college and research libraries that advertised for full-time cataloging positions between July 2000 and July 2002 to determine outcomes of the hiring efforts. The survey revealed that libraries continued to experience difficulties recruiting catalogers for academic libraries. To determine common aspects of employer's expectations, Hall-Ellis conducted two studies related to recruiting and hiring. In her first paper, she studied 150

entry-level cataloger-position announcements published in *American Libraries* and posted by AutoCat and the Colorado State Library during a three-year period.[113] She identified employers' expectations and requirements among all types of libraries. The second study looks at employer expectations of filling technical service managerial positions.[112] The study revealed that employers expect prospective managers to have experience in cataloging, classification, authority control, acquisitions, supervisory and training abilities, bibliographic control tasks, technical understandings, and familiarities with a theoretical basis for organization technical skills (bibliographic utilities, tools) and nonlibrary specific competencies.

In another survey, Hristov investigated current trends among the ARL member libraries in cross-training catalogers to provide reference services.[115] Her research revealed that approximately one third of ARL libraries are engaging in cross-training. She reported perceptions that cross-training can enhance the services libraries provide; but thoughtful planning and coordination between technical services and reference were recommended to ensure the success of the program.

DeZelar-Tiedman, Camden, and Uhl reported on a project to address concerns regarding recruiting catalogers into professional librarian positions.[114] They traced the development of a mentoring program for aspiring catalogers, sponsored and administered by the ALCTS Cataloging and Classification Section Committee on Education, Training, and Recruitment for Cataloging. The authors provided background information on the program as well as results and an assessment on the pilot programs.

Many libraries use non-MLS professionals to perform cataloging. Developing materials to help train new catalogers, whether they are librarians, paraprofessional, or student assistants, is increasingly important. The second edition of Ferguson's *MARC/AACR2/Authority Control Tagging: A Blitz Cataloging Workbook* can be used when teaching and training new catalogers.[115] This book offers a simplified presentation of cataloging rules with practical examples in a workbook format. *Unlocking the Mysteries of Cataloging: A Workbook of Examples,* by Haynes and Fountain, can be used in teaching and training new catalogers on description, classification, subject analysis, and MARC 21.[116] It includes a discussion of problems that arise during cataloging and presents examples and exercises in a workbook format.

Education for Library Cataloging: International Perspectives, edited by Sun and Carter, is a collection of articles that examine cataloging and classification training programs around the world. [117] Library school faculty and professional librarians from Europe, Africa, Asia, Australia, Latin America, and the Middle East presented case studies and overviews of library and information-school programs.

Hill identified three factors that contribute to the challenges of training newly hired catalogers: library and information science programs, the increased complexity of cataloging, and the capacity of libraries to carry out training.[118] She described possible approaches to a solution. In another article, Hill discussed the characteristics and skills that catalogers will need in the area of acquiring and organizing electronic resources and applying metadata standards, and how the catalogers will acquire these skills.[119] Hider studied how the catalogers and metadata specialists acquire their continuing professional education.[120] His study showed that catalogers are undertaking a broad range of activities. They indicate a preference for short cataloging courses, but also are looking for more formal and long-term programs to upgrade their skills and knowledge in both traditional and nontraditional cataloging. Many catalogers expect their employers to provide support for advancing their careers.

Summary

Analysis of the cataloging and classification literature of 2005 and 2006 showed the future of catalog and cataloging standards to be a persistent topic. Dissatisfaction with the current OPAC systems and their functionality was clearly expressed. The potential of the FRBR model to improve bibliographic access and OPAC's display continue to be a hope and libraries are experimenting with the model. Issues about applying current cataloging tools and standards were raised, and this continues to be an area of concern. The role of catalogers is still in transition, and research in this area demonstrated a definite shift from performing cataloging to a greater focus on management and creating metadata.

The review of authority control literature reveals important recent contributions to the field. Case studies and survey-based articles provide valuable data on current practice. Authority control for multiple scripts and subject headings and the development of the Unicode Standard were the theme of several works. Ability to browse in nonroman scripts continued to be important issue for Internet users. More studies are needed to better determine how authority records perform in the Web-based environment. Library scholarship also needs to address the relative importance of authority control in general.

Libraries and the cataloging community will be facing a series of challenges in the next few years. Development of RDA and changing the cataloging rules to include the FRBR are likely to have a profound effect on library operations. Misgivings about the functionality of RDA and the timing of its implementation find expression in the current library literature.

Library literature dealing with cataloging issues is diverse and exciting to follow. The volume and qual-

ity of research encountered suggest that the community is responding quickly to the changes that are on the horizon. Librarians are more critical of some of the decisions being made, even when those decisions come from LC. Simultaneously, case studies and surveys are examining current trends in libraries and seeking new and better ways to provide the library user with quality cataloging that continues to be the backbone of effective research, be it via the library catalog or the Internet.

More studies on the future of the online catalog and its accessibility can be expected. The library community will continue researching cataloging and classification standards and their applications in the current Web environment. As the cataloging community declines in numbers and cataloging and classification training remains in short supply, some thought should be given to the future of the discipline of cataloging and its role in the organization of information.

References

1. Karen Calhoun, *The Changing Nature of the Catalog and Its Integration with Other Discovery Tools: Final Report,* prepared for the Library of Congress, Mar. 17, 2006, www.loc.gov/catdir/calhoun-report-final.pdf (accessed July 23, 2007).

2. Ibid., 26.

3. University of California Libraries, *Rethinking How We Provide Bibliographic Services for the University of California,* final report of the Bibliographic Services Task Force, Dec. 2005, http://libraries.universityofcalifornia.edu/sopag/BSTF/Final.pdf (accessed July 23, 2007).

4. North Carolina State Libraries, "NCSU Libraries Unveils Revolutionary, Endeca-Powered Online Catalog," news release, Jan. 12, 2006, www.ncsu.edu/news/press_releases/06_01/007.htm (accessed July 23, 2007).

5. Kristen Antelman, Emily Lynema, and Andrew K. Pace, "Toward a Twenty-First Century Library Catalog," *Information Technology & Libraries* 25, no. 3 (2006): 128–39.

6. Deanna B. Marcum, "The Future of Cataloging," *Library Resources & Technical Services* 50, no. 1 (2006): 5–9.

7. Jackie Byrd et al., *A White Paper on the Future of Cataloging at Indiana University* (Jan. 15, 2006), www.iub.edu/~libtserv/pub/Future_of_Cataloging_White_Paper.doc (accessed July 23, 2007).

8. Andrew K. Pace, "My Kingdom for an OPAC," *American Libraries* 36, no. 2 (2005): 48–49.

9. Karen Schneider, "How OPACS Suck Part 1: Relevance Rank (or the Lack Thereof)," online posting, ALA TechSource, March 13, 2006, www.techsource.ala.org/blog/2006/03/how-opacs-suck-part-1-relevance-rank-or-the-lack-of-it.html (accessed July 23, 2007); "How OPACS Suck Part 2: The Checklist of Shame," online posting, ALA TechSource, April 26, 2006, www.techsource.ala.org/blog/2006/04/how-opacs-suck-part-2-the-checklist-of-shame.html (accessed July 23, 2007); "How OPACS Suck Part 3: The Big Picture," online posting, ALA TechSource, May 20, 2006, www.techsource.ala.org/blog/2006/05/how-opacs-suck-part-3-the-big-picture.html (accessed July 23, 2007).

10. Library of Congress, *Working Group on the Future of Bibliographic Control,* www.loc.gov/bibliographic-future (accessed July 23, 2007).

11. Barbara B. Tillett, "*FRBR* and Cataloging for the Future," *Cataloging & Classification Quarterly* 39, no. 3/4 (2005): 197–205.

12. Ibid., 1.

13. Diane I. Hillmann, "Is There a Future for Cataloging?" *Technicalities* 26, no. 4 (2006): 9–10.

14. National Library of Australia, *Beyond the OPAC: Future Directions for Web-based Catalogues,* conference of the Australia Committee on Cataloging (Sept. 16, 2006), www.nla.gov.au/lis/stndrds/grps/acoc/papers2006.html (accessed July 23, 2007).

15. Jinnie Y. Davis, "How Online Libraries Can Succeed," *Library Issues* 27, no. 2 (Nov. 2006): 4.

16. Ibid.

17. Thomas Mann, "Will Google's Keyword Searching Eliminate the Need for LC Cataloging and Classification?" online posting, Library of Congress Professional Guild—The Future of Cataloging, Aug. 15, 2005, www.guild2910.org/searching.htm (accessed July 23, 2007).

18. Sheila Bair, "Toward a Code of Ethics for Cataloging," *Technical Services Quarterly* 23, no. 1 (2005): 13–26.

19. Stanley J. Wilder, *Demographic Change in Academic Librarianship* (Washington, D.C.: Association of Research Libraries, 2003).

20. Joan M. Leysen and Jeanne M. K. Boydston, "Supply and Demand for Catalogers: Present and Future," *Library Resources & Technical Services* 49, no. 4 (2005): 250–65.

21. Jeanne M. K. Boydston and Joan M. Leysen, "Observations on the Catalogers' Role in Descriptive Metadata Creation in Academic Libraries," *Cataloging & Classification Quarterly* 43, no. 2 (2006): 3–17.

22. Susan Carol Curzon, *Managing Change: A How-to-Do-It Manual for Librarians*, rev. ed. (New York: Neal-Schuman, 2006).

23. IFLA Study Group on Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records: Final Report* (Munich: G.K. Sauer, 1998), www.ifla.org/VII/s13/frbr/frbr.htm (accessed July 23, 2007).

24. Linda Gonzalez, "What Is *FRBR*?" *Library Journal.com NetConnect* 130 (Apr. 15, 2005): 12–14, www.libraryjournal.com/index.asp?layout=article&articleid=CA515803 (accessed Aug. 4, 2007).

25. Barbara B. Tillett, "What Is *FRBR*? A Conceptual Model for the Bibliographic Universe," *Australian Library Journal* 54, no. 1 (2005): 24–30.

26. Patrick Le Boeuf, ed., *Functional Requirements for Bibliographic Records (FRBR): Hype or Cure-All?* (Binghamton, N.Y.: Haworth, 2005).

27. David Mimno, Gregory Crane, and Alison Jones, "Hierarchical Cataloging Records: Implementation a *FRBR* Catalog," *D-Lib Magazine* 11, no. 10 (2005), purl.pt/302/1/dlib/october05/crane/10crane.html (accessed July 23, 2007).

28. Martha M. Yee, "FRBRization: A Method for Turning Online Public Finding Lists into Online Public Catalogs," *Information*

Technology and Libraries 24, no. 3 (2005): 77–95.

28. Jennifer Bowen, "*FRBR* Coming Soon to Your Library," *Library Resources & Technical Services* 49, no. 3 (2005): 173–88.

30. Allyson Carlyle, "Understanding *FRBR* as a Conceptual Model: *FRBR* and the Bibliographic Universe," *Library Resources & Technical Services* 50, no. 4 (2006): 264–73.

31. Olivia M. A. Madison, "Utilizing the *FRBR* Framework in Designing User-focused Digital Content and Access System," *Library Resources & Technical Services* 50, no. 2 (2006): 10–15.

32. Cathy Weng and Jia Mi, "Towards Accessibility to Digital Cultural Materials: A *FRBR*ized Approach," *OCLC Systems & Services* 22, no. 3 (2006): 217–32.

33. Carol Van Nuys et al., "The Paradigma Project and its Quest for Metadata Solutions and User Services," *International Cataloguing & Bibliographic Control* 34, no. 2 (2005): 29–35.

34. Zorana Ercegovac, "Multiple-version Resources in Digital Libraries: Towards User-centered Displays," *Journal of the American Society for Information Science and Technology* 57, no. 8 (2996): 1023–32.

35. Glenn E. Patton, "FRAR: Extending *FRBR* Concepts to Authority Data," *International Cataloging & Bibliographic Control* 35, no. 2 (2006): 41–45.

36. Steve Shadle, "*FRBR* and Serials: An Overview and Analysis," *Serials Librarian* 50, no. 1/2 (2006): 83–103.

37. Ed Jones, "The *FRBR* Model As Applied to Continuing Resources," *Library Resources & Technical Services* 49, no. 4 (2005): 227–42.

38. Jane Cho, "A Study on the Application Method of the *Functional Requirement for Bibliographic Records* (*FRBR*) to the Online Public Access Catalog (OPAC) in Korean Libraries," *Library Collections, Acquisitions & Technical Services* 30, no. 3/4 (2006): 202–13.

39. Richard P. Smiraglia, ed., *Metadata: A Cataloger's Primer* (Binghamton, N.Y.: Haworth, 2005).

40. Sheila S. Intner, Susan S. Lazinger, and Jean Weihs, *Metadata and Its Impact on Libraries* (Westport, Conn.: Libraries Unlimited, 2006).

41. Karen Coyle, "Understanding Metadata and Its Purpose," *The Journal of Academic Librarianship* 31, no. 2 (2005): 160–63.

42. Michael A. Chopey, "Planning and Implementing a Metadata-Driven Digital Repository," *Cataloging & Classification Quarterly* 40, no. 3/4 (2005): 255–87.

43. Jeffrey Beall, "The Death of Metadata," *Serials Librarian* 51, no. 2 (2006): 55–74.

44. Michael Gorman, "Metadata Dreaming: The Keynote Speech at the Canadian Metadata Forum, September 2005," *Serials Librarian* 51, no. 2 (2006): 47–54.

45. IFLA Cataloguing Section Working Group on the Use of Metadata Schemas, *Guidance on the Structure, Content, and Application of Metadata Records for Digital Resources and Collections,* draft, Oct. 27, 2003, www.ifla.org/VII/s13/guide/metaguide03.pdf (accessed Nov. 12, 2007); Lynne C. Howarth, "Enabling Metadata: Creating Core Records for Resource Discovery; 2004 Update on Activities of the IFLA Cataloguing Section Working Group on the Use of Metadata Schemas," *International Cataloguing & Bibliographic Control*

34, no. 1 (2005): 14–17.

46. Robert Fox, "Cataloging for the Masses," *OCLC Systems & Services* 22, no. 3 (2006): 166–72.

47. Krystyna K. Matusiak, "Towards User-centered Indexing in Digital Image Collections," *OCLC Systems & Services* 22, no. 4 (2006): 283–98.

48. Linda Cantara, "Encoding Controlled Vocabularies for the Semantic Web Using SKOS Core," *OCLC Systems & Services* 22, no. 2 (2006): 111–14.

49. Heidi G. Lerner and Seth Jerchower, "The Penn/Cambridge Genizah Fragment Project: Issues in Description, Access, and Reunification," *Cataloging & Classification Quarterly* 42, no. 1 (2006): 21–39.

50. Bradley D. Westbrook et al., "Beyond Google: A Union Catalog for Art Image Metadata," *Visual Resources Association Bulletin* 31, no. 2 (2005): 45–47.

51. David Banush, Martin Kurth, and Jean Pajerek, "Rehabilitating Killer Serials: An Automated Strategy for Maintaining E-journal Metadata," *Library Resources & Technical Services* 49, no. 3 (2005): 190–203.

52. Crystal Abe and Jane Greenberg, "Usability of a Metadata Creation Application for Resource Authors," *Library and Information Science Research* 27, no. 2 (2005): 177–89.

53. Mike Taylor and Adam Dickmeiss, "Delivering MARC/XML Records from the Library of Congress Catalogue Using the Open Protocols SRW/U and Z39.50," *International Cataloguing and Bibliographic Control* 35, no. 1 (Jan./Mar. 2006): 7–10; Vladimir Skvortsov, Alla Pashkova, and Olga Zhlobinskaya, "UNIMARC XML Slim Schema: Living in a New Environment," *International Cataloguing and Bibliographic Control* 35, no. 1 (Jan./Mar. 2006): 11–16; Joaquim Carvalhho, "XML Representation of the UNIMARC Manual: A Working Prototype," *International Cataloguing and Bibliographic Control* 35, no. 1 (Jan./Mar. 2006): 17–23; Sally H. McCallum, "MARC/XML Sampler," *International Cataloguing and Bibliographic Control* 35, no. 1 (Jan./Mar. 2006): 4–6.

54. *Anglo-American Cataloguing Rules,* 2nd ed., 2002 rev., 2005 update (loose-leaf, Chicago: ALA; Ottawa: Canadian Library Association; London: Chartered Institute of Library and Information Professional, 2005–).

55. Elizabeth Unger Mangan, *Cartographic Materials: A Manual of Interpretation for AACR2, 2002 Revision* (Chicago: American Library Assn., 2003).

56. J. H. Bowman, "The Development of Description in Cataloguing Prior to ISBD," *Aslib Proceedings: New Information Perspectives* 58, no. 1/2 (2006): 34–48.

57. David Procházka, "The Development of Uniform Titles for Choreographic Works," *Cataloging & Classification Quarterly* 42, no. 1 (2006): 7–20.

58. Philip Hider and Saralee Turner, "The Application of AACR2's Rules for Personal Names in Certain Languages," *Cataloging & Classification Quarterly* 43, no. 2 (2006): 37–52.

59. Qiang Jin, "Eliminating Redundant Entries in Bibliographic Records," *Library Collections, Acquisitions, & Technical Services* 29, no. 4 (2005): 412–24.

60. Joint Steering Committee for the Revision of Anglo-American Cataloguing Rules. *RDA: Resource Description and Access,*

www.collectionscanada.ca/jsc/rda.html (accessed July 21, 2007).

61. Norm Medeiros, "On the Dublin Core Front: The Future of the Anglo-American Cataloguing Rules," *OCLC Systems & Services* 21, no. 4 (2005): 261–63.

62. Sheila S. Intner, "RDA: Will It Be Cataloger's Judgment or Cataloger's Judgment Day?" *Technicalities* 26, no. 2 (2006): 10–12.

63. Diane I. Hillmann, "RDA for Who?" *Technicalities* 26, no. 3 (2006): 8–10.

64. Paul J. Weiss and Molly R. T. Larkin, "AACR3 Is Coming—What Is It?" *Serial Librarians* 50, no. 3/4 (2006): 285–94.

65. Lois Mai Chan, *Library of Congress Subject Headings: Principle and Application*, 4th ed. (West Port, Conn.: Libraries Unlimited, 2005).

66. Library of Congress, Subject Cataloging Division, *Library of Congress Subject Headings*, 29th ed. (Washington, D.C.: Library of Congress, 2006); Library of Congress, Cataloging Policy and Support Office, *Free-floating Subdivisions: An Alphabetical Index*, 18th ed. (Washington, D.C.: Library of Congress, 2006).

67. Tina Gross and Arlene G. Taylor, "What Have We Got to Lose? The Effect of Controlled Vocabulary on Keyword Searching Results," *College & Research Libraries* 66, no. 3 (2005): 212–30.

68. Karen S. Fischer, "Critical Views of LCSH, 1990–2001: The Third Bibliographic Essay," *Cataloging & Classification Quarterly* 41, no. 1 (2005): 63–109.

69. Sanford Berman, *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People* (Metuchen, N.J.: Scarecrow, 1971).

70. Steven A. Knowlton, "Three Decades Since Prejudices and Antipathies: A Study of Changes in the Library of Congress Subject Headings," *Cataloging & Classification Quarterly* 40, no. 2 (2005): 123–45.

71. Allen B. Ashman, "The Persistence of Superseded Subject Headings in Online Catalogs," *Technical Services Quarterly* 24, no. 2 (2006.): 27–34.

72. Jen Wolfe, "FAST: A New System of Subject Access for Cataloging and Metadata," *ALCTS Newsletter Online* 17, no. 4 (2006): 38.

73. "Subjects Analysis Subcommittee on FAST Programs in New Orleans," *ALCTS Newsletter Online* 17, no. 3 (3006): 1.

74. David Miller, Tony Olson, and Sara Shatford Layne, "Promoting Research and Best Practices in Subject Reference Structures: A Decade of Work by the Subject Analysis Committee," *Library Resources & Technical Services* 49, no. 3 (2005): 145–66.

75. Kayo Denda, "Beyond Subject Headings: A Structured Information Retrieval Tool for Interdisciplinary Fields," *Library Resources & Technical Services* 49, no. 4 (2005): 266–75.

76. James D. Anderson and Melissa A. Hofmann, "A Fully Faceted Syntax for Library of Congress Subject Headings," *Cataloging & Classification Quarterly* 43, no. 1 (2006): 7–38.

77. Qiang Jin, "Corporate Body Name Changes: Helping the User Search Efficiently and Effectively," *Library Collections, Acquisitions, & Technical Services* 29, no. 3 (2005): 270–82; Lois Mai Chan, *Library of Congress Subject Headings: Principles of Structure and Policies for Application* (Washington, D.C.: Library of Congress, 1990).

78. Lona Hoover, "A Beginners' Guide for Subject Analysis of Theses and Dissertations in the Hard Sciences," *Cataloging & Classification Quarterly* 41, no. 1 (2005): 133–61.

79. Jeannette Ho, "Applying Form/Genre Headings to Foreign Films: A Summary of AUTOCAT and OLAC-LIST Discussions," *Cataloging & Classification Quarterly* 40, no. 2 (2005): 73–88.

80. David Miller, "Improving Access to Audio-Visual Materials by Using Genre/Form Terms," *Cataloging & Classification Quarterly* 41, no. 1 (2005): 212–15.

81. Alenka Sauperl, "Subject Cataloging Process of Slovenian and American Catalogers," *Journal of Documentation* 61, no. 6 (2005): 713–34.

82. Mona L. Scott, *Dewey Decimal Classification, 22nd ed.: A Study Manual and Number Building Guide* (Westport, Conn.: Libraries Unlimited, 2005).

83. Joan S. Mitchell and Diane Vizine-Goetz, eds., "Moving beyond the Presentation Layer: Content and Context in the Dewey Decimal Classification (DDC) System," *Cataloging & Classification Quarterly* 42, no. 3/4 (special issue, 2006).

84. Patrice Landry, "The Use of the Dewey Decimal Classification (DDC) for the Organization of National Bibliographies: Switzerland, Germany and Austria," *International Cataloging & Bibliographic Control* 35 no. 3 (2006): 59–62.

85. Susanna Dal Porto and Andrew Marchitelli, "The Functionality and Flexibility of Traditional Classification Schemes Applied to a Content Management System (CMS): Facets, DDC, JITA," *Knowledge Organization* 33, no. 1 (2006): 35–44.

86. Jay Shorten, Michele Seikel and Janet H. Ahrberg, "Why Do You Still Use Dewey?: Academic Libraries That Continue with Dewey Decimal Classification," *Library Resources & Technical Services* 49, no. 2 (2005): 123–36.

87. Library of Congress, Cataloging Distribution Service, *LC Classification Schedules* (Washington, D.C.: Library of Congress, 2005/2006).

88. Arlene G. Taylor, *Introduction to Cataloging and Classification,* 10th ed. (West Port, Conn.: Libraries Unlimited, 2006).

89. Bhagirathi Subrahmanyam, "Library of Congress Classification Numbers: Issues of Consistency and Their Implications for Union Catalogs," *Library Resources & Technical Services* 50, no. 2 (2006): 110–19.

90. Adam Chandler and Jim LeBlanc, "Exploring the Potential of a Virtual Undergraduate Library Collection Based on the Hierarchical Interface to LC Classification," *Library Resources & Technical Services* 50, no. 3 (2006): 157–65.

91. Sue Wartzok and Mirtha Hernandez, "Reclassifying the Official Records of the United Nations: A Library's United Effort," *Technical Services Quarterly* 23, no. 1 (2005): 53–69.

92. Robert E. Wolverton, "Authority Control in Academic Libraries in the United States: A Survey," *Cataloging & Classification Quarterly* 41, no. 1 (2005): 111–31.

93. Robert E. Wolverton, "Becoming an Authority Control: an Annotated Bibliography of Resources," *Library Resources & Technical Services* 50, no. 1 (2006): 31–41.

94. Betsy Simpson and Priscilla Williams, "Growing a NACO Program: Ingredients for Success," *Cataloging & Classification Quarterly* 40, no. 1 (2005): 123–32.

95. Michael A. Weber, Stephanie A. Steely, and Marilou Z. Hinchcliff, "A Consortial Authority Control Project by the Keystone Library Network," *Cataloging & Classification Quarterly* 43, no. 1 (2006): 77–98.

96. Dustin P. Larmore, "A New Kid on the Block: The Start of a NACO Funnel Project and What Is Needed to Start Your Own," *Cataloging & Classification Quarterly* 42, no. 2 (2006): 75–81.

97. Thomas B. Hickey, Jenny Toves, and Edward T. O'Neill, "NACO Normalization: A Detailed Examination of the Authority File Comparison Rules," *Library Resources & Technical Services* 50, no. 3 (2006): 166–72.

98. Glenn E. Patton, "Extending *FRBR* to Authorities," *Cataloging & Classification Quarterly* 39, no. 3/4 (2005): 39–48.

99. Dick R. Miller, "XOBIS—An Experimental Schema for Unifying Bibliographic and Authority Records," *Cataloging & Classification Quarterly* 39, no. 3/4 (2005): 285–303.

100. Joan M. Aliprand, "Scripts, Languages, and Authority Control," *Library Resources & Technical Services* 49, no. 4 (2005): 243–49.

101. Heidi Lerner, "Anticipating the Use of Hebrew Script in the LC/NACO Authority File," *Library Resources & Technical Services* 50, no. 4 (2006): 252–63.

102. Iman Khairy, "Authority Control of Arabic Personal Names from the Classical Period at the Bibliotheca Alexandrina," *International Cataloging & Bibliographic Control* 35, no. 2 (2006): 36–40.

103. Qiang Jin, "Is the Current Way of Constructing Corporate Authority Records Still Useful?" *Information Technology & Libraries* 24, no. 2 (2005): 68–76.

104. Lihong Zhu and Marilyn von Seggern, "Vendor-Supplied Authority Control: Some Realistic Expectations," *Technical Services Quarterly* 23, no. 2 (2005): 49–65.

105. Noelle Van Pulis, "'First Time Use' (FTU) Name Headings, Authority Control, and NACO," *Library Management* 27, no. 8 (2006): 562–74.

106. Tom Delsey, "Modeling Subject Access: Extending the *FRBR* and FRANAR Conceptual Models," *Cataloging & Classification Quarterly* 39, no. 3/4 (2005): 49–61.

107. Marcia Lei Zeng, "Sharing and Use of Subject Authority Data," *International Cataloging & Bibliographic Control* 35, no. 3 (2006): 52–54.

108. Ana Lupe Cristan, "The SACO Program in Latin America," *International Cataloguing and Bibliographic Control* 34, no. 3 (2005): 54–58.

109. David G. Anderson and Judith M. Shelton, "Use of Work Sample Exercises as Part of Screening Candidates for Support Staff Positions in Cataloging," *Technical Services Quarterly* 23, no.1 (2005): 1–12.

110. Paul L. Anthony and Jill A. Garbs, "A Scarce Resource? A Study of Academic Cataloger Recruitment 2000–2002," *Cataloging & Classification Quarterly* 41, no. 1 (2005): 45–62.

111. Sylvia D. Hall-Ellis, "Descriptive Impressions of Entry-Level Cataloger Positions as Reflected in *American Libraries*, AutoCAT, and the Colorado State Library Jobline, 2000–2003," *Cataloging & Classification Quarterly* 40, no. 2 (2005): 33–72.

112. Sylvia D. Hall-Ellis, "Descriptive Impressions of Managerial and Supervisory Cataloger Positions as Reflected in *American Libraries*, AutoCAT, and the Colorado State Library Jobline, 2000–2004: A Content Analysis of Education, Competencies, and Experience," *Cataloging & Classification Quarterly* 42, no. 1 (2006): 55–92.

113. L. Nathalie Hristov, "Trends, Issues and Practical Solutions for Cross Training Catalogers to Provide Reference Services: A Survey-Based Study," *Technical Services Quarterly* 23, no. 1 (2005): 35.

114. Christine DeZelar-Tiedman, Beth Picknally Camden, and Rebecca Uhl, "Growing Our Own: Mentoring the Next Generation of Catalog Librarians," *Cataloging & Classification Quarterly* 43, no. 2 (2006): 19–35.

115. Bobby Ferguson, *MARC/AACR2/Authority Control Tagging: A Blitz Cataloging Workbook,* 2nd ed. (Westport, Conn.: Libraries Unlimited, 2005).

116. Elizabeth Haynes and Joanna F. Fountain, *Unlocking the Mysteries of Cataloging: A Workbook of Examples* (Westport, Conn.: Libraries Unlimited, 2005).

117. Dajin D. Sun and Ruth C. Carter, ed., *Education* for *Library Cataloging: International Perspectives* (Binghamton, N.Y.: Haworth, 2006).

118. Janet Swan Hill, "Cataloging Boot Camp: The Training Issue for Catalogers," paper presented at ACRL Twelfth National Conference, Apr. 7–10, 2005 Minneapolis, Minn., www.ala.org/ala/acrl/acrlevents/hill05.pdf (accessed July 23, 2007).

119. Janet Swan Hill, "Analog People for Digital Dreams: Staffing and Educational Considerations for Cataloging and Metadata Professionals," *Library Resources & Technical Services* 49, no. 1 (2005): 14–18.

120. Philip Hider, "A Survey of Continuing Professional Development Activities and Attitudes Amongst Catalogers," *Cataloging & Classification Quarterly* 42, no. 2 (2006): 35–58.

Provenance Evidence in Bibliographic Records

Demonstrating the Value of Best Practices in Special Collections Cataloging

By M. Winslow Lundy

Noting and tracing former ownership of rare materials has been a common cataloging practice for many years. This paper explores the value of examining special collections materials that may not be old and rare for evidence of provenance in order to provide notes and added entries pointing to former owners in bibliographic records. This case study of a small group of mid-twentieth century books, formerly owned by a Swiss family, demonstrates the significance of the cataloging process in revealing information about the original owners. Building on the bibliographic work of catalogers working with a collection of books on mountaineering topics, the author uses the case study to show how cataloging books as objects with a history can enable users to find new topics of research in special collections materials.

For special collections librarians and users of their collections, provenance is an important aspect of the materials. In the exhibitions they mount and in the classes they teach, many special collections librarians often highlight evidence of previous ownership of materials in their collections. In addition to research interests in the content of rare books, scholars working in special collections also may focus on the materials as objects and the evidences of provenance they reveal. While the *Oxford English Dictionary*'s first general definition of provenance is "the fact of coming from some particular source or quarter; origin; derivation," the second is more specific to materials in library or museum collections: "The history or pedigree of a work of art, manuscript, rare book, etc.; *concr.*, a record of the ultimate derivation and passage of an item through its various owners."[1] Carter likewise defines provenance as "the pedigree of a book's previous ownership" and notes that "the evidences of [a book's] earlier history are always of interest (documentary or sentimental) and sometimes of importance."[2] The provenance of a particular work of art or printed work can be verified in several ways: authenticating documentation may accompany the object, catalogs or lists may include entries confirming the names of former owners, or the work itself may contain the evidence of former ownership.

Provenance has significance for special collections and the users of special collections for a number of reasons: (1) former ownership may make the book or object more valuable or important to users and to the holding institution; (2) knowledge of the content of a former owner's collection may bring insight to the intellectual interests and pursuits of a particular person; and (3) historians of the book and bibliographers often have a keen interest in the personal librar-

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ies of persons well known in their fields—for example, authors, politicians, or scientists, particularly those who lived in an earlier age. In his comprehensive reference work, *Provenance Research in Book History,* Pearson categorized and discussed the various types of provenance evidence and presented the bibliographical resources and indexes that support scholarly research on private libraries from the fifteenth to the early nineteenth century.[3]

To keep a record of the characteristics denoting value and significance and to facilitate the study of former ownership, catalogers of rare materials routinely note the provenance evidence in books they catalog and many provide added entries for the previous owners of the materials. The physical evidence of former ownership includes autographs or annotations, stamped names, bookplates, book labels, and presentation inscriptions, among others. The uniqueness of provenance evidence makes it paramount for catalogers to note the names of former owners to establish the relationship of other materials belonging to the same person or family. A recent posting to the rare books list Exlibris-L asked for information concerning any books libraries currently hold with provenance indicating that the books belonged to the Sidney family of Penshurst Place, Kent, beginning in the sixteenth century.[4] For librarians to be able to respond to such a message, provenance information must be searchable in their catalogs, whether legacy files or online catalogs.

Over time, cataloging manuals and standards have developed provisions for the treatment of provenance in the cataloging record. In the final chapter of his manual on cataloging rare books, Dunkin included a section on the condition and history of a book and mentioned that "the history of a book may be important if a noted former owner is involved."[5] Dunkin's manual was written in the days when library catalogs were still in card form. In addition to bibliographic files in their card catalogs, rare book and special collections departments maintained many separate files—for example, files for former owners, donors, bookplates, binders, signatures, or authors' presentation copies. Many of those legacy paper files that indexed local or copy-specific information are still the only form of access to former ownership of materials that have been held by institutions for many years. Such is the case in the libraries in which the author of this paper has worked. Even if the materials represented in card catalogs have enjoyed retrospective conversion and are represented in the online environment, the legacy files in special catalogs may not have been given the same treatment as the bibliographic elements of the paper files.

In 1979, an ad hoc committee of the Independent Research Libraries Association (IRLA) submitted a report proposing a number of new Machine-Readable Cataloging (MARC) fields to enable catalogers to record information of significance for rare and special materials, including copy-specific and provenance information.[6] Most of the proposals found subsequent adoption in the MARC bibliographic format. The IRLA report provided significant evidence that, while many libraries were adopting the new edition of the *Anglo-American Cataloguing Rules* and were availing themselves of the online shared-cataloging opportunities of the bibliographic databases, special-collections librarians were aware of the need to establish MARC standards that would accommodate their special cataloging needs. They desired a way to describe and provide access not only to the content of their materials but also to the materials as exemplars of various genres and types of objects and to the physical history of an individual copy subsequent to its publication. Several years after the IRLA report, the Library of Congress issued a specialized cataloging manual for rare materials, *Bibliographic Description of Rare Books (BDRB).*[7] A second edition was published in 1991 under the title *Descriptive Cataloging of Rare Books (DCRB).*[8] Both included rules for noting copy-specific information: *BDRB* 7C18 and *DCRB* 7C18.

The current cataloging standards for description and access for both general and rare materials are *Anglo-American Cataloguing Rules,* 2nd edition, 2002 revision *(AACR2), ISBD(A): International Standard Bibliographic Description of Older Monographic Publications (Antiquarian),* and the recently published *Descriptive Cataloging of Rare Materials (Books) (DCRM(B)).*[9] Specific rules in the three standards that instruct in the description of copy-specific information are found in *AACR2* 1.7B20, 2.7B20, and 2.18F1; *ISBD(A)* 7.9; and *DCRM(B)* 7B19.2. *AACR2* chapters 22 and 24 give provisions for creating headings for personal and corporate names. *AACR2* is in the process of being revised; *DCRM(B)* replaces its predecessor, *DCRB*. Although the revision process is not complete, *RDA: Resource Description and Access,* the successor to *AACR2,* will include instructions for noting provenance information. At the time of the writing of this paper, *RDA* part A, rule 2.15, labeled "Custodial history," is slated for making those provisions.[10] *DCRM(B)* rule 7B19.2 includes provisions for noting provenance.

The MARC bibliographic format defines several standard fields for use by catalogers in recording data relevant to provenance information.[11] Fields 541 and 561 are note fields that contain information concerning the most recent source of acquisition and provenance history. In addition, MARC field 590 is reserved as a note field for local and copy-specific information, which may include provenance information—for example, "Author's presentation copy" or "Special Collections copy, signed by Benjamin Franklin." For libraries that use the MARC holdings format, field 852—which can be embedded in the bibliographic record—provides an alternative for recording provenance information. Field 852 contains information that identifies the holding library, location, and copy-specific information for individual copies. The public note subfield z ($z) may contain a free text state-

ment such as "Signed by the author" or "With signature of [former owner]" to indicate provenance.[12]

Added entries for personal and corporate names occur in bibliographic fields 700 and 710, respectively. A relator term or code explaining the relationship of the person or corporate body to the material may be used at the end of the heading in $e (relator term) or $4 (relator code), for example:

> 700 1_ Dickens, Charles, $d 1812–1870, $e
> former owner
> 700 1_ Dickens, Charles, $d 1812–1870, $4 fmo

Both relator terms and relator codes are defined in the MARC bibliographic format for use with main entry fields for personal and corporate names (100 and 110), although, in the author's experience, the relators are used much less frequently in the main entry fields than in the added entry fields (7XX).

MARC field 655 is defined for genre and form index terms specified by standard thesauri. The Bibliographic Standards Committee, Rare Books and Manuscripts Section (RBMS), Association of College and Research Libraries maintains the authorized list of relator terms and six thesauri of form and genre terms appropriate to various aspects of special-collections materials. *Provenance Evidence,* first published in paper form in 1988, is now also available online with the other RBMS thesauri.[13] Examples of terms in the thesaurus are "Autographs," "Bookplates," and "Presentation copies" and all of the terms may be subdivided by place (subfield z [$z], period [$y], or other subdivision [$x]).

Literature Review

A review of the literature revealed that a number of articles have been written about rare book cataloging standards and their application in the transition to online catalogs, along with the specific needs for provision of access to more than bibliographic details in cataloging rare books. In 1986, Flannery treated the development of standards to address the concerns many rare book catalog librarians had about ways to incorporate their long standing practice of describing and giving access to the publication details, physical characteristics, and provenance of the materials in their collections.[14] Flannery, in 1986, and Thomas, in 1987, both noted the seminal 1979 IRLA report as the real beginning of the focus on developing standards for rare book cataloging in the online environment.[15] Thomas emphasized the necessity of standards and illustrated how local practice in online catalogs was instituted because of the limitations of MARC with regard to the needs of catalogers to continue to give access to more detailed aspects of their materials. While the

local practice worked for individual libraries as it had done in special card files, local definitions were ultimately not sharable among many libraries in the online environment. He concluded his article with a discussion of the standards that were developed for rare-book cataloging—(ISBD(A), cataloging rules developed for the English Short-Title Catalogue project, and BDRB)—and the proposals in the IRLA report that addressed the need for more specialized MARC fields for special-collections cataloging.

In two articles in the 1980s, Davis discussed the development of rare book cataloging standards.[16] In his 1987 paper, he noted the difficulties of sharing copy-specific information in the large bibliographic databases, Online Computer Library Center (OCLC) catalog, and the union catalog of the Research Libraries Group (RLIN). OCLC uses a "master record" approach that prohibits seeing any local data and allows access only to the record first entered into the system. RLIN libraries, he said, have created copy-specific access points but with a lack of standardization. In the twenty years since he published the article, his points are still valid about the structure of the two bibliographic databases and the local fields many libraries use, but Davis could not have known that the Internet would bring rare book libraries and their collections into the view of all other librarians and researchers. With the recent merger of OCLC and RLG (formerly named Research Libraries Group) and the loading of RLIN records into OCLC WorldCat (OCLC's bibliographic database), members of both groups will have the ability to view individual libraries' bibliographic records.[17] What remains to be seen is how quickly such capability will enable access to local bibliographic information among all libraries. Building on the work of Flannery and Thomas, Adkins investigated progress by 1992 in the area of rare book cataloging standards development.[18] She stressed the need for copy-specific information in rare-book cataloging records because so many researchers are interested in not only the content of the books but also in the materials as artifacts, and suggested that the solution to providing such access is to use the standard fields that have been defined for special rare book files and descriptions. In a report on the 2003 meeting in the United Kingdom concerning the cataloging of early children's books, Attar noted that the long-time function of the bibliographic record is to catalog the book in hand.[19] She reported that the librarians and scholars who were the constituents of the meeting of the Rare Books Group of the Chartered Institute of Library and Information Professionals and the Children's Book History Society came to an agreement about the importance of provenance and other copy-specific information in the bibliographic record. She concluded her narrative by indicating that a detailed catalog record may be a substitute for examination of a copy of a book, thus making it more useful and convenient for the researcher and promoting preservation of the item itself.

The scholarly uses of provenance information have been treated by several authors from different perspectives. Discovering the historical importance of provenance information for identifying who former owners were and what such information can tell us about the history of a particular copy of a book is one such perspective. Bryan recounted her examination and cataloging of a scrapbook that she identified as the compilation of John Charles Brooke (1748–94) of Yorkshire.[20] She described the process by which she discovered who he was, emphasizing the significance of provenance for a collection. Other scholars have investigated provenance and its evidences (marginalia and other annotations, simple markings of passages, and even signatures and inscriptions on the endpapers) to discover not only who former owners were but also to gain an understanding of what previous owners as readers thought about the content of their books. Such is one aspect of the interests of members of the Society for the History of Authorship, Reading, and Publishing.[21] In 2000, Jackson studied readers' marginalia and annotations and assessed their value to scholarly research on attitudes toward books and reading by surveying more than 2,000 books in the British Library and other libraries.[22] She discovered books that had belonged to well-known literary figures, such as William Blake and Samuel Taylor Coleridge, but she also encountered numerous books that had been in the personal libraries of relatively obscure owners. For her study, Jackson used Alston's 1994 short title catalog of books in the British Library that contained manuscript notes and marginalia.[23] Without Alston's work, Jackson's survey would have been much more difficult to undertake. Ronald and Mary Zboray discussed the many elements in the study of book history in the United States.[24] Among the topics they addressed was what the physical evidence in books (marginalia, inscriptions, bookplates, and labels) can reveal about the history of books subsequent to their publication. They cautioned that what researchers can discover may be limited by that physical evidence, for not every reader and previous owner will have left behind some mark.

Pearson devoted a chapter of just over ninety pages to descriptions of provenance indexes in libraries in British, Irish, and North American libraries.[25] In an appendix, he noted that even though cataloging standards as they have developed have provision for treatment of provenance information, many libraries still have paid "scant attention to copy-specific data when creating new catalogue entries for antiquarian materials."[26] Recording and using provenance information in bibliographic records was a topic of discussion at the RBMS MARC for Special Collections Discussion Group at the American Library Association 2007 Midwinter Meeting. Several participants noted that, even though the standards exist for recording and providing access to provenance information, many institutions employ local fields for added entries for former owners. The rationale for using

locally defined fields and indexing them separately is to distinguish the entries for personal or corporate former owners from the entries for persons or corporate bodies as authors. Practices of other institutions include indexing the relator term or relator code in the author index, indexing the relator term or relator code in the keyword index, and recording provenance information not in the bibliographic record but in the holdings record and making it searchable.[27]

Case Study of Cataloging the Mountaineering Collection

Among the specialized collections in the University of Colorado at Boulder (UCB) Special Collections Department, the Mountaineering Collection includes materials about mountaineering topics from around the world as well as significant holdings concerning climbing and hiking in North America. The collection began with the 1977 gift of approximately 400 volumes from John L. Jerome Hart, a Denver attorney and mountaineer. Since that time, the collection has grown by both gift and purchase to approximately 8,000 volumes. The dates of publication of the books range from the seventeenth to the twenty-first century, but the bulk of the materials are from the twentieth century. Most of the twentieth century imprints are not rare or would not be rare without the associations of famous mountaineers. A number of the books, for example, are signed by or have presentation inscriptions from Sir Edmund Hillary, one of the first two men to reach the summit of Mount Everest on May 29, 1953.[28] Other books in the collection contain the signatures or bookplates of less well-known persons or corporate bodies.

Before a cataloging project began in 2002 involving catalogers from the UCB Cataloging Department, most of the Mountaineering Collection was accessible chiefly by author or title in a small card file in the Special Collections reading room.[29] The books were arranged on the shelves by author and title. Approximately 300 titles in the collection were accessible in the libraries' online catalog at the time the project began. The provenance evidence in the books was largely unknown, with the exception of a few special examples known to Special Collections personnel. From the beginning of the project, Cataloging Department catalogers followed the established Special Collections practice of examining the materials for provenance evidence. They routinely noted and provided added access points for donors as well as for those who had intellectual responsibility for the materials (for example, authors, illustrators, or photographers) and whose signatures or presentation inscriptions were in the books. For other evidence of former ownership, however, the lead cataloger and Special Collections personnel decided that the efficiency of the project would be

enhanced if the decisions concerning whether to note and trace previous owners were left to the discretion of Special Collections personnel. To facilitate the decision process, the catalogers left queries for Special Collections personnel concerning the provenance evidence they encountered that had no connection to the production of the book.

In many instances in which the catalogers asked whether they should include notes and added entries for former owners, Special Collections personnel were conservative in asking catalogers to go back and augment the bibliographic records. Some evidence of former ownership may be too vague for inclusion, for example, the signature of an unknown Bill Smith in a book published in 1960. As the project progressed, however, the catalogers encountered names of former owners they had already seen in other books in the collection. In consultation with other catalogers and Special Collections personnel, they developed several criteria for noting and tracing provenance they had seen previously in Mountaineering Collection books: (1) the names of the former owners were distinctive; (2) the inscriptions in the books revealed something intriguing or significant about those who had written them; and (3) the names were known to be those with connections to mountaineering, whether local Colorado residents or world-class mountaineers.

One name in particular, Philippa de Courten, recurred often among the books. Her signature was initially difficult to decipher, but the inscription always included the signature, a date, and several other words, now known to be place names in Switzerland. Figure 1 illustrates Philippa de Courten's signature, dated 1945.[30] As more examples became known, the catalogers were able to identify her forename with certainty, but only when they encountered the neatly printed name Félix de Courten were they able to confirm the form of Philippa's surname. A third name, Claire de Courten, also appeared. Over time, the catalogers

discovered that other books were authors' presentation copies to Philippa and occasionally to Félix or Claire.

The decipherment and recurrence of the three distinctive names fit the project's criteria for including provenance information in bibliographic records. As they encountered other books that contained the names of the Courtens, the catalogers created copy-specific notes (in field 590) concerning the provenance information and added entries (in field 700) for each person who had placed evidence of ownership in the book. UCB's practice is to use relator codes instead of relator terms. The added entries for Philippa include the realtor codes "fmo" (former owner), "ins" (inscriber), or "sgn" (signer):

    700 1_ Courten, Philippa de, $4 fmo
    700 1_ Courten, Philippa de, $4 ins
    700 1_ Courten, Philippa de, $4 sgn

Similarly, the added entries for Félix and Claire include appropriate relator codes in $4. All are retrievable in the author index of UCB's online catalog.

The discovery of a disheartening inscription prompted the author, the lead cataloger on the project, to investigate more about the books with provenance of Philippa, Félix, and Claire de Courten. The inscription appeared on the half title of Albert Gos's *Souvenirs d'un peintre de montagne* (figure 2):

    In memory of our
    beloved
    Philippa!
    Villars, [illegible abbreviation] 1947

        her Mummy[31]
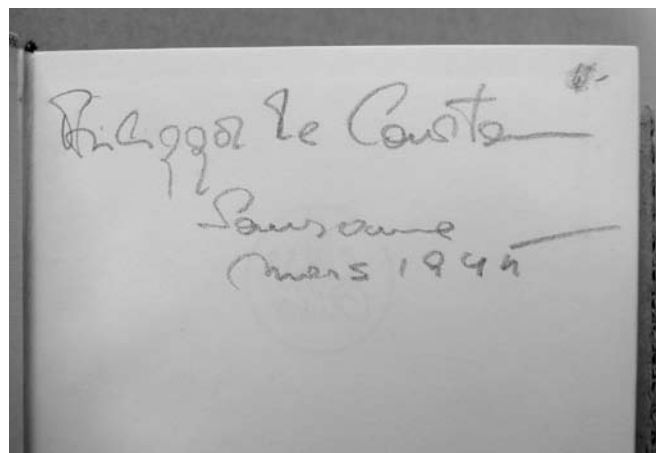
Figure 1. Signature of Philippa de Courten
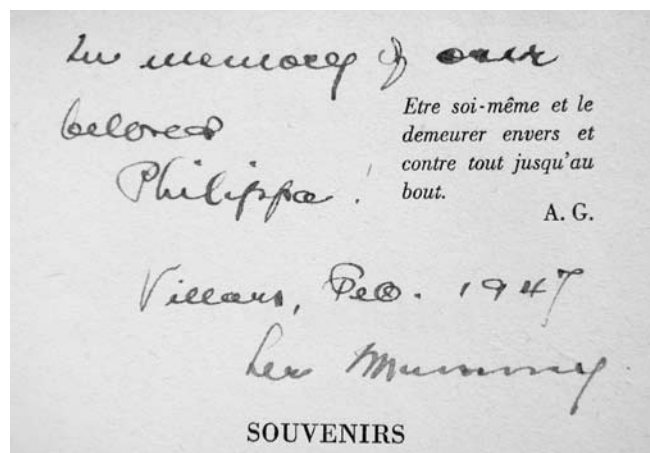
Figure 2. Inscription in the hand of Claire de Courten

Until one of the catalogers encountered this inscription, little could be inferred with certainty about the relationship of Philippa, Félix, and Claire. Even though the Mountaineering Collection cataloging project was still in process, a sufficient number of books had been cataloged with the Courten provenance notes and added entries that the author was able to confirm that this startling inscription was clearly in the hand of Claire de Courten. Other books included author's presentation inscriptions to one or more of the three Courtens. From the presentation inscriptions addressed to Félix and Claire and from inscriptions in Félix's hand on the flyleaves of three books, their relationship became clear. Philippa was the daughter of Félix and Claire.

Three inscriptions written by Félix in Philippa's books reveal the family's serious interest in mountaineering. Two were written on special occasions. The first inscription, on the flyleaf of Luis Trenker's *Meine Berge,* denoted Félix and Claire's present to Philippa on her fourteenth birthday (figure 3):

> Philippa
> von Papi und Mami
> zu ihrem 14. Geburts-
> tage.
> Brixen. den 6. April
> 1 9 x 4 0[32]

Brixen, the place named in Félix's inscription, is an alternate name for Brixen im Thalen, Austria, and is the German form of the Italian city, Bressanone.[33] Trenker's book is about the Alps and is illustrated with many photographs of the Alps.

Almost five years later, *Schweizer Bergführer erzählen,* sent to Philippa on March 26, 1945, while she convalesced in a hospital, contained two inscriptions on the flyleaf, the first in the hand of A. Wyrsch and the second written by Félix:

Figure 3. Presentation inscription in the hand of Félix de Courten

> Gute Genesung
> 26. III. 45.
> A. Wyrsch.
>
> Sent by Mme. Wyrsch
> to the "Hospital Cantonal"
> of Lausanne, where
> Philippa was laid up with
> a leg fracture since March 13, 1945[34]

The first line of the first inscription is a greeting, literally "Good recovery." The book contains a number of biographical narratives about Swiss mountaineering guides. The cause of Philippa's accident is unknown, but less than a year later an inscription in a third book indicates that she anticipated traveling to the Himalayas. On the flyleaf of André Roch's *Karakoram Himalaya: sommets des 7000 m,* which Félix gave to Philippa, he wrote

> To Philippa
> Wishing her many happy
> returns from the Himalaya
> Villars s/Ollon
> Christmas 1945
>
>   Papi[35]

Villars-sur-Ollon is a town in Switzerland.[36]

Fifty books bear a signature or inscription, often dated, in the hand of one of the three members of the Courten family. Claire's signature or its surrogate ("Mummy") appears in four books, Félix signed or inscribed twelve books, and Philippa signed her name, date, and place in thirty-four books. In addition to her signature, Philippa often quoted from English, French, and German authors and poets below her signature; some are extensive quotations and fill most of the recto of the flyleaf. Because her handwriting is difficult to decipher, the quotations are often difficult to read. The names of several authors of the texts of the quotations are discernible: Martin Schmid, René Duinton, and William Shakespeare. The language of her own inscriptions and the form of the dates she used in them indicate that Philippa was tri-lingual in English, French, and German. The languages of the text of books from the Courten library suggest that she and her family may also have been fluent in Italian. Many of the books include brief marginalia, primarily in the form of underlined words or sentences and passages marked in the margins. Often the marginalia are written in pencil or blue pencil. Seven other books from the Courten library are authors' presentation copies from five different authors to one or more of the family members. One book bears a note in Félix's hand (quoted above) concerning Philippa's
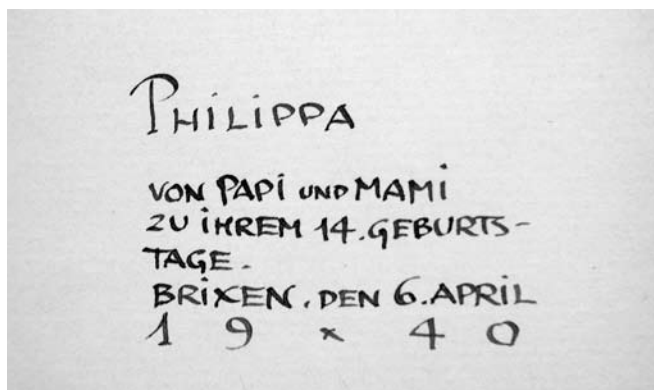
convalescence in a Lausanne hospital and is clearly from the Courten library.

Evidence for other books from the library appeared by chance when one of the Mountaineering Collection catalogers noticed that an accompanying order slip included the name of the dealer from whom the book was acquired in 1987.[37] A search in the Special Collections files produced a copy of the typed list of titles that were purchased from the dealer, with a total of ninety-two entries for both monographic and serial publications. Not all of the books on the list can be identified as belonging to the Courten family. Those that do bear some identified Courten provenance evidence contain similar marginalia, underlined words, or passages marked in pencil. Many of the books with Philippa's name in them have a penciled number followed by a right parenthesis, for example, "34)."[38] Only three books (two of which are copies of the same title) containing penciled numbers on the front endpaper lack Philippa's signature or a presentation statement to her. From the evidence of the distinctive penciled numbers, the cataloger safely concluded that the books were from her library and added the note and added entry to the bibliographic records.[39] The penciled numbers range from 1 to 90, but only thirty-two of the books in the collection contain those numbers. A total of fifty-nine books have been identified in the UCB Special Collections Mountaineering Collection as formerly belonging to the Courten family and are represented by copy-specific notes and added entries for one or more of the family members. Searches in the UCB online catalog for each of the three names retrieve eleven entries for Claire, sixteen for Félix, and forty-one for Philippa. Because some bibliographic records have associations for more than one person, the total number of entries is greater than the fifty-nine titles from the Courten family.

Although the purpose of this paper is not to present historical research on the Courten family, the temptation has been great to seek more information about them. The internal provenance evidence in the books themselves, in the inscriptions quoted above, indicates that Philippa was born on April 6, 1926, and her death occurred sometime in 1947 or before. Her last dated signature in one of her books is June 1946.[40] The book is in its original wrappers (that is, it is paper bound) and has not been read past page 44, for the remaining pages are uncut. Philippa must have been only twenty or twenty-one when she died. A search in some of the historical newspapers online revealed a brief notice concerning Philippa's death in the *Times*. The notice, written by a correspondent in Zermatt and dated September 8, 1946, reported that Philippa and her guide had fallen to their deaths as they attempted a new route on the Engelhorn in the Bernese Oberland Alps. The reporter mentioned that Philippa was an accomplished Alpinist and a ski champion.[41]

Another report in the *Chicago Daily Tribune* on March 21, 1955, mentioned the visit to Chicago of Count Félix René de Courten and his wife, the former Clara Bartholomay, who was born in Chicago. The Courtens had traveled from Villars-sur-Ollon near Lausanne, Switzerland.[42] Although there is a discrepancy in the names of Clara and Claire, the names are very close, and Claire's inscription, quoted above, is in English. The internal and external evidence lead to the conclusion that Philippa's mother, Claire, was American. A Google search on Philippa's name retrieved an entry in a database of Swiss artists. The brief entry gives her birth date as April 6, 1926, in Munich, and her death date as September 5, 1946, in Meiringen, and the media in which she worked as painting and watercolor.[43] The discovery that Philippa was an artist makes even more poignant the title of the book that Claire inscribed in memory of Philippa (as quoted above)—Gos's *Souvenirs d'un peintre de montagne.* Conducting further research into the intriguing topic of the history of the Courten family is left for others to pursue, but the catalogers of the books have created the first step to identifying the owners of the books.

The provenance added entries in Chinook, the UCB online catalog, have given a means of accessing this small but collectively remarkable group of books from a family living in Switzerland in the mid-twentieth century whose lives were intimately involved with mountaineering and who knew a number of authors of mountaineering books, particularly about the Alps. The Courten books revealed something of their history and that of the family who owned them. The evidence in the books could be recognized and included in the bibliographic records for several reasons:

- Special Ccollections personnel decided to acknowledge former ownership in its bibliographic records even for materials that are not especially rare.
- The procedures for the project instructed catalogers to notify Special Collections personnel when they encountered autographs or inscriptions of former owners.
- Special Collections personnel initially decided on a case-by-case basis whether to note and trace provenance, but when evidence recurred, criteria were established to allow the catalogers to include notes and add entries into their cataloging records.
- Through careful attention, the catalogers recognized a recurring, difficult-to-decipher signature.

If, by chance, the books had been destined for the UCB general stacks, the provenance for the Courten family would almost certainly have received no attention in the cataloging records. Inclusion of such copy-specific information is not expected of catalogers for the general collections. In such a case, the Courten provenance would have been lost.

Conclusion

More than twenty years ago, the forethoughtful efforts of rare book librarians and catalogers to recommend standards to encompass treatment of the special characteristics of rare books led to the development and revision of those standards. Many catalogers have adhered to both national standards and local interpretations of the standards to develop best practices to inform users of information about materials in special collections beyond the published content of the materials. Provenance and other physical characteristics of books in special collections often prove to be the reasons the books are held in a special collections department. The significance of provenance in other cases may only be discovered when the books are cataloged. The foregoing account of the discovery of information about the former owners of a small group of books illustrates that neither the books nor the former owners have to be rare or famous to make worthwhile the effort of catalogers to record provenance information and make it searchable in bibliographic records. As much as their other physical characteristics, such as bindings, provenance information can open a new area of interest and research. As Oram and Bishop note in their discussion of investigating and relating to books with all our senses, "Most books in special collections have their tales to tell, their sweet smell of provenance."[44] Only by providing an indication of former ownership, even in books that have ordinary texts, can catalogers provide users a means to discover the aspect of provenance in special-collections materials.

References and Notes

1. OED Online, 2nd ed., 1989, http://dictionary.oed.com (accessed Sept. 28, 2007).

2. John Carter, *ABC for Book-Collectors*, 5th ed., rev. (New York: Knopf, 1972), 160.

3. David Pearson, *Provenance Research in Book History: A Handbook* (London: British Library, 1998).

4. Germaine Warkentin, "Sidney Family Library Books," online posting, Exlibris-L, Feb. 20, 2007, http://palimpsest.stanford .edu/byform/mailing-lists/exlibris/2007/02/msg00253.html (accessed Sept. 28, 2007).

5. Paul Shaner Dunkin, *How to Catalog a Rare Book*, 2nd ed., rev. (Chicago: ALA, 1973), 100.

6. Independent Research Libraries Association, Ad Hoc Committee on Standards for Rare Book Cataloguing in Machine-Readable Form, *Proposals for Establishing Standards for the Cataloguing of Rare Books and Specialized Research Materials in Machine-Readable Form* (Worcester, Mass.: Independent Research Libraries Association, 1979), www .rbms.info/committees/bibliographic_standards/committee -docs/irla-1979.html (accessed Sept. 28, 2007).

7. Library of Congress, Office of Descriptive Cataloging Policy, *Bibliographic Description of Rare Books: Rules Formulated under AACR 2 and ISBD(A) for the Descriptive Cataloging of Rare Books and Other Special Printed Materials* (Washington, D.C.: Library of Congress, 1981).

8. *Descriptive Cataloging of Rare Books,* 2nd ed. (Washington, D.C.: Library of Congress, 1991).

9. *Anglo-American Cataloguing Rules*, 2nd ed., 2002 revision, 2005 update (Chicago: ALA, 2005); *ISBD(A): International Standard Bibliographic Description for Older Monographic Publications (Antiquarian),* 2nd rev. ed. (The Hague: International Federation of Library Associations and Institutions, 2001), www.ifla.org/VII/s13/pubs/isbda. htm (accessed Sept. 28, 2007); Association of College and Research Libraries, Rare Books and Manuscripts Section, Bibliographic Standards Committee, *Descriptive Cataloging of Rare Materials (Books)* (Washington, D.C.: Library of Congress, 2007).

10. Joint Steering Committee for Development of RDA, *RDA: Resource Description and Access: Prospectus* (Sept. 28, 2007), www.collectionscanada.ca/jsc/rdaprospectus.html (accessed Sept. 28, 2007); Joint Steering Committee for Revision of AACR, *Minutes of October 2006 Meeting,* www.collections canada.gc.ca/jsc/docs/5m100-128.pdf (accessed Sept. 28, 2007).

11. Library of Congress, Network Development and MARC Standards Office, *MARC 21 Concise Format for Bibliographic Data,* 2006 Concise ed. (Washington, D.C.: Library of Congress, 2006), www.loc.gov/marc/bibliographic (accessed Sept. 28, 2007); OCLC Online Computer Library Center, *Bibliographic Standards and Formats,* 3rd ed. (Dublin, Ohio: OCLC, 2007), www.oclc.org/bibformats/en/default.shtm (accessed Sept. 28, 2007).

12. Library of Congress, Network Development and MARC Standards Office, *MARC 21 Concise Format for Holdings Data,* 2006 Concise ed. (Washington, D.C.: Library of Congress, 2006), www.loc.gov/marc/holdings (accessed Sept. 28, 2007).

13. Association of College and Research Libraries, Standards Committee of Rare Books and Manuscripts Section, *Provenance Evidence: Thesaurus for Use in Rare Book and Special Collections Cataloguing* (Chicago: Association of College and Research Libraries, 1988); *Provenance Evidence Terms* (2007), http://library.osu.edu/sites/users/russell.363/ RBMS%20Thesauri/provenance/alphabetical_list.htm (accessed Sept. 28, 2007).

14. Melissa C. Flannery, "A Review of Recent Developments in Rare Books Cataloging," *Cataloging & Classification Quarterly* 7, no. 1 (1986): 55–62.

15. John B. Thomas III, "The Necessity of Standards in an Automated Environment," *Library Trends* 36, no. 1 (1987): 125–39.

16. Stephen Paul Davis, "Computer Technology as Applied to Rare Book Cataloging," *IFLA Journal* 10, no. 2 (1984): 158–69; Stephen Paul Davis, "Bibliographic Control of Special Collections: Issues and Trends," *Library Trends* 36, no. 1 (1987): 109–24.

17. OCLC Online Computer Library Center, "Status of the Integration of the RLG Union Catalog into WorldCat," www.oclc.org/services/cataloging/rlg/integration_status.htm

(accessed Oct. 3, 2007).

18. Susan A. Adkins, "Automated Cataloging of Rare Books: A Time for Implementation," *Collection Management* 16, no. 1 (1992): 89–102.

19. Karen A. Attar, "Cataloguing Early Children's Books: Demand, Supply and a Seminar," *Catalogue & Index* no. 151 (2004): 8–12.

20. Anna R. Bryan, "Bibliographical Note: Provenance, the Case of the Yorkshire, England Collection," *Rare Books and Manuscripts Librarianship* 13, no. 2 (1999): 129–32.

21. Society for the History of Authorship, Reading and Publishing, "SHARP Web," www.sharpweb.org (accessed Sept. 28, 2007).

22. H. J. Jackson, *Marginalia: Readers Writing in Books* (New Haven: Yale Univ. Pr., 2001). Jackson followed up on her 2000 study in "'Marginal Frivolities': Readers' Notes as Evidence for the History of Reading," *Owners, Annotators, and the Signs of Reading*, Robin Myers, Michael Harris, and Giles Mandelbrote, eds. (New Castle, Del.: Oak Knoll; London: British Library, 2005), 137–51.

23. R. C. Alston, *Books with Manuscript: A Short Title Catalogue of Books with Manuscript Notes in the British Library, Including Books with Manuscript Additions, Proofsheets, Illustrations, Corrections* (London: British Library, 1994).

24. Ronald J. Zboray and Mary Saracino Zboray, *A Handbook for the Study of Book History in the United States* (Washington, D.C.: Library of Congress, 2000).

25. Pearson, *Provenance Research in Book History*, 182–273.

26. Ibid., 317.

27. John Overholt, "MARC for Special Collections Discussion Group minutes—Midwinter 2007," online posting, RBMS mailing list, Feb. 16, 2007, http://lists.ala.org/wws/arc/rbms/2007-02/msg00027.html (accessed Sept. 28, 2007).

28. John Hunt, *The Conquest of Everest,* 1st American ed. (New York: Dutton, 1954).

29. M. Winslow Lundy and Deborah R. Hollis, "Creating Access to Invisible Special Collections: Using Participatory Management to Reduce a Backlog," *The Journal of Academic Librarianship* 30, no. 6 (2004): 466–75.

30. Guido Rey, *Le Mont Cervin,* nouv. éd. (Lausanne: Éditions Spes, 1937), front free endpaper.

31. Albert Gos, *Souvenirs d'un peintre de montagne* (Genève: Jeheber, 1942?), half-title page.

32. Luis Trenker, *Meine Berge: das Bergbuch* (Berlin: T. Knaur, 1939), front free endpaper.

33. National Geospatial-Intelligence Agency, "GEOnet Names Server (GNS): GNS Search," http://gnswww.nga.mil/geonames/GNS/index.jsp (accessed Sept. 28, 2007).

34. *Schweizer Bergführer erzählen*, 3. Aufl. (Zürich: Orell Füssli, 1938), front free endpaper.

35. André Roch, *Karakoram Himalaya: sommets de 7000 m* (Neuchâtel: V. Attinger, 1945), front free endpaper.

36. National Geospatial-Intelligence Agency, "GEOnet Names Server (GNS): GNS Search."

37. University of Colorado at Boulder, University Libraries, Special Collections Department, Mountaineering Collection acquisition files.

38. Sir Alfred Henry Moore Lunn, *Les montagnes de ma jeunesse*, trad. par Claire-Eliane Engel (Neuchâtel: Victor Attinger, 1943), front pastedown endpaper.

39. Luis Trenker, *Berge und Heimat* (Berlin: T. Knaur, 1939), front pastedown endpaper; Hans Franz, *Der Mensch am Berg* (München: F. Bruckmann, 1935), front pastedown endpaper of each of two copies.

40. Jacques Boell, *Oisans* (Paris: J. Susse, 1945), front free endpaper.

41. "Woman Killed on Engelhorn," *Times* (London), Sept. 9, 1946. Times Digital Archive, 1785–1985 [proprietary database], http://web7.infotrac.galegroup.com/itw/informark (accessed Sept. 28, 2007).

42. Judith Cass, "Two Benefits in May Planned in Suburbs: Here and There," *Chicago Daily Tribune*, Mar. 21, 1955. ProQuest Historical Newspapers Chicago Tribune (1849–1985) [proprietary database], http://proquest.umi.com (accessed Nov. 28, 2005).

43. Schweizerisches Institut für Kunstwissenschaft, "SIKART Lexikon und Datenbank" (Zürich: Schweizerisches Institut für Kunstwissenschaft, 2006), www.sikart.ch/page.php?pid=4&recnr=4024565 (accessed Sept. 28, 2007). The print version of the entry can be found in *Biografisches Lexikon der Schweizer Kunst: unter Einschluss des Fürstentums Liechtenstein*, herausgeber, Schweizerisches Institut für Kunstwissenschaft Zürich und Lausanne (Zürich: Verlag Neue Zürcher Zeitung, 1998), 1:238.

44. Richard W. Oram and Edward L. Bishop, "The Sweet Smell of Provenance," *Chronicle of Higher Education* 52, no. 6 (2005): B18, http://chronicle.com/weekly/v52/i06/06b01801.htm (accessed Sept. 28, 2007).

A Model for Assessing Digital Image Use and Needs

Report of a Study into Digital Image Use in North American Dental Education

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This study is presented as one possible model for assessing image use and needs that can inform planning for and creation of a digital image repository. The study described here specifically sought to provide basic knowledge about the current use of digital images in North American dental schools, as well as what future needs might occur among digital image users. It was conducted as part of an ongoing needs assessment for possible construction of an online repository of digitized dental images. The research team conducted semistructured interviews with a purposive sample of dental faculty members at a representative dental school, as well as a brief survey of academic deans. Findings indicated use of digital dental images is nearly ubiquitous among faculty members, but that not all of their needs are being met. The faculty members would benefit from access to an online repository of high-quality digital dental images with accompanying metadata.

Many institutions and disciplines are exploring the creation of digital image repositories. The research project described here investigates questions pertinent to most types of digital image repositories—namely, the needs that drive image use, whether these needs can be met through an online repository, the functional elements that image users would be most helpful, and whether individuals would be willing to contribute images to a shared repository. The process followed in conducting the research reported in this paper can be applied to research into other types of discipline-based image repositories.

The needs assessment described in this paper was prompted by the presence at the University at Buffalo's (UB) School of Dental Medicine of a collection of high-quality dental slides donated by a retired faculty member to be made available to the educational community. The extensive collection includes slides that could be professionally digitized and made available online as the core of a repository of digital dental images. The collection is currently in physical form.

Rather than simply making the images available within the school, the research team decided to assess the feasibility of making the images available to the broader community of dental faculty members and researchers. This needs assessment was designed to determine the image-related needs of dental faculty members and to

determine whether an online repository of digitized dental images could meet any needs discovered during the study.

To provide basic knowledge about dental-image use by faculty members at North American dental schools, and how efforts to provide an online repository of digitized dental images might help the work of those faculty members, this study asked the following research questions:

RQ1: What needs drive digital image use by dental faculty members?

RQ2: Can the respondents' needs be met by the creation of an online repository of digitized dental images?

RQ3: What functional elements of the proposed online repository of digitized dental images would be most helpful to users?

RQ4: Would members of the larger dental community be willing to contribute further material to the proposed online repository of digitized dental images?

The research team conducted the needs assessment in three stages. In the first stage, members of the research team conducted semistructured interviews with dental faculty members at the UB School of Dental Medicine. The second stage involved a brief national survey of academic deans from North American dental schools. The third stage involved a longer national survey of dental faculty members from North American dental schools.

Background

While several articles have addressed the use, or potential use, of images in dental practice, little is documented about the content and types of images needed or how they are collected, stored, and retrieved by dental professionals, faculty, researchers, and students.[1] This basic knowledge is necessary for establishing the context into which a repository of digitized dental images might be introduced.

As use of computing and imaging technology continues to move forward, dental schools continue to train faculty and students to use computing technology. According to a 2002 literature review performed by Hendricson of the San Antonio Health Sciences Center, 558 English-language articles from 1996 through 2002 were published addressing some aspect of computer-assisted instruction in the health professions.[2] A companion piece published by Hendricson and colleagues found that 86 percent of North American dental schools have already expanded their use of information technology as part of their curricula, with 82 percent hoping to increase IT use further.[3]

Many dental faculty and practicing dentists throughout North America have amassed large collections of images over their years in the field. These images exist in many forms: digital, plastic and glass slides, and video tape, for example. While most faculty use their own collections daily, many do not have an easy way to share their collections with others, or to make use of the collections of others. Dental practitioners are also using computers extensively in their offices. According to Schleyer and his colleagues, only 1 percent of dentists used computers in their offices in 1976, but this had changed by 2000, when "85.1% of all dentists in the United States used a computer in the office."[4] While discussing the patient-dentist experience in a technologically equipped office, Feuerstein pointed to digital photography and radiology as tools to enhance the visual clinical examination and patient consultation.[5] In an article exploring the role of IT in the dentist-patient relationship, Kirshner noted that "digital imaging may have the most profound effect on the dentist-patient relationship, due to its immediacy and ease of understanding through recognizable visualizations."[6]

Casual sharing of images is unlikely to have the effect that an organized repository could have. Fortunately, the infrastructure already exists for the delivery of high-quality medical images and appropriate metadata in the form of the Health Education Assets Library (HEAL, www.healcentral.org). The research team has been in contact with staff members at HEAL, and the inclusion in HEAL of the images from the UB School of Dental Medicine donated collection is feasible, pending funding. Part of the planning process includes producing standards-compliant metadata that can be cross-referenced with HEAL metadata. This paper, however, focuses on establishing basic needs on the part of dental faculty members and researchers.

Research Method

The semistructured interviews in the first stage were meant to elicit detailed information about the use of images in the working lives of dental faculty members. The sample for this part of the study was a purposive sample for heterogeneity. The interview respondents worked in a variety of dental specialties, including several respondents who worked in allied health specialties and taught within the School of Dental of Medicine. The questions that were used to guide the interviews are presented in appendix A.

Semistructured interviews were appropriate for the first stage of the needs assessment because they allow an interviewer to cover a list of important topics, but also allow for exploration of unanticipated themes during the interviews.[7] Thus the interviewers could cover planned questions such as whether interview respondents preferred digital or nondigital images, as well as unanticipated questions about reasons the interview respondents had for using particular types of images. This was an appropriate approach for a

study designed in part to establish baseline knowledge in an area where there is considerable anecdotal knowledge but a relative paucity of empirical studies. A total of 16 semistructured interviews were conducted as part of the study. The respondents were numbered R01–R16 to protect their confidentiality.

Members of the research team used content analysis to sort the interview respondents' statements on the basis of whether the statements referred to one of three types of image use:

1. General image use; that is, the form of the image (digital or nondigital) was not specified
2. Use of digital images
3. Use of nondigital images

Within each category, the coders further grouped the statements on the basis of whether each statement referred to a prompt (a positive factor that motivated use of a particular type of image—for example, the ability to manipulate digitized images), or a hindrance (a negative factor that provided motivation to not use a particular image type—for example, the need to develop film for physical slides). A Description category was used for statements that named an image type without elaboration. But the Prompt and Hindrance categories will remain the focus here.

Because multiple members of the research team participated in the content analytic coding of the interview statements, chance agreement represented a threat to the validity of the results of that analysis. For example, in deciding whether each statement should be grouped under Prompt or Hindrance within each image type, random chance could lead to a deceptively high level of agreement. To counter this possibility, the results of the content analysis were checked using Cohen's Kappa, a statistical measure of inter-rater reliability and a commonly used check against chance agreement.[8] An accepted set of criteria for interpreting Cohen's Kappa sets greater than .67 as the threshold for allowing preliminary conclusions, and greater than .80 as the threshold for indicating good reliability.[9] In all cases, the scores for Cohen's Kappa exceeded the .80 threshold, establishing good reliability for both content-analysis schemes (sorting the statements by the resource type to which each statement referred, and by Prompt, Hindrance, or Description).

The survey of academic deans performed for the second stage of the needs assessment was meant to provide context and validation for the semistructured interviews. Along with the risks to validity mentioned above, there was additional risk inherent in drawing all of the interview respondents from a single dental faculty. To reduce this risk, the team members decided to conduct a brief e-mail survey (see appendix B) of academic deans at North American dental schools to provide at least a preliminary determination about whether the experiences described by the respondents at the UB School of Dental Medicine validly reflected the experience of dental faculty members elsewhere. Respondents for the e-mail survey of academic deans in the current study were recruited through an electronic discussion group that reached the academic deans of North American dental schools. In the survey, 18 of 56 academic deans responded, for a response rate of 32 percent.

The longer survey (appendix C) for the third stage of the needs analysis was meant to provide additional validation for the basic needs found in the first two stages and to begin determining the suitability of potential metadata elements for use in the proposed online repository of digitized dental images. The third-stage survey also sought to begin determining whether members of the larger dental community would be willing to contribute material to the proposed repository.

Two rounds of e-mail invitations were sent to potential respondents. The first round of invitations went out to 536 potential respondents from the American Dental Education Association's list of department chairs. A total of 78 messages failed for various reasons, for a total of 458 successful messages. In the second round, a slightly smaller number of messages (528) were sent. The smaller number resulted from the removal of known incorrect addresses. A total of 43 messages failed for various reasons, for a total of 485 successful messages.

Sixty-seven individuals responded to the survey. Basing the response rate conservatively on the larger group of messages (485) yields a response rate of 14 percent. This is somewhat lower than average, but not completely out of line with a reported response rate to Web surveys of just under 21 percent when all invitations are sent by e-mail.[10]

Results

RQ1: What Needs Drive Digital image Use by Dental Faculty Members?

Virtually all of the interview respondents (15 of 16) used dental images in their work. The one respondent who did not use dental images made use of nondental images. The interview respondents showed a strong overall preference for digital images. Table 1 shows a breakdown by resource type of how many statements the respondents made that referred to Prompts or Hindrances in their use of each resource. For example, the respondents made 92 statements that referred to prompts for image use and 31 statements that referred to hindrances to image use, for a ratio of 2.97 statements that referred to a prompt to each statement that referred to a hindrance. Statements that contained simple descrip-

tions of resources used (coded under Description) were not included here because, by definition, those statements did not tell anything about the prompts or hindrances encountered by the respondents in their use of each resource type. The descriptive statements were used to establish context during the course of the study, and constituted less than 11 percent of the total statements.

Table 1. Frequency and ratio of prompts and hindrances for image use

Resource	Prompt	Hindrance	P:H
Image	92	31	2.97
Digital Image	186	83	2.24
Nondigital Image	9	10	0.90
Total	614	319	1.92

The relatively high number of statements referring to digital images, along with the strong preponderance of prompts to hindrances in using those images, demonstrate the relatively high regard the respondents had for digital images compared to nondigital images. Nondigital images constituted the only resource type with a negative ratio of statements about prompts to statements about hindrances. References to image use that did not specify the type of image (digital or nondigital) also contained a strong preponderance of references to prompts over hindrances, reinforcing the idea that general image use is very common among dental faculty members.

The images met a number of needs on the part of the faculty members. Classroom use of images accounted for a very significant portion of the prompts mentioned. Other prompts included the comparison of healthy and diseased tissue, and the illustration of how a condition might develop. R02 indicated that image use can allow an instructor to show "the etiology, the root cause of the problem." Other prompts for image use included "patient education" and use in journal articles and book chapters (R15). Image quality was also a concern for the respondents. They were concerned with factors such as "true representation of colors and contrast" because, for example, "you want it to be an accurate representation of what the students may encounter in the clinic in the live state" (R01).

The hindrances described by the respondents substantially mirrored the prompts. For example, the respondents expressed concern with the availability of a full range of images. R05 indicated that "If we're trying to illustrate a type of cancer or something, and we want to see the microscopy of it or the histology of it, it may not readily be available."

The patterns of prompts and hindrances in the use of digital images followed a similar pattern. But there were differences. Some of the respondents pointed to purely practical problems. R02 mentioned that digital images were "much [more] convenient, because then you don't worry about carrying slides." The ability to edit digital slides also played a role in the respondents' use of digital images. R03 pointed out that "you can revise them," and "you can add text." Such operations would be more difficult, or impractical, with nondigital slides. Variety also played a role with digital image use. R07 indicated that "If you look at any one atlas there may be one or two pictures of a certain condition, so it may be helpful to be able to look at more pictures of a condition to then to try to match it to something that you're looking at."

The hindrances with digital images also mirrored the prompts. A comment by R06 summed up one of the problems well:

> We need more [images]. Because a lot [of] times what I'll get, is for example, if I want to show them a gum disease, I'll go the textbook on the DVD and a lot of them, the images are not in color in the textbooks. You'll find some textbooks have all color plates and you can use those but usually you can only get one example of the disease so you can't show students the range of what the disease could look like. So if we had more appropriate images it would be better because we could show students the range of what how diseases look.

General image quality was also an issue. R02 indicated that, "With the imaging, I think some of it is, we lose this kind of quality in terms of the depth of the picture." Currency could also affect the perceived quality of the picture, with R01 pointing out that, "If I showed a picture and they have a 1950s hairdo, I'd get an eye roll from the students." The respondents also expressed various technology-related concerns about factors such as the reliability of the technology, and occasional difficulty with image manipulation. For example, R01 indicated that image quality sometimes suffered when the image was projected for a group of students: "The only shortcoming when I move it [a digital image] to PowerPoint is that it may look good on my screen, but it doesn't always project the same way."

As mentioned earlier, nondigital images constituted the only resource category in which the respondents made more statements that mentioned hindrances than statements that mentioned prompts. The respondents also made fewer statements grouped into this category, by far, than the other categories. Only 19 total statements addressed prompts and hindrances to the use of nondigital images. In contrast, the interview respondents made 123 statements referring to prompts and hindrances to general image use, and 269

statements referring to prompts and hindrances to digital image use (see table 1).

Image quality was one prompt to the use of nondigital images mentioned during the interviews. R09 possessed an intra-oral camera that yielded images that were superior in quality to images taken with a digital camera: "With the intra-oral camera, it's designed for close shots, and I think . . . the lens is far superior." Purely practical considerations also played a role. R01 indicated that nondigital slides acted as a substitute: "Only when I'm caught really short, or I need to [find] something quickly, would I show the [non-digital] slides."

Lack of physical slide projectors presented one of the main hindrances to the use of nondigital images. R02, for example, retained nondigital slides but did not use them: "Now it is inconvenient to use it [nondigital slides], because there is no more machines, but I have physical [slides]." The traditional film cameras, despite better image quality when compared to digital cameras, also brought inconveniences. R09 pointed to the inconvenience of having to develop film: "But then it's [the nondigital camera] always a ways away between getting the film developed, and then getting it on to the computer." The difficulty of altering or editing nondigital slides was also mentioned.

In general, the number of statements regarding digital and nondigital images and the proportions of Prompts and Hindrances described by respondents in those statements, indicated a strong preference of the faculty members for digital over nondigital images. The preference was so strong that at least one respondent was willing to sacrifice a reasonable amount of desired quality to gain other conveniences afforded by digital images.

The results from the survey of academic deans tended to reinforce the results from the semistructured interviews. All 18 of the survey respondents indicated that faculty members at their institutions used digital images. The academic deans indicated that their faculty members gathered images from the Internet, personal collections, digital journal articles and textbooks, and from commercial products on CD and DVD (see figure 1). (No respondents chose digital journal articles as a source for images, so that choice was omitted from figure 1.) This pattern of use clearly demonstrates the desirability of digital delivery of images. For example, even though all but one of the deans indicated that faculty members at his or her institution used images from personal collections, two thirds (12 of 18) also indicated that faculty members looked for free images on the Internet, and slightly more (13 of 18) looked for images on commercial DVDs or CDs. The use of commercial products, and the problems with image quality and variety that accompany that use, underlines the need for royalty-free images.

The respondents in the longer national survey also demonstrated a lack of satisfaction with their current access to dental images. Table 2 shows that among the respondents who indicated their level of satisfaction with the current access to dental images, none indicated complete satisfaction. A significant minority expressed an outright lack of access to all the images they needed.
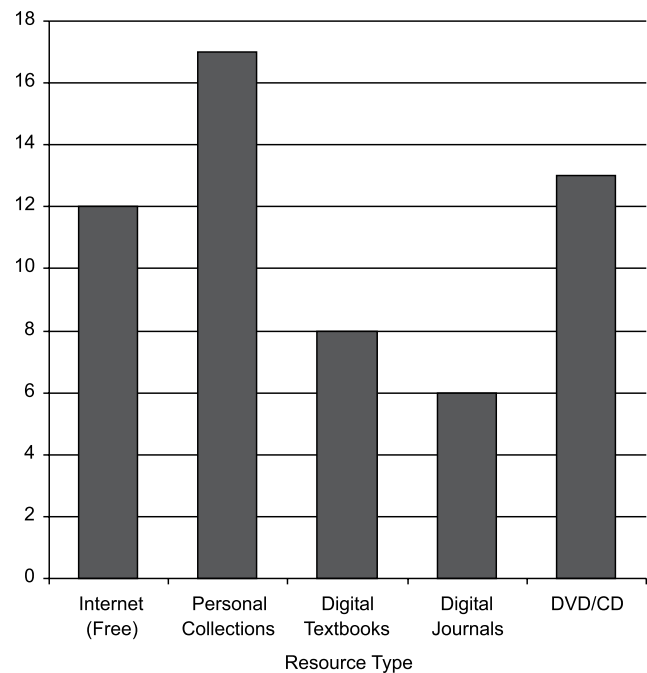
Figure 1. Sources of images

To summarize, the needs expressed by the respondents fell into three basic groups, all of which could be at least partially addressed by creation of a repository of digitized dental images:

1. Image Quality
2. Variety of Images
3. Image Cost and Intellectual Property

Table 2. Access to images

Please choose the item which best describes your use of images similar to the samples you saw on the previous page (*N*=50)	N	%
I have access to all the images I need	0	0
I have access to all the images I need, but having access to more images would be useful	30	60
I do not have access to all the images I need	20	40

RQ2: Can The Respondents' Needs Be Met by the Creation of an Online Repository of Digitized Dental Images?

Despite already having access to dental images, the faculty members still experienced the needs listed in the previous section. The creation of a repository of digital dental images could at least partially meet those needs.

Image Quality

A number of the interview respondents indicated a need for higher-quality images. For example, R15 indicated that, "Sometimes the pixel range is such that you can't enlarge them as you'd like," and that at times "color quality" also hindered the use of digital images. R14 pointed to a similar problem: "If you take a low-resolution image off of one of these web sites, and I then I take it to where I give the lecture, . . . that lack of resolution is magnified." The respondents also confessed to lack of technical expertise in some cases. For example, R08 said, "I'm not really well-versed in say, Adobe Photoshop, or things like that." Professional digitization of the images in the school's collection could address this need directly. Professionally digitized images based on the physical slides could be produced at high resolution and color quality, reducing the need to alter the images and making the alterations less significant when they are needed—for example, simple cropping rather than color adjustment.

Variety of Images

Another set of problems that could be addressed through the construction of an online repository of digitized dental images have to do with a desire on the part of some of the dental faculty members for a greater variety of images. When asked about the variety of available images, R08 answered, "There is a lot out there, I could be satisfied but I would like to see more diversity." The images in the school's collection depict a range of tissue from the maxillofacial region, in healthy condition as well as in diseased or damaged condition. The conditions depicted are commonly addressed in dental education, and would add to the variety of images available to dental educators and researchers. In addition, all eighteen of the deans indicated that their faculty members would benefit from access to high-quality digital images available royalty-free on the Internet.

Image Cost and Intellectual Property

R16 pointed to difficulties with image ownership and intellectual property:

Multiple images, if there were some color atlases available that one could maybe draw some out. But there are only so many atlases, many times you do a search and you find that there is an atlas . . . at a web site or someone is selling and maybe it's $250 and they may have one or two pictures but you can't copy the pictures often from the web site. I mean sometimes you can but often you really can't and even if you're copying it is that really legal?

In addition to copyright issues, the interview respondents also pointed to concerns about gaining permission to use the images they already possessed. For example, R01 indicated that "I have quite a few images that I don't have the patients' permission that would now be required." The school's collection would be made available through a Creative Commons license (http://creativecommons.org) that would allow royalty-free image use for educational purposes. The license would also allow alteration of the pictures. HEAL currently makes its contents available through a Creative Commons license, so there would be no intellectual property barriers to inclusion of the school's collection.

The results from the larger national survey also indicated that dental faculty members would make use of an online repository of digitized dental images. As indicated in table 3, when asked whether they would be likely to use such a repository, a very large majority of the respondents to the question indicated that they would.

The longer national survey also demonstrated that the digitized dental images would be used for a variety of purposes. Table 4 lists the purposes for which the respondents

Table 3. Likelihood of repository use

Likelihood of Use (*N*=47)	N	%
Very likely	28	59.6
Somewhat likely	17	36.2
Somewhat unlikely	2	4.3
Very unlikely	0	0

Table 4. Purposes for which respondents used images

(*N*=52)	N	%
Teaching	50	96.2
Diagnosis	13	25
Research	7	13.5
Clinical consultations with patients	17	32.5

used dental images. The respondent could choose more than one purpose, so the percentages add to more than one hundred. Teaching predominated among the types of image use, but substantial minorities of respondents also used dental images for other purposes.

RQ3: What Functional Elements of the Proposed Online Repository of Digitized Dental Images Would Be Most Helpful to Users?

The longer national survey included questions that asked respondents to rate, on a five-point Likert scale, the usefulness of potential image characteristics and accompanying material, and potential metadata elements. Table 5 shows the respondents' rating of particular image characteristics and accompanying material. The list was built inductively on the basis of the earlier semistructured interviews and discussions with colleagues in the BA School of Dental Medicine. All of the items received a score of at least four, with the images of diseased or damaged tissues receiving the highest scores. But the scores for the potential accompanying materials were nearly as high, lagging by small fractions of a point.

Table 5. Ratings of potential image characteristics

5=most useful, 1=least useful	N	Mean
Images of healthy tissue	49	4
Images of diseased tissue	50	4.72
Images of injured or damaged tissue	50	4.54
Before, during, and after sequences to depict healthy tissue, diseased or damaged tissue, and healed tissue	50	4.62
Case studies, when available, to accompany images	49	4.67
Case information (patient age, gender, race/ethnicity, etc.) when available, to accompany images	49	4.51
Annotations, when available, to provide information such as the area of the maxillofacial region or the name of a disease or injury depicted in the image	50	4.52
Image files of sufficient quality and size so that they can be manipulated by cropping, color adjustment, etc.	49	4.57
Multiple images to depict various views of manifestations of the same tissue, disease, or injury, rather than a single image	50	4.36

The respondents were asked a similar set of questions about potential metadata elements. Table 6 shows the results. Various forms of textual descriptions garnered the highest scores, and subject descriptors garnered the lowest

Table 6. Ratings of potential metadata elements

5=most useful, 1=least useful	N	Mean
Textual description of the location in the maxillofacial region depicted in the picture	47	4.09
Clickable map or maps in the maxillofacial region to indicate the anatomical area depicted in the image	47	3.72
Textual description of tissue depicted in the image (e.g., lips, gums)	47	3.87
Textual description of the color of diseased tissue depicted in the image (e.g., color of lesion)	46	3.63
Clickable color palette to indicate the color of diseased tissue depicted in the image (e.g., color of lesion)	47	3.34
Textual description of a disease depicted in the image	47	4.13
Textual description of the disease stage depicted in the image	47	4.17
Textual description of damage to the tissue depicted in the image	47	4.09
SNODENT descriptor	28	3.14
MeSH descriptor	32	3.25

scores. It is worth noting, though, that the subject descriptors received scores in the middle of the scale, suggesting that they might have some positive value to the respondents.

RQ4: Would Members of the Larger Dental Community Be Willing to Contribute Further Material to the Proposed Online Repository of Digitized Dental Images?

The longer national survey included a question about whether respondents would be willing to contribute images and accompanying material to the proposed online repository of digitized dental images. Table 6 shows the results. Very few respondents indicated a complete unwillingness to contribute to the proposed repository. A very large majority indicated either a current willingness to contribute or a potential willingness to contribute material given further information.

Conclusions

The results from both the interviews and the survey make it clear that use of dental images is nearly ubiquitous among dental faculty members. This reinforces anecdotal impressions of teaching activity in the field, and makes it clear that image use by dental faculty members should be considered a key element in planning for dental education. The interview respondents strongly preferred digital to nondigital images. Digital images were more convenient to use and custom-

ize, and minor compromises in image quality did not affect the interview respondents' overall use of, or preference for, digital images. But not all of the faculty members' current needs are being met. The unmet needs fell into three basic areas: image quality, variety of images, and image cost and intellectual property.

The faculty members expressed a desire for higher quality images that would allow for easier and more effective manipulation of the images (for example, by increasing their size for projection or viewing small sections of an image close up), for a greater variety in the images available, and for images that were freely available for educational and research use. All of these needs can be met at least partially by professionally digitizing the school's slides and making them available online under a Creative Commons license. The academic deans who responded to the survey also indicated that an online repository of digitized dental images would be useful for faculty members at their institutions. Fortunately, the infrastructure for accomplishing this already exists at HEAL, and HEAL has shown preliminary willingness to include the school's collection.

The respondents indicated a strong desire for a collection of diverse, high-quality images accompanied by supporting material such as annotations or case studies. Those needs could be at least partially met by an online repository of digitized images accompanied by relevant supporting materials such as annotations or case studies. The donated collection at the UB School of Dentistry currently contains only slides without annotations or case studies, but the information about potential metadata elements would be useful in planning the addition of annotations as part of the digitization project.

The respondents indicated a willingness to contribute both images and accompanying material, although the willingness was tempered by a desire for more information. Only a very small number of respondents gave an outright negative response. Providing clear rights based on a Creative Commons license may address at least some of the concerns expressed by respondents who wanted more information.

This needs assessment found a variety of unmet, image-related needs on the part of dental faculty members and researchers at North American dental schools. The alloca-tion of resources to an online repository of digitized dental images could provide a significant aid to those faculty members and researchers by providing a wider variety of high-quality, manipulable, legal-to-use images that could enhance their established teaching efforts. The infrastructure for the delivery of the images already exists at HEAL, and the images from the school's collection can be effectively incorporated into that existing infrastructure.

The needs assessment also helped determine a preliminary set of potential metadata elements and accompanying material to go with the images. The donated collection at the UB School of Dentistry currently includes images only, but external funding would make annotations feasible, and even without funding simple annotations could also be added as part of the digitization process through brief labels for the digitized images.

The research team also hoped that the university's collection could act as a kernel for a larger collection. The preliminary indications are positive, and provide evidence that a pool of faculty and researcher contributors exists.

The multistage needs assessment described in this paper was subject to several limitations. The sample size, even for the longer survey, was relatively small. In addition, there was attrition on individual questions. But it is unlikely that the needs expressed were unique to the respondents. Image quality, rights to use images, and image variety are likely to be common problems in dental education, and other professions as well.

The current lack of annotations in the donated collection is a negative factor, but the simple presence of high-quality images of diseased, injured, and healthy tissue was also important to the respondents. External funding for extensive annotation would be extremely helpful, but simple labels provided during the digitization process would suffice to start the collection.

At a minimum, this needs assessment established that there is an appreciable body of dental faculty members and researchers whose image-related needs could be at least partially met through the establishment of an online repository of digitized dental images.

While the research project described in this paper had a very specific focus—assessing digital image use and needs in

Table 7. Willingness to contribute to repository

47 responses to each question	Images		Annotations		Case Studies	
	N	%	N	%	N	%
Yes	24	51.1	18	38.3	18	38.3
No	0	0	2	4.3	1	2.1
Maybe, but I would need more information before deciding	23	48.9	27	57.4	28	59.6

dental education, the process can be applied to understanding digital image use and needs in other fields. Gathering data through a similar process can inform planning for digital repositories of all types.

References

1. Titus K. L. Schleyer et al., "The Technologically Well Equipped Dental Office," *Journal of the American Dental Association* 134, no. 1 (2003): 30–41; Paul Feuerstein, "Can Technology Help Dentists Deliver Better Patient Care?" *Journal of the American Dental Association* 135, suppl. 1 (2004): 11S–16S.
2. William D. Hendricson et al., "Electronic Curriculum Implementation at North American Dental Schools," *Journal of Dental Education* 68 (2004): 1042.
3. William D. Hendricson et al., "What Do Dental Students Think About Mandatory Laptop Programs?" *Journal of Dental Education* 70, no. 5 (2006): 481.
4. Schleyer et al., "The Technologically Well Equipped Dental Office," 30.
5. Feuerstein, "Can Technology Help Dentists Deliver Better Patient Care?"
6. Michael Kirshner, "The Role of Information Technology and Informatics Research in the Dentist-Patient Relationship," *Advances in Dental Research* 17 (2003), http://adr.iadrjournals.org/cgi/content/full/17/1/77 (accessed Oct. 1, 2007).
7. Steinar Kvale, *Interviews: An Introduction to Qualitative Research Interviewing* (Thousand Oaks, Calif.: Sage, 1996).
8. Jacob Cohen, "A Coefficient of Agreement for Nominal Scales," *Educational and Psychological Measurement* 20 (1960): 37–46.
9. Jean Carletta, "Assessing Agreement on Classification Tasks: The Kappa Statistic," *Computational Linguistics* 22, no. 2 (1996): 249–54.
10. Michael D. Kaplowitz, Timothy D. Hadlock, and Ralph Levine, "A Comparison of Web and Mail Survey Response Rates," *Public Opinion Quarterly* 68, no. 1 (2004): 94–101.

Appendix A. Instrument for Semistructured Interviews

Part 1: General Use of Digital Resources

1. Please indicate whether you use each of the following resources as part of your professional work:
   _____ Internet search engines, e.g., Google.
   _____ Online dentistry resources owned or maintained by the university.
   _____ Online dentistry resources NOT owned or maintained by the university.
   _____ Online databases, e.g., MedLine.
   _____ Information on CD-ROM or DVD.
   _____ Other, e.g., information delivered to a personal digital assistant (PDA) or other electronic device.
   1a. [For each resource used] Under what circumstance or circumstances do you typically use [resource]?
     1a1. [For each circumstance] Why do you use [resource under circumstance]?
     1a2. Are there any other circumstances under which you use [resource]?
     1a3. Have you experienced any problems or shortcomings with [resource] that hinder your use of [resource] in any way?
     1a3b. [If YES] Can you describe those problems or shortcomings, and how they hinder your use of [resource]?
   1b. [If no resources used] Can you tell me why you choose not to use any of the resources I listed?

Part 2: Use of Dental Images

2. Do you currently make use of the kinds of dental images that I have shown you?
   2a. [If YES] What types of images do you use?
     2a1. [For each type] Under what circumstances do you typically use [type]?
       2a1a. In what form do you usually use [type]?
       2a1b. [For each form] Why do you use [type] in [form]?
     2a2. [For each type and form] Have you experienced any problems or shortcomings with [resource in form x] that hinder your use of [resource] in that form any way?
       2a2a. [If YES] Can you describe those problems or shortcomings, and how they hinder your use of [resource in form x]?
     2a3. Do you have access to the full range of dental images that you would like to use as part of your professional work?
       2a3a. [If NO] Can you tell me what images or kinds of images you currently do not have access to, but would like to have access to?
   2b. [If NO] Can you tell me why you choose not to use the kind of dental images I showed you?

Part 3: General Follow-up

3. Are there other ways in which you use digital resources as part of your professional work that we haven't talked about?
    3a. [If YES] Can you explain what those other way of using digital resources are?
4. Are there other ways in which you use dental images as part of your professional work that we haven't talked about?
    3a. [If YES] Can you explain what those other way of using dental images are?

Appendix B. Survey Sent to Academic Deans

Q1: Do your faculty use digital images to teach dentistry?
        Yes _____ No_____
Q2: If so, what resources provide images for faculty use? Please check all that apply
        A: Internet (free)
        B: Personal Faculty Collections
        C: Subscriptions such as DERWeb
        D: Digital Textbooks
        E: Digital Journal Articles
        F: Commercial DVD/CD (Supplied by companies)
Q3: Do you believe that your faculty would benefit from and utilize a copyright free source of digital images in oral pathology/oral medicine and histology available for desktop delivery via the Internet?
        Yes _____ No_____

Appendix C. Second Survey Instrument

Note: On the list of answers an open circle indicates a radio button, a hollow square indicates a checkbox, and a solid square indicates an item on a list.

I. General Background
[Note: Sample images placed here on Web instrument.]
   A.   Do you make use of images of healthy, diseased, or damaged tissue in the maxillofacial region like the ones shown here?
        ○   YES
        ○   NO [Send user straight to Thank You screen if answer is No.]
   B.   Please choose the item which best describes your use of images similar to the samples you saw on the previous page:
        ○   I have access to all the images I need, and I don't want more.
        ○   I have access to all the images I need, but having access to additional images would be useful.
        ○   I do not have access to all the images I need.
   C.   I use images for the following purposes (choose all that apply):
        1.   Teaching
        2.   Diagnosis
        3.   Research
        4.   Clinical consultations with patients
        5.   Other: _____
   D.   Please choose the option that best describes your professional situation:
        ○   I am a full-time tenure track/tenured faculty member at a dental school.
        ○   I am a full-time clinical faculty member at a dental school.
        ○   I am a part-time clinical faculty member at a dental school.
        ○   Other: _____
II. Image Characteristics
   A.   Please indicate, on a scale of 1–5, how useful each of the following elements would be in your use of the proposed

repository, with 5 being most useful and 1 being least useful. [Radio buttons 5–1 for response]
- Images of healthy tissue. Images of diseased tissue.
- Images of injured or damaged tissue.
- Before, during, and after sequences of images to depict healthy tissue, a disease or injury to that tissue, and healed tissue.
- Case studies, when available, to accompany images in the collection.
- Case information (patient age, gender, race/ethnicity, etc.), when available, to accompany images in the collection.
- Annotations, when available, to provide information such as the area of the maxillofacial region or the name of a disease or injury depicted in an image.
- Image files of sufficient quality and size so that they can be manipulated by cropping, color adjustment, etc.
- Multiple images to depict various views or manifestations of the same tissue, disease, or injury, rather than a single image.
- Other: [Text box for description]

B. The next set of questions asks about *access points* that might be used in the proposed repository of digitized dental images. An access point is any path that you might use to find an image. For example, pointing and clicking on a map of the maxillofacial region to find images depicting tissue in that region, or performing a text search based on annotations accompanying the images, could serve as examples of potential access points.

Please indicate, on a scale of 1–5, how useful each of the following access points would be in your use of the proposed online repository of digitized dental images, with 5 being most useful and 1 being least useful. [Radio buttons 5–1 for response]
- Textual description of the location in the maxillofacial region depicted in the image. Clickable map or maps in the maxillofacial region to indicate the anatomical area depicted in the image.
- Textual description of tissue depicted in the image (e.g., lip, gums).
- Textual description of the color of diseased tissue depicted in the image (e.g., color of lesion).
- Clickable color palette to indicate the color of diseased tissue depicted in the image (e.g., color of lesion).
- Textual description of a disease depicted in the image.
- Textual description of the disease stage depicted in the image.
- Textual description of damage to the tissue depicted in the image.
- SNODENT [Systematized Nomenclature of Dentistry] descriptor.
- MeSH subject heading.
- Other: [Text box for description]

III. Final Questions

A. How likely would you be to make use of an online repository of digitized dental images that would be freely available under a Creative Commons license for research, teaching, and diagnosis?
- ○ Very likely
- ○ Somewhat likely
- ○ Somewhat unlikely
- ○ Very unlikely

B. Would you be willing to contribute images to an online repository of digitized dental images that would be freely available under a Creative Commons license for research, teaching, and diagnosis?
- ○ Yes
- ○ No
- ○ Maybe, but I would need more information before deciding.

C. Would you be willing to contribute annotations to an online repository of digitized dental images that would be freely available under a Creative Commons license for research, teaching, and diagnosis?
- ○ Yes
- ○ No
- ○ Maybe, but I would need more information before deciding.

D. Would you be willing to contribute case studies to an online repository of digitized dental images that would be freely available under a Creative Commons license for research, teaching, and diagnosis?
- ○ Yes
- ○ No
- ○ Maybe, but I would need more information before deciding.

Approaches to Selection, Access, and Collection Development in the Web World

A Case Study with Fugitive Literature

By Karen Schmidt, Wendy Allen Shelburne, and David Steven Vess

Academic and research libraries are well-versed in collecting material from the print world. The present and future collections that are being produced on the Web require urgent attention to acquire, preserve, and provide access to them for future research. Many of the skills that librarians have honed through years of collecting in the print-based world are applicable to digital collection development, but will require ramping up technical skills and actively embracing digital content in current and future collection-development work. This paper reports on an exploratory project that aims to apply existing skills and knowledge to collect materials from the Internet and lay the groundwork for collection development in the future.

In the print world, the acquisition and selection of materials for libraries is a well-defined and well-known system, developed over decades of work in the profession. The bibliographic output is generally controlled, and librarians can rely on their agents or vendors to obtain the books and journals that are required. This system of identifying and procuring known items also translates well into the controlled digital domain of electronic resources—databases, e-books, and e-journals. Likewise, archivists have developed a refined way of identifying and acquiring specialized collections of letters and diaries, memorabilia, and primary literature that form the basis for social and historic research.

A significant and growing shadow world of material of equal importance is exploding on the Internet and now deserves attention. This fugitive literature contains important manifestations of present day social and political history, art, and literature, and primary cultural output. In every way, this literature is contemporary primary source material upon which research in the future will rely. Its existence begs the question of how subject specialists and collection development librarians take the selection and procurement skills already mastered and refine or expand them to address the new and growing population of material on the Web.

The research presented here reflects efforts to understand the challenges of collecting from the Web. The questions this project sought to answer are

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- How can we discover and locate this material?
- How can we associate it with known published material (either in print or electronically) where it might enrich an existing collection?
- How can we modify and transfer the bibliographic principles already existing in the profession to the work of gathering more transitory documents from the Web?

The issues of long-term archiving creating a potentially massive collection, and the provision of adequate metadata to provide access, are corollary questions of equal significance, but are not the primary focus of this research.

Literature Review

A review of literature in collection development includes the standard collection development texts that detail how items are identified, selected, obtained, and processed (cataloged). Bonk and Magrill's *Building Library Collections,* Gorman's *Collection Management for the 21st Century,* and Johnson's *Fundamentals of Collection Development and Management* provide the rubric for acquisition and collection-development activities in most libraries.[1] This historic professional framework enabled a subject-based approach, matching the goals of this project to the standards in our profession. While this traditional library literature helped set the stage, the literature of archives, especially recent research with archiving Web documents, helped us understand current efforts to capture collections on the Web. While not yet a widely embraced area of research, some seminal writings have been produced. Pearce-Moses and Kaczmarek examine the challenges of a state library managing its mandate to collect and provide access to official reports and documents.[2] This article is particularly helpful with highlighting the steps for identifying Web sites, handling acquisition, and addressing metadata and access issues. Other government-centered projects are reflected in articles that describe the work of The National Library of Australia, as well as the collaborative work of many other countries.[3] These articles allude to the challenges of crawling Web pages, suggest specific tools, and address the problems found in saving highly dynamic Web pages, though without offering much procedural detail. Certainly the work that the Library of Congress is undertaking through the National Digital Information Infrastructure and Preservation Program (NDIIPP, www.digitalpreservation.gov/index.html) is of great importance to describing the technical dimensions of capturing and preserving our digital culture and developing a methodology on which substantial aggregations of digital produce can be curated.[4]

With regard to current efforts to capture the literature emerging on the Internet, Brewster Kahle's Internet Archive Wayback Machine (www.archive.org) has provided a noteworthy program for universal crawling and gathering the content of the Web. Libraries can subscribe to the service entitled Archive-It, "to build, manage and search their own Web archive through a user friendly Web application, without requiring any technical expertise or hosting facilities. Subscribers can capture, catalog, and archive their institution's own Web site or build collections from the Web, and then search and browse the collection when complete."[5] The service allows a library to drill down to specified levels of Web pages and specify different time periods for crawls. Some problems are associated with this service, as reported later in this study, but should not diminish the value of this effort, particularly at this moment in time when so few procedures for handling Web content have been established and codified.

Likewise, individual exploratory programs to capture parts of the Internet are occurring in research libraries and archives, but thus far no generalized approach that has been incorporated into regular collection-development work. This area of collection building is largely undefined, full of technical challenges, and of substantial import to our research collections in the future. The existing literature suggests several fruitful avenues are being explored and developed. Findings from expansive programs such as NDIIPP will provide excellent procedural guidelines in the future, as will individual efforts in targeted areas, such as the one represented here. The research laid forth here is yet another building block of this important venture into gathering research material for future generations of scholars.

Research Method

To launch the collecting of fugitive literature, the project team focused on the topic of hate literature primarily emanating from individuals and groups in the Midwest. Any theme might have been chosen to understand how to develop a Web collection; hate literature was selected on the assumption that there might be more unstructured linking among individuals and groups and thus more of a challenge to understanding of the variety of communications, and because the topic has some relevance to special collections already at the University of Illinois at Urbana-Champaign Library. The library includes the papers of Ewing C. Baskette, a lawyer, librarian, and bibliographer. The focus of this special collection is letters and manuscripts dealing with anarchism, freedom of expression, and censorship, among other items. The library also holds a related book collection on censorship and intellectual freedom. The project team reasoned that the hate literature that was gathered could link to and enhance the Baskette collection.

The project team approached collecting in the area of Internet hate literature in the Midwest by developing a bibliographic strategy, much as a subject specialist would do when building a collection in the print world. Searching for and defining hate groups was a complex matter. The focus was on groups that espouse bias, hatred, or violence toward members of a race, ethnicity, religion, gender, sexual orientation, or other designated sector. The scope was narrowed further geographically by focusing on Web sites that appeared to emanate from Illinois or other surrounding Midwestern states (Michigan, Iowa, Missouri, and Indiana).

Knowing that some organizations track and publish lists of hate groups, we decided to use a list of groups maintained by a third party. This might be likened to using a checklist from a publisher, vendor, or library to identify a core collection in print. The most comprehensive list was found in the *Intelligence Report* published by the Southern Poverty Law Center (SPLC.) SPLC is known for its extensive work in identifying and following hate and fringe political and social groups in the United States, and this gave us an excellent platform from which to begin our work. The original list of groups for this project was derived from the SPLC's *Intelligence Report* online resource, "Hate Groups Map," which is updated annually.[6]

In addition to using the SPLC list, we experimented with using search engines such as Google to identify these Web sites and groups, but the search engines did not produce an entirely credible list. While many rely on Google as a finding aid, it was not successful as a bibliographic identification tool for this topic, even when the filter was changed from "moderate filtering" to "do not filter." We had more success with blog aggregators such as technorati (http://technorati.com) to find related sites of interest.

Our review of Web crawling projects being conducted by libraries and archives demonstrated that each project uses different combinations of technology and collecting practices. Most current collecting practices for material on the Web can be categorized in one of three general approaches listed below:

- Web site-specific collecting
- Domain-specific collecting (for example, *uiuc.edu* domain)
- Topic- or subject-specific collecting

We quickly decided that our project must adopt the approach that a deep, comprehensive capture of Web sites created for and used by hate groups was more valuable than a broad shallow capture. We reasoned that a deep collection of Web resources around a common theme would be more valuable to researchers than a broad but shallow collection. Because we were trying to understand and describe a process, we also felt the deeper approach would reveal more

of the opportunities and challenges in Internet-collection development. Additionally, we recognized that specific, themed collection building of online materials might inspire collaborative collection-building initiatives with other libraries and organizations.

An early challenge that we had to address was the lack of a controlled vocabulary for exploring Web sites. This seems like an obvious issue with which to grapple at the beginning of our work, but given the area—hate literature—we chose to explore, we discovered that language was a bigger hurdle to overcome than we originally assumed. For example, we began to stumble on the number "88." Nothing in our individual backgrounds or education helped us readily decipher the meaning of this, but some research revealed that the letter *H* is the eighth letter in the alphabet, and "88" stands for "Heil Hitler" on the sites we were visiting. Lexicon questions are not likely to pose a problem in more mainstream subject areas, but it is advisable to approach this with no preconceived ideas, as collections of digital materials can evolve new semantics. Obviously it is also significant for developing some aspects of the metadata for these collections.

Methods used to collect these Web sites recognized a number of overlapping issues, including researchers' anticipated future expectations, the technology and technical skills needed to gather in these sites, and the time required to collect and preserve them. To have a manageable initial list of Web sites for the project, as previously noted, our focus was originally limited to groups operating within Illinois and surrounding Midwestern states. Using the list of groups from SPLC, in-depth, organized searches were performed in a systematic way using a set of different search engines.

The goal was to locate Web sites that would fall within our parameters, with the hope that an aggregate Web site might be found that would link the groups. Finding the main organizational Web sites was not difficult, but a few had to be uncovered using complex searches involving references found on Web site bulletin boards or e-mail discussion lists. The Search Engine Watch Web site (http://searchenginewatch.com) was useful in guiding us to the best search engines as well as helping us explore advanced search techniques offered by different search engines.

The general fugitive literature-collection protocol that the project team adopted included the following:

1. Begin with the Web sites of groups listed by the SPLC.
2. Capture Illinois and surrounding state-based groups, but be open to expand these geographic limits.
3. Capture a Web site as deeply as possible on a weekly basis.
4. Use open-source tools available online at no cost.
5. Use open-source tools that are user-friendly and require minimum technical skill.

6. Spend approximately ten hours per week in the following activities:
   - Administering crawls
   - Exploring and describing crawls in a log book of crawling activity that helped keep track of Web sites and interrelated groups
   - Linking identifiable collection-development practices to the Web crawling and discovery activities

We evaluated a number of different Web crawlers in preparation for this project, including Heritrix (http://source forge.net/projects/archive-crawler), HTTrack (www.httrack .com), and WebGrabber (www.epicware.com/Webgrabber. html). These tools were evaluated on the following criteria:

- Operating system requirements
- Memory requirements
- Ease of installation
- Ease of use
- Works automatically on schedule
- Original site structure faithfully downloaded

We chose EpicWare's WebGrabber, mainly because we were crawling using a private Mac, and neither Heritrix or HTTrack worked well with the Mac system. We relied on a private computer, as opposed to one owned by the University of Illinois Library, because of limitations in crawling ability on campus computers and concerns about viruses and spam. This did not turn out to be a problem, but because of the subject matter of our collection topic, we erred on the side of caution. WebGrabber is easy for the novice user to use and offers a number of complex functionalities for more experienced users such as downloading limitations, complex filtering capabilities, and the creation of a crawl log for each download preformed. The application's interface (shown in figures 1–3) is a study in simplicity and usability, which we found lacking in other such applications.

We found a disturbing plethora of sites from which to choose. We settled on sites that seemed to have been established for a least a few months; that had some linkage to Illinois, the Midwest, or both; and that offered different challenges through their links, including blogs, bulletins, online games, and printed material. Reflecting the power of the Web to reach across geography, we were challenged to keep a regional scope, but used geography to help us cull through Web sites when the number threatened to overwhelm us. The final selected list of Web site groups consisted of

- New Black Panthers (www.newblackpanther.com)
- Nation of Islam (www.noi.org)
- Jewish Defense League (www.jdl.org)
- Council of Conservative Citizens (www.galilei.com/stl/cofcc)
- American Renaissance (www.chicagoamren.com)
- National Socialist Movement (www.nsm88.com/index2.html)
- Brotherhood of Klans Knights of the Ku Klux Klan (www.knightskkk.com)
- Imperial Klans of America Knights of the Ku Klux Klan (www.k-k-k.com/illinois.htm)

(The URLs listed were valid when we conducted our research.)
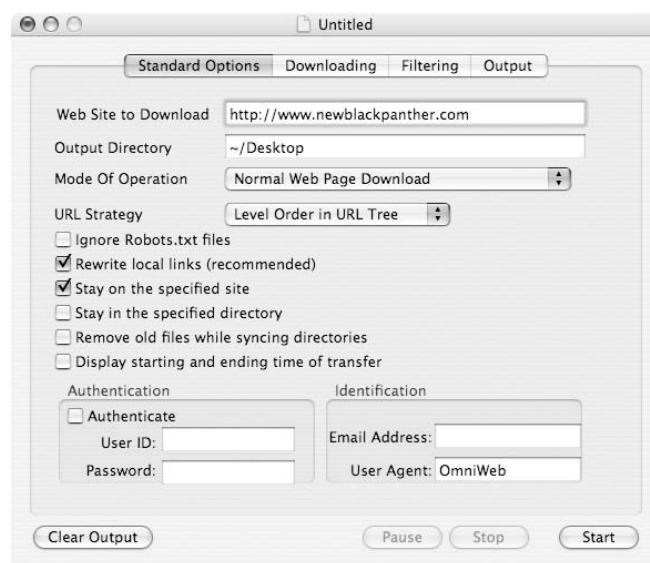
**Figure 1.** First WebGrabber interface search screen
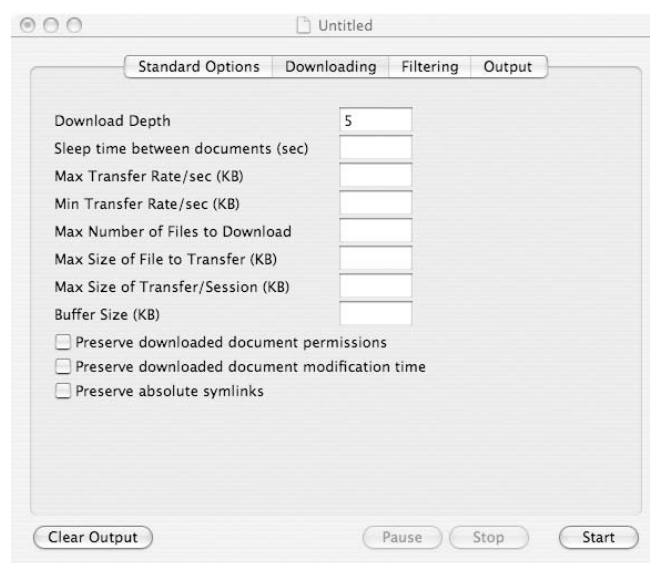
Figure 2. Second WebGrabber interface search screen

Figure 3. Third WebGrabber interface search screen

We kept a journal of all crawling activity to document what we found, how we found it, and what avenues we chose to pursue or disband as we progressed. When we found related print collections that we wanted to pursue to associate with the Web collections, we also described the corresponding library and WorldCat searches in our log. This Web-crawl log (see the examples in appendix A) served an invaluable function as we worked to trace our paths forward and backward, and it allowed an opportunity for building a family tree for this collection as each new path became another branch of the collection tree. It also helped record essential metadata for the curation of the collection. Additionally, the log helped in comparing our work to documents available on the Internet Archive, specifically the Wayback Machine, enabling us to make some comparisons about automated crawling versus the more labor-intensive crawling in which we engaged.

In an attempt to be inclusive in understanding various components of Web-based organizations, we also joined a few online discussion groups, but because of inactivity on our part for the account, we unfortunately were not able to build on much of the information that we did get. This further impressed upon us the labor-intensive nature of the work in building a sustained collection of primary-source materials from the Web.

Findings

The eight Web sites we selected afforded the opportunity to consider a number of unanticipated issues. We decided to crawl to the third level of each page, but found pages that

could not be crawled with WebGrabber. Blogs and bulletin boards written in PHP remained mostly elusive for our entire project, other than basic top-level crawls, because the content is created dynamically in a scripting language and does not easily allow the kind of crawling that typical HTML-coded pages will allow.

A continually fascinating, but completely disorienting, side effect of our crawls was the discovery of additional related resources that included new technical challenges. We found links to more Web sites, links to online stores (with additional collections materials), and links to bulletin boards, blogs, games, and podcasts. These connectors helped us discover material, such as blogs, that were important embellishments to the content of the initial site. In a few cases, we were led to primary-source printed collections that we were able to acquire. For example, the Council of Concerned Citizens Web site connected us to a man who still lived in the St. Louis area. Some decades ago, he and his wife had self-published a conservative neighborhood newsletter. He still held the collection and the University of Illinois Library was able to negotiate with him to acquire this. We also found private press publications that could only be purchased by direct contact via the Web site. In another situation, a Web site led to a comprehensive bibliography on a specific topic that enabled us to check our holdings and find missing titles.

Ethical issues became another significant topic in our work. Our initial crawls deferred to the standard that robots.txt files should not be launched on Web sites because of the high demands on bandwidth and because some Web sites have established a principle of not being crawled, but we later decided to experiment to see if we found different content by ignoring this standard. With the Web sites we were using, we found no difference in what we captured; that is, none of the sites had established a prohibition against crawling. Nevertheless, we had to discuss this issue before moving forward with the crawl.

We were confronted by other ethical dilemmas within sites when we found material that may not have been meant for public consumption. In most of these cases, no visible links could be seen, but a look at the root directories often revealed material of interest that would not readily display on the Web. This only became clear as we looked further into the structure of some of our identified sites. In a few situations, we realized that we were reading personal diaries (blogs) that we did not believe the writer intended that others would see, and likely would not expect to have captured and archived. In the print archival world, this issue would be resolved by negotiation with the author or the author's family through a deed of gift, with the age of the material often putting the contents clearly in the realm of public domain material. In the case of Internet diaries, and especially when dealing with difficult social issues related to hatred of other groups and individuals in our culture, the resolution is far

from clear cut. In this case, while we captured the output of these blogs, we lacked any contract-conveying rights to this "digital diary" and therefore chose not to allow access to this material at this time. It is our belief that standards of practice will evolve as the library and archival professions continue to explore this area of collection development. Until that time, the blogs can serve as experimental records to be refreshed in a protected sector of our digital collection as we continue to understand the issues surrounding long-term access.

We also discovered an abundance of collection material in many formats that emphasized the magnitude of collecting from the digital world. These included recordings, posters, clothing, and bookmarks that reflect the culture that has grown up around hate groups on the Internet. One case exemplifies the potential impact for collections in research libraries: the National Socialist Movement Web site provides a link to PDFs of leaflets and posters that the group encourages supporters to print and put in bathroom stalls, transportation centers, and other busy places. Because they succinctly summarize the philosophy of the organization with excellent visual images, the posters are an excellent primary source material that could be downloaded and kept in a print collection without any further work on the Web site and the digital aspects of this organization. This reinforces the important idea that current collection development practices must include active interaction with the Internet, if only to find print (or printable) materials that are significant to primary-source research.

Online games also posed a series of unanticipated challenges. The games are remarkable examples of how specific cultural perspectives can be reflected and incorporated into the online environment, providing a hands-on teaching and learning opportunity for whatever point of view is being expressed. The Web site www.resist.com, for example, has links to a number of games that can be downloaded. The archival challenges to preserving games are substantive and will require focused research to address.

Finally, as noted earlier, we took the opportunity to look closely at the work of Archive-It.org. This program offers the potential for libraries to harvest digital collections in much the same way one might set up a book-approval plan: by specifying specific sites to crawl, the frequency of the crawls, and the number of levels to be captured. The concept is of great merit and lays the groundwork for moving collection development more easily into the digital domain. The Archive-It project allows libraries to curate collections, tailoring the gathering of Web sites to the rest of a library's collection. One concern that we noted with Archive-It is its policy of removing items from the archive at the request of the site owner:

> While we collect publicly available Internet documents, sometimes authors and publishers express

a desire for their documents not to be included in the Collections (by tagging a file for robot exclusion or by contacting us or the original crawler group). If the author or publisher of some part of the Archive does not want his or her work in our Collections, then we may remove that portion of the Collections without notice.[7]

Acknowledging that Archive-It and the Internet Archive Wayback Machine are not the same, and that Archive-It has taken additional steps to assure the long-term preservation of its content, we noted instances where sites on Wayback had a number of problems ranging from broken links to ghost text that overrode the initial content that was captured. One example can be found on a page from the New Black Panthers Web site (figure 4) that displays none of the original text when initially viewed on the Wayback Machine, but highlighting the text on the page allows the viewer to see the original text. This emphasizes the importance of addressing the archiving issues attendant with building digital collections.

Figure 4. Wayback Machine result for a New Black Panthers search

Lessons Learned

The principles upon which Internet-collection development can be based—identifying the subject thoroughly and thoughtfully, understanding the publishing habits of the subject area, committing to collecting for a period of time, understanding how it fits with the rest of the collection, describing it and making it accessible, and preserving it—make this work accessible to the subject bibliographer and the research library. A powerful symmetry exists between the process of developing print collections and that of developing digital collections from the Internet. Subject special-

ists and bibliographers have the skills at hand, but many lack the technical skills to understand how to capture what we find and how to make undeniably labor-intensive and often repetitive work less so. The lessons learned are simple and straightforward:

- This work cannot be automated; it requires excellent subject specialist skills and the willingness to continually evaluate for content and follow up on new sites and organizations on a regular basis.
- The work of projects such as the Internet Archive Wayback Machine is useful but requires professional oversight; this is an excellent finding aid but requires the oversight of a bibliographer. The Archive-It subscription program takes this to a higher level of oversight and control that is moving in the right direction, although numerous technical issues related to curation, many of which are noted here, will continue to arise in the next few years.
- The Internet world is highly compatible with and complementary to our print world; as we discover and harvest Internet material, we are able to dig more deeply into print. The resulting collection is potentially very deep and rich for our present and future research community.
- Archivists and copyright experts have much to teach librarians about collecting in this domain, including issues of identifying and describing item-level (site-level) material preservation, and ethical issues.

Just as librarians have always needed to think about how much shelf space is needed for print collections, so too must server space for housing these collections be considered. The eight Web sites that were crawled produced a collection of 6.49 gigabytes, with 56,453 files in 3,110 folders. Thus even a targeted crawling system launched over a period of a few months creates storage challenges that cannot be overlooked. Likewise, it is essential to consider the preservation of these data and assure that there are adequate procedures in place for backing up what has been captured.

Setting forth the metadata terminology, and building on it from the beginning, is important in bringing structure to the collection, and also to the subsequent ongoing collection development work. It provides a template against which the subject specialist can gauge how well a new site, blog, or PHP fits into the existing collection. The metadata description is imperative both as a finding aid to the archive and to establishing rhetoric upon which to base future search and crawl work.

As a case study, this research centered upon focused identification of a subject-based topic: hate groups in the Midwestern states. The focus was on producers of content and material outside the standard realms of publishing

output, and it was necessary to adjust our thinking to collect under this rubric. The parameters for developing this collection established depths of crawls, timelines, and strategies to acquire print material that was discovered along the way. Technological challenges required consultations with other library and information technology specialists. In short, many collection development principles and practices were readily adapted to this project, but new techniques and technologies needed to be brought in.

For today's users, this collection provides an opportunity to examine the activities of a core set of hate groups from the area in the early twenty-first century, and it will continue to serve that need well into the future. For the library profession, this case study provides an opportunity to consider one way in which our collecting processes should change and how we might build a framework around this new kind of process. The next challenges lie in making this and other gatherings of Web-based collections searchable and accessible using current search and retrieval technologies and metadata coding schemas, and ensuring its preservation.

Future Implications

Why does collection development and management of Internet material matter? We know that the first e-mail message was sent in 1964 from Cambridge, or perhaps Carnegie-Mellon, or MIT—we cannot be certain because no record of this momentous occasion exists, unlike our careful recording of the first moments of the call between Alexander Graham Bell and his assistant. Our digital heritage is fragile and the challenges to identifying and preserving it are enormous. As librarians, it is incumbent upon us to collect and preserve this as part of our cultural and literary heritage, as we have done for millennia with other types of material.

Research libraries have achieved significance in scholarship because of the extraordinary special collections amassed over centuries. The commitment to finding and preserving the record of human experience *is* the role of the library and librarian. The challenges faced by those who built our print-based specialized collections provide inspiration and guidance in continuing that same commitment for the future: specialized digital collections of online diaries, Web sites, games, and ephemera. Research libraries need only look to the printed items in their collections that might well have seemed frivolous at the time of acquisition—the *Collyer's Eye* streetwise sporting weekly or the penny novels of the 1800s—to understand the rich research value today of the publications that existed on the fringe at the time of publication.

For any number of reasons (lack of funding, lack of staffing, lack of training, etc.), our research libraries currently are challenged by missed collection opportunities from the

Internet. Collection development librarians tend to focus energy on gathering the canon, and making certain that collections house the best of published materials. Developing a collection of future value rests on collecting well beyond that scope, building new types of collections that incorporate materials with related Web output, and venturing into areas that have often been cast as the province of the public library. Video-gaming strategy guides and political punditry newsletters serve as examples. While collections of electronic games are being built and studied at Stanford University, more collection development endeavors such as capturing gaming blogs and other gaming Web sites have their place in many libraries. The explosion of social networking sites may well provide yet another avenue of output for collecting in future years as more and more users publish original materials of all types there. Our project team noted with interest and dismay that most of the printed materials created and distributed by organizations considered to be hate groups are not found in our nation's libraries. Even more intriguing was the discovery that these groups currently sell their printed materials online, as well as disseminate their ideas through Web sites, blogs, and links to like-minded groups.

While many Web preservation projects are underway throughout the world, they do not appear to be building their work on libraries' rich collection development practical history; few are exploring a topic or subject-based collection development approach. Still fewer are exploring in-depth, high-quality Web crawling projects that seek for depth of a topic, not breadth. None are considering how these yet-to-be-codified processes are ideally suited for collecting nontraditional materials from people and organizations that fall outside not only mainstream culture but outside of traditional library collection development policies. Ross has stated that "the actual theories, methods, and technologies that can either foster or ensure digital longevity remain startling limited."[8] The transitory nature of the Web is a clear signal to libraries to extend what we know about collection development and management quickly and fully into the environment of the Internet.

References

1. Wallace John Bonk and Rose Mary Magrill, *Building Library Collections,* 5th ed. (Metuchen, N.J.: Scarecrow, 1979); G. E. Gorman and Ruth H. Miller, *Collection Management for the 21st Century: A Handbook for Librarians* (Westport, Conn: Greenwood, 1997); Peggy Johnson, *Fundamentals of Collection Development & Management* (Chicago: ALA, 2004).

2. Richard Pearce-Moses and Joanne Kaczmarek, "An Arizona Model for Preservation and Access of Web Documents," *DttP* 33, no. 1 (2005): 17.

3. Margaret E. Phillips, "What Should We Preserve? The Question for Heritage Libraries in a Digital World," *Library Trends* 54, no. 1 (2005): 57–71; Neil Beagrie, *National Digital Preservation Initiatives: An Overview of Developments in Australia, France, the Netherlands, and the United Kingdom and of Related International Activity* (Washington, D.C.: Council on Library and Information Resources, 2003).

4. Library of Congress, "Digital Preservation: What the Library is Doing," www.digitalpreservation.gov/library (accessed Jan. 17, 2008).

5. Archive-It, "Welcome to Archive-It," www.archive-it.org (accessed Jan. 17, 2008).

6. Southern Poverty Law Center, "The Year in Hate," *Intelligence Report: A Project of the Southern Poverty Law Center* 125 (Spring 2007): 48–70.

7. Internet Archive, "Terms of Use, Privacy Policy, and Copyright Policy: Terms of Use," www.archive.org/about/terms.php (accessed Jan. 17, 2008).

8. Seamus Ross, "Digital Preservation, Archival Science and Methodological Foundations for Digital Libraries," paper presented at the 11th European Conference on Research and Advanced Technology for Digital Libraries, Budapest, Hungary (Sept. 16–21, 2007), www.ecdl2007.org/Keynote_ECDL2007_SROSS.pdf (accessed Jan. 17, 2008).

Notes on Operations

Evaluating and Improving the Presentation of Serials Information in the Online Catalog

By Lori J. Terrill

Many factors should be considered when evaluating how serial publications are presented in online library catalogs. Both patrons and library employees utilize the catalog to locate serial titles and then must be able to determine which formats are available, as well as which issues are available in each format. Consideration of both the recording and display of serials data should be part of a thorough evaluation. This paper presents an outline for an evaluation focusing on meeting user needs. It also provides advice based on the experience of undertaking a successful project at the University of Wyoming Libraries.

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Serial publications, including scholarly journals, are an essential part of any academic library's collections. The library's online catalog works in tandem with indexes, article databases, and OpenURL resolvers to provide access to serials information. Discussions about the role of the catalog and cataloging rules have been common in the library community within the past few years. Most people will agree that any feasible effort to improve upon library catalogs must build on the bibliographic and holdings data libraries have been creating and maintaining for decades. While library catalogs and cataloging evolve, librarians should be proactive in making their online catalogs as user-friendly as possible, using the integrated library system (ILS) technology and functionality currently available to them. They should also try to position themselves to take advantage of future enhancements to library system technology by thinking about data recording and data display as separate but complementary entities.

The goal of this paper is two-fold: it provides an outline for evaluating serials displays in the online catalog, referring to relevant literature, and provides advice based on the experience of undertaking a successful project at the University of Wyoming (UW) Libraries. The UW Libraries serve a population of approximately 13,000 students and support undergraduate, graduate, and faculty research. Holdings include approximately 41,000 serials in print and other physically held formats and access to more than 42,000 online serials.

An evaluation of how serials are presented in the online catalog can be guided by these key questions:

- How should a library represent serials owned or licensed at the title level?
- How should a library represent the specific volumes and issues owned or licensed for each title?
- What is the role of the catalog?

To address these issues, one must look at what data should be included, the source of the data, how it is recorded, and how it is displayed.

Literature Review

Literature on the subject of the presentation of serials information in the online catalog ranges from general works on the problems users face in finding and interpreting serials information to papers addressing specific aspects, including holdings information, information on volumes involved in internal workflows, online catalog displays, and issues related to online serials.

The Serials Maze

Serials are a particular area for confusion in online catalogs, as they were in their paper-based predecessors. A quarter century ago, Pinzelik described the confusion caused by the "serials maze," saying, "Patrons want to know if the library subscribes to a specific title, if the library's holdings include a certain volume and issue, where the issue is located, if the pages are intact, and if they can photocopy it, check it out, or sit down and read it."[1] She adopted a user perspective in outlining the process of finding information about serials, identifying up to twenty-four decision points for a user. Her solution was a serials information desk to help patrons navigate the complexities of serials. Additionally, she suggested reducing special locations, using shelf dummies, creating better signage, and creating clearer serials records.

Cipolla addressed the same topic in "Finding a Way Out of the Serials Maze."[2] Possibilities for the use of technology in libraries were blossoming in 1988, and Cipolla identified seven ideas for how "the power of the computer could be harnessed to find a way out of the serials maze."[3] These were "integrated public access catalogs that include location and holdings data for serials," "natural language display," "networked access to area union lists," "automatic links between indexing and location tools," "access

to journal contents through the online catalog," "broadened search capabilities," and "remote user access and document delivery service."[4]

In 1996, Snavely and Clark outlined five steps a user takes from finding an article in an index to physically locating it in the library. According to their analysis of online catalog displays, "screen design may be more important for serials records than for any other type of material in the online catalog."[5] They agreed with previous research that recommended open displays rather than dense text, and suggested the use of brief records fulfills this recommendation. Deciphering holdings information was one of the steps identified as a point for user confusion. The authors indicated that the word *holdings* itself may be meaningless to the user and complained that this information is often buried beyond the first screen displayed. Other problems noted were lack of differentiation between publication information versus information on the volumes owned, lack of understanding that a hyphen denotes open and ongoing holdings, and confusion caused by vague statements such as "current issues." Finally, Snavely and Clark addressed confusion over where to look for an issue when a library has multiple shelving locations. They made three broad recommendations for change: link holdings in periodical databases to serials holdings records; use brief, easy to understand records; and change some cataloging rules and practice.

Fescemyer's "Serials Clutter in Online Catalogs" in 2005 dealt with both the search process and the display of the serials records themselves.[6] In her study, record complexity was measured by assessing three factors: number of lines in the bibliographic record portion of the display, number of lines of holdings information, and the sum of the two. Fescemyer argued for one bibliographic record for all formats of a title and less cluttered

brief records as the default display, although she did not define which fields should be included in this brief display. A link to detailed records would be provided for librarians and experienced users. She questioned the use of lengthy holdings statements, suggesting instead "a compact list with missing issues noted."[7] Displaying the call number prominently and in the early part of the record was another of her recommendations.

Holdings Information

Despite the fact that holdings records function as the nerve center for local serials information in the catalog, they have not received much attention in published display guidelines beyond the holdings statements themselves. The International Federation of Library Associations and Institutions (IFLA) online catalog display guidelines did not address the information found in a holdings record.[8] Cherry's evaluation checklist addressed the topic in a limited way, asking if the call number is located near the top of the display, if holdings and location information are displayed, and if circulation status information is displayed.[9] She further asked if holdings, location, and circulation status information are displayed adjacent to each other and separated from bibliographic information. She did not mention aspects of interest to those specifically looking at serials displays, such as the display of checked-in issues, treatment of multiple locations for a run (for example, if bound volumes and unbound issues are shelved in different areas), or issues involved in internal processes, such as bindery or repairs.

The aspect of holdings data that has received the most attention in the professional literature is the recording and display of holdings statements using the Machine Readable Cataloging (MARC) Format for Holdings Data. The history of stan-

dards development and overviews of them have been discussed by many in the literature.[10] Others have chronicled experiences with implementation of holdings standards.[11] Within these discussions, commonly mentioned reasons for following the holdings standards included consistency in the recording and display of holdings data, ease of data migration, ability to share data on publication patterns and holdings, facilitation of automated or predictive check-in, and support of metasearching. Drawbacks noted included limitations due to ILS functionality and the initial investment in training and staff time. Overall, most articles have supported the use of holdings standards. For example, Alan argued, "The use of holdings standards can provide for more accurate, detailed, and consistent retrieval and display of holdings information."[12]

One article took a more skeptical look at the standard. In 1997, Wallace asked the question, "Serials Holdings Statements: A Necessity or a Nuisance?"[13] She believed the key advantage of holdings statements was as "a quick and dirty summary of volumes the library *should* own."[14] She saw serious limitations such as lack of availability information, difficulty of maintenance, and detraction from item level searching in online catalogs that include that feature. Wallace conducted a survey of eighty online catalogs for academic and special libraries to look for the use of summary holdings statements, the availability of item-level information via check-in information or item records for bound volumes, and the availability of status information and circulation policy. She found significant gaps among various systems' capabilities and a continued reliance upon holdings statements, but looked toward a future possibility of item-level displays replacing them.

Two other articles warrant discussion, as they describe more fully the decisions addressed in following the standard. Baker looked at the

experiences of an early adopter of the USMARC Format for Holdings and Locations. He briefly discussed the decision to record holdings as level 3 (summary) or level 4 (detailed). Baker argued that the primary advantage of level 4 is the "greater support for public access, ILL, check-in and bindery functions" it provides.[15] He recommended useing level 4 for current serials holdings and at least level 3 for ceased or canceled titles. For maximum flexibility, he argued for using paired 85X/86X fields when inputting data.

Moeller and Lu presented the results of a survey on libraries' implementations of the MARC 21 Format for Holdings Data (MFHD).[16] They collected information on ILS functionality, where and how holdings data is recorded, practices for physically held versus remotely accessed serials, and the use of paired fields. Respondents cited future ILS migrations and expected ease of migrating data most often as factors in choosing to use paired 85X/86X fields to record holdings. Other common reasons included consistency of display, use of patterns and holdings to expedite predictive check-in, the hope to be able to take advantage of future ILS enhancements to check in functions and display functions (such as compression and expansion), and future sharing of patterns and holdings among libraries. Among the reasons for not using paired fields were satisfaction with the functionality and look of the current system, difficulties of converting existing holdings, the expectation that they would be harder to maintain, lack of ILS functionality to support them, and cost. Moeller and Lu stressed that a library should do its homework as a part of the decision-making process: "A thorough knowledge of MFHD and an understanding of the needs and limitations of one's own library provide the foundation for making well-informed decisions about the use of MFHD."[17]

Volumes in Internal Workflows

Issues or volumes may be temporarily unavailable because they are involved in internal workflows, such as the binding of issues or repair of damaged volumes. Tracking these issues, as well as those known to be missing or lost, is a common concern for libraries, although it is receiving almost no attention in the literature.

Goldberg and Neagle looked at tracking serials in the online catalog.[18] The model they outlined involved sharing responsibility between public and technical services to keep serials information in the online catalog current. This included steps to document volumes in the bindery workflow and issues not available in current periodicals (such as missing issues or issues that are not available without staff assistance). They argued that "patrons expect to find up-to-the-minute information on serials, and serials modules of automated systems should be equipped to handle it."[19]

Online Catalog Displays

Some observations about online catalog displays remain little changed over time. In 1995, Hildreth wrote, "Effective bibliographic displays are influenced by both content and presentation factors. The design goal is to facilitate user comprehension and decision making."[29] Online catalog displays have been addressed regularly in the literature, and the following represents only a limited review, including two articles addressing the contents of brief displays and two examples of display guidelines.

Thomas looked at the content and layout of bibliographic displays in 2001.[21] He pointed out that "it is not enough for the system merely to store and retrieve information; to be useful, this information must be presented to the user in a manner that the individual can interpret meaningfully."[22] His review of the literature on

screen design included system-oriented research, human factors research, and cognitive research. Participants in his study performed subject-oriented tasks using different interfaces: with and without labels and also with variation in the content of the fields displayed. He found that adding subject-oriented data (subject headings and summary notes) to brief displays resulted in less need for participants to look at full displays. He also found that layout—labeled displays versus International Standard Bibliographic Description (ISBD) punctuation and no labels—did not significantly affect the time it took participants to complete tasks. His study concurred with earlier studies in finding that users (particularly novice library users) consider only a few fields in the bibliographic record to be important. These were title, subject headings, and summary notes, although previous research he cited also mentioned publication date, author, and call number as important. Thomas did not specifically examine serials displays.

Carlyle and Timmons looked at the contents of default displays in online catalogs.[23] They provided a literature review that included similar studies, mainly from the 1990s. All studies showed title, author, subject headings, and date of publication to be the most important elements; call number, URL, summary, publisher, and other authors were also commonly mentioned as top elements. Their study looked at which of thirty-eight MARC fields were included in the default displays (assumed to be the briefest display) in a random sample of 122 Web-based catalogs. They found a rate of display for the fields ranged from 100 to 56 percent. Those fields displayed by 100 percent of the catalogs surveyed included: personal author main entry and title/subtitle. More than 90 percent of catalogs displayed corporate body and conference main entries, uniform titles, statements of responsibility, general material des-

ignations, subject headings, call numbers, and publisher information. Fields associated with continuing resources, frequency (310 field only), and dates of publication and volume designation (362 field), were found in default displays at rates of 73 percent and 67 percent, respectively. Electronic location and access (856 field) were displayed in only 88 percent of catalogs. Most catalogs (90 percent) displayed twenty-seven or more fields, with only around 8 percent displaying sixteen or fewer fields. They concluded that "the elements users identify as important are missing in a significant number of catalogs' default record displays," thus concerning them that some displays may be so brief as to be incomplete or misleading.[24]

In 1998, Cherry published a detailed checklist for online catalog displays consisting of 133 questions.[25] While a few of her guidelines seem highly subjective (for example, insistence that labels be in all uppercase), most are useful to consider. The guidelines are presented in four sections covering labels, text, instructional information, and page layout.

IFLA's display guidelines were grounded on a three-point framework: "The overriding primacy of users' needs . . . the importance of the content and arrangement of records to finding, identifying, selecting, and obtaining resources . . . [and] the requirement to follow accepted international standards for information content and structure."[26] Recommendations were further broken down under each of these principles, although a library's ability to meet the guidelines may be limited by the functionality of the particular online catalog it is using. In the category of users' needs, some suggestions included providing context-sensitive help, avoiding library jargon, displaying all information necessary for the user to obtain the resource, giving information on access requirements and restrictions, and using different "views" or interfaces to accommodate

different user groups. Suggestions for content and arrangement included using full displays as the default single-record display (with a shorter display option), providing an option to view fully encoded records (for example, MARC records), and providing links to information external to the catalog.

Online Serials

Many researchers have tackled issues relating to online serials and library catalogs, beginning in the mid-1990s. The following represents a selective review of the literature on this topic.

Cole examined online serial access in "Impacts of the Abandonment of Catalog Records for Electronic Serials."[27] He listed a number of things that an alphabetical list cannot do as well as an online catalog. Shortfalls of alphabetical lists included an inability to search by the name of an issuing body, an inability to record variant titles, an inability to provide access to an earlier title when all issues have been amalgamated under a later title, a lack of detailed subject access (beyond title keywords), and no tracing of relationships between serials. Cole summarizes his argument thus: "The abandonment of catalog records for electronic serials, while viewed as a cost-saving measure, would severely hinder the patron's ability to locate the publications, and thus would come with a cost of its own."[28]

McCracken, Serials Solutions cofounder, also discussed the issue of title lists versus the online catalog.[29] He asserted that the online catalog is the primary source for information about a library's holdings and, because of its rich access points, it should not only be maintained, but expanded. He observed, "Adding records to the OPAC for electronic journals confirms that the OPAC is the single source for locating information about all of a library's journal subscriptions, regardless of format."[30]

The single versus separate record question has been addressed several times in the library science literature. Morris and Thomas considered the question from a user perspective.[31] They noted the advantage of the "computer file" (now "electronic resource") general material designation as a way to flag electronic content for users. Separate records also have the advantage of being pulled out into subcatalogs, which benefits users who prefer online versions. Management issues, such as more accurate statistics for collection additions and withdrawals, consistency, and the ability to use records created by others, were cited as other points in favor of separate records. "We consider separate records to offer more clarity to users than single records. Users may well be presented with a choice of records, but at least when a record is selected all the information available is clear and concise. . . . In our view, single records can at times overwhelm users with too much detail."[32]

In 2003, Giles presented an outline of the arguments for single and separate records.[33] This concise overview of the topic cited reasons for using separate records as tracking differences between online versions and print versions, unique ISSN, less confusion if one always uses a separate record to describe the online version, user preference for online versions (and a desire to limit searches to online only), and the ability to utilize copy cataloging. Giles also presented arguments for using single records, which included the perceived higher cost of cataloging when using separate records and that public-services staff view single records as simpler. She argued that "users want simplicity and consistency," but there is no agreement among librarians which method of cataloging best achieves that goal.[34]

Bordeaux used a survey to examine the question of single versus separate records.[35] While she found no clear preference in practice among respondents, those using separate records were more likely to have most (76–100 percent) of their online serials represented in the catalog. Also notable was the similar perception of patron satisfaction between libraries using the single record approach versus separate records. Bordeaux concluded, "The close division between the use of single records and the use of separate records suggests that, at least among academic libraries in the United States, there is no consensus regarding the best approach to take when cataloging electronic serials."[36]

Growing interest in the practical application of the Functional Requirements for Bibliographic Records (FRBR) model ties into the separate versus single record debate. Oliver examined this issue in her paper on content versus carrier in FRBR.[37] She pointed out that the single record approach, also referred to as the non-cataloging approach, "responds to the need for collocation, a fundamental principle underlying the catalogue. However, it aims to ensure collocation, not by the grouping together of records, but by adding a pointer to the electronic version on the print record."[38] The downside is that single records describe the print, not the online, and therefore the online version "is not clearly visible in the catalogue as a separate manifestation."[39] In the separate record approach, each manifestation has its own description on its own record, including aspects such as notes, linking fields, and uniform titles. But current online catalog functionality may not achieve sufficient collocation. Oliver wrote, "A FRBR-based display in the next generation of OPACs could overcome some of the drawbacks in each approach and allow for a grouped display of records clearly indicating that the print and electronic versions are different manifestations of the same expression of the same work."[40] She argued that each manifestation has unique attributes, so describing each is "important

for the user to be able to find, identify and select."[41]

A 2007 article by Allgood also addressed multiple manifestations of serials in online catalogs.[42] Allgood looked at three approaches to improving online catalog displays: revision of cataloging rules; imple-mentation of the FRBR model; and utilization of MARC 21 authority, bibliographic, and holdings formats. Some exceptions to manifestation-level cataloging practice include CONSER's single-record approach (URLs for electronic versions are added to print versions) and aggregator-neutral records (multiple online manifestations are described by a single record). The multiple version (MulVer) problem was not definitively resolved with either of these practices. He mentioned the work of the Joint Steering Committee for the Revision of AACR's Format Variation Working Group, which concluded that expression-level collocation was a more realistic solution than expression-level cataloging. Allgood saw two options for solving the MulVer problem—"change cataloging practices or improve OPAC displays"—but admitted that the former seems unlikely due to the millions of existing manifestation-level records in current catalogs and the need to track manifestations for internal processes.[43] He concluded that "improving OPAC display capabilities holds the greater promise for helping librarians resolve the MulVer problem. Two specific initiatives, the FRBR conceptual model and the MARC 21 communications formats, may bring us even closer to this goal."[44] The MARC 21 authority format could be expanded to include the communication of work and expression identifiers that would facilitate better collocation in online catalogs, according to Allgood. Looking to the future, he argued for a distinction between data storage and display: "The necessity for libraries to store and exchange data as cohesive manifestations-level descrip-

tions though in no way forces OPACs to display data in the same way."[45]

The Project

The project to evaluate the presentation of serials information in the online catalog at UW Libraries was done at the request of the library dean, who formed a task force for that purpose. On the basis of task force's experiences, the following sections outline guidelines for approaching the evaluation process from the formation of an evaluation team to report preparation and follow-up.

Creating an Evaluation Team

The composition of the team is vital to its success, not only because of the knowledge the members bring, but also due to their attitudes toward the project. First, having various perspectives represented is important. In our case, the group was composed of two technical-services librarians, two reference librarians, and a paraprofessional staff member with both technical and public-services experience. Four to five members is a good size for a group—large enough to have varied opinions and expertise, yet small enough to still function efficiently. Any expertise lacking in the evaluation team can be remedied by interviewing internal or external experts and by searching the library-science literature and other information sources.

Second, team members must be open-minded. For the evaluation to be successful, members must be willing to question the status quo, think creatively to explore a variety of options for any given problem, and be open to input from outside the group. Any individual who is simply there to defend the status quo will only hamper the work that needs to be done. This is not to say that change in every area evaluated is inevitable, but the group must at least be open to that possibility.

Finally, members must be committed to the task. We devoted seven months of intensive work to this project. Team members normally met once a week (sometimes more) and put in numerous hours outside of meetings. Many details require consideration, so members must be able to devote the time and attention to the process that is required.

Adopting the User Perspective

The evaluation should be approached with a focus on user needs. Users include both internal users (library employees) and external users (students, staff, and faculty), but one should try to adopt the perspective of external users as much as possible. Procedural issues may be kept in mind, but creating new procedures is usually best left to the departments doing the work. By not worrying about procedures, one can keep user service as the primary concern.

Adopting the perspective of users in the evaluation process is complicated because no typical user exists. Libraries serve a population that falls along a continuum of user types. Mann, a reference librarian at the Library of Congress, described two types of users: scholars and quick-information seekers.

> Obviously there is a spectrum of continuities between the two—no one disputes that— but there are also big differences that are too often swept under the rug. Scholarship requires linkages, connections, contexts, and overviews of relationships; quick information seeking is largely satisfied by discrete information or facts without the need to also establish the contexts and relationships surrounding them. Scholarship is judged by the range, extent, and depth of elements it inte-

grates into a whole; quick information seeking is largely judged by whether it provides a "right" answer or puts out an immediate informational "brush fire."[46]

He argued that scholars are the real niche audience of research libraries, so those libraries have *"a particular responsibility to serve the needs of scholars*—especially because the alternatives of Google, Amazon, Alta Vista, while being excellent sources for 'something' on a subject provided 'quickly,' nonetheless fail to support *scholarship* in several specific (and very important) ways."[47]

While Mann's quick information seekers may bypass the library catalog entirely, those who do use the catalog vary in both diligence and abilities. Some searchers may not understand the online catalog's capabilities or do not put much thought into their searching techniques. They may want only the most basic information about the title plus a call number or URL. Others develop greater expertise with the online catalog to create more finely tuned searches. They may be more likely to read more of the bibliographic records to determine if the item is truly what they want. Libraries should strive to meet the expectations of these diverse searchers and must keep their varied needs in mind.

Collecting Background Information

In the early stages of the evaluation team's work, committee members may need to be educated on some aspects of current practices and problems. Public services members may need an overview on current cataloging policies or information on how the ILS works behind the scenes to create the online catalog displays. Technical services members can benefit from understanding what some of the primary confusions about the online catalog are from the questions users often

ask public services personnel. Other relevant areas for gathering information may relate to federated search tools, OpenURL resolvers, involvement in a union catalog, interlibrary loan, holdings standards, the FRBR model, institutional history of online serials access, and online catalog features and functionality. Conducting a literature review for relevant areas of interest should be a part of this information-gathering process.

Looking at the online catalogs of other libraries, in particular those using the same ILS, is one of the most valuable steps one can take early in the project. It provides a good overview of the features that can be customized in the online catalog and options for those customizations. Look for examples of alternate terminology to use for labels, wording for public notes, various record display contents (i.e., which MARC fields display), and different ways to display holdings statements. Because the online catalog is a visual and interactive medium, looking at live examples is preferable to only reading about features in the ILS's manuals.

Gathering Input from the Users

Nearly every library employee has an opinion about the online catalog. One finds some of the most frequent and sophisticated users of the catalog among library employees; they also answer questions from an array of people, from novice catalog users to experts. This makes them an ideal group from which to collect feedback. Face-to-face meetings are a good mechanism for gathering employee input. Offering two or more session choices will encourage maximum participation without inconveniencing departments with public service points to staff. If meetings are not possible, a survey instrument is another tool that could be used to collect feedback.

We used the following model for our forums to gather input from library employees: One of the evaluation team

members served as a moderator, guiding participants through the various screens (for example, search screen, results list, bibliographic record displays) to get feedback. One should show examples of records for both print and electronic formats. Guided questioning can be used to focus the participants on various aspects of the displays. Whenever someone does not like some aspect of the display, ask for suggestions on how to improve it. After reviewing your own catalog, show the group examples of other library catalogs to get their reaction to different display options. In our case, we received valuable input and found that face-to-face meetings offered the advantage of promoting discussion. The forums identified not only problems but also possible ways to make improvements, as well as input on what is already good about the online catalog.

The evaluation team should discuss the potential role for user studies with students, staff, and faculty outside of the library. Also consider examining user data that has already been collected—for example, comments from surveys such as LibQual+. If you have a good grasp of the major points of confusion in your catalog, you may want to wait and employ user studies as an evaluation tool after recommendations are implemented, to see if they solve the current problems and to identify further areas to fine-tune. If current problems are not clear, a library may want to undertake user studies early in the evaluation process.

Focus Areas

Evaluating the presentation of serials information in the online catalog necessitates consideration of data recording and data display issues in several areas. Organizing the evaluation into logical units, or focus areas, is useful in a broad evaluation for the work to proceed more efficiently. The following sections outline the evaluation of four focus areas: holdings information,

volumes in internal workflows, online catalog displays, and online serials.

Holdings Information

"How should a library represent the specific volumes and issues owned or licensed for each title?" was one of our key questions. When examining holdings information in the catalog (including the range of data that may be stored in the holdings record), a number of other more specific questions emerge:

- Are holdings statements complete and in a form easily understood?
- How are multiple locations handled? Unbound versus bound issues? Issues held in storage?
- Are issues held on reserve for courses or other purposes?
- Is subscription information explicit and helpful?
- Are the locations spelled out fully, with directional information as needed?
- Is the call number prominently placed in the record?
- Are the data elements entered and displayed consistently?

Holdings statements (the listing of the volumes held in a library's collection) are a key element to be evaluated. This data may be recorded in coded statements using the MARC Format for Holdings Data or as free text, which may follow recognized standards or be based on a locally created system. In looking at a library's current practices, one must ask if the information is presented in a way that is easy for users to interpret and if the information provided is complete enough for users who may be lacking a full citation. Completeness should also be balanced with readability. If the data display is not readily understandable or is long and complex, alternate methods of data recording and display should be considered. Even if data display is

clear, assessing how data is recorded may be advantageous.

For those libraries that need to improve data displays or how data is recorded, the two primary issues to consider are whether to use free text versus coded paired fields and which level of holdings to record. The previous literature review outlines the advantages of using paired 85X/86X fields for recording holdings data. While converting holdings is a time-intensive proposition, it should not be rejected outright based on time alone. Limited conversion projects (for example, focusing on current subscriptions) or those done gradually as time allows may be an option for libraries with satisfactory data displays. Those with unsatisfactory displays are faced with a more pressing need to make improvements. They should give paired fields serious consideration, even if their current ILS does not fully take advantage of them.

The library science literature offers limited guidance on deciding the level of holdings to record, but leans toward using level 4. While level 4 holdings are attractive because of the detailed information they provide, there may be two obstacles to their implementation for libraries to consider. From the patron perspective, journals with multiple missing issues may have displays that are long, complex, and not readily scanned. This may be a barrier to getting users to read the holdings statement. Second, if check-in histories for titles are incomplete or inaccurate, staff may need to physically check the volumes to obtain accurate data for the holdings record. This scenario would significantly slow down a conversion project. Level 3 holdings may require users to check the shelves to verify that a particular issue is present, but the statements tend to be shorter and less complicated to read. The addition of a public note listing those volumes known to be incomplete would alleviate, to some extent, the problem of not knowing which issues are miss-

ing. Level 3 holdings statements are simpler to create than level 4, and a retrospective conversion project could be done much more quickly. Another point for consideration is the ability of the ILS to display lists of item records or receipt histories, as this information can supplement holdings statements in helping the user to determine what is owned. Our recommendation recognized a place for both level 3 and level 4 holdings statements. Most periodicals would receive level 3 holdings statements, but we would use level 4 holdings in certain situations, primarily for titles issued annually or less frequently, or for locations with limited or scattered holdings.

Another important facyor to consider is how the physical locations of the issues are communicated to the user. For example, unbound periodical issues may be shelved in a different area than bound periodical volumes. Titles also may be kept in multiple collections within the library system. Common scenarios include having the newest edition of a title in reference and older editions in a circulating location, paper issues that are replaced by microformats, and having certain core titles available in multiple branches. Options for handling these cases will vary because of ILS functionality, but may include creating a unique holdings record for each location, using public notes, or utilizing the display of item-specific information (such as check-in display, item records, or item statuses). Whatever method is used, the clarity and conciseness of the presentation of location information is important to users readily interpreting it.

Subscription status for a publication is of interest to users, particularly when the status involves a cancellation or a change from print to online format. The convention of leaving holdings open-ended for current subscriptions is not the clearest way to convey that information to the user. If subscription information is not clearly

communicated to your users, consider using public notes for that purpose.

Some other aspects of holdings information are not unique to serials, but are worth evaluating. One important factor to consider is the display text for location information. Watch for shorthand descriptions like "Geology" instead of "Geology Library" or "Ref" instead of "Reference Collection." If character limits allow, one can also incorporate directional information, such as specific floors within a building, or service points, if the public must ask for the title at the circulation or reference desk. Also consider how the library handles titles that have not yet been cataloged if they are displayed in the online catalog. In these cases, location text could direct users to a service point or online form to initiate expedited cataloging.

The call number is generally cited as one of the most important pieces of information in the record for physically held items, and placing it prominently in the record is a common suggestion. While some may advocate for moving it to the top of the record display, in the case of serials, one should be cautious about separating the call number from other holdings information, since the holdings statement, check-in display, circulation status, and public notes are also important points of information for locating the desired volume.

As a final consideration, ensuring that information is entered and displayed consistently is good practice. Using international standards for holdings statements is one way to achieve this. If international standards are not followed, make sure local practice is well defined and consistently applied, and to establish clear, consistent wording for commonly used public notes.

Volumes in Internal Workflows

Looking at how volumes involved in internal workflows are tracked in the online catalog is another aspect of representing the issues and volumes

owned. We found that public services personnel were experiencing frustration in locating these volumes, so external users likely were equally confused. After identifying the different categories of these workflows that exist in your library (for example, "bindery" or "repairs"), assess how well the items for each are being tracked in the online catalog, including whether users are directed to alternate means of obtaining the item, when applicable. If there are problems, you may need to consult with technical services personnel to determine their processes, if and how the items are tracked in the ILS, and if alternative processes may work better for getting information to users. It may also be helpful to consult user manuals to learn about ILS functionality or to contact other libraries using the same ILS to learn how they handle similar processes.

How missing or lost issues and volumes are documented should also be evaluated. As with internal workflows, looking at procedures, consulting ILS manuals, and seeking advice from other libraries may be in order. In tracking these volumes, it is also good to direct users to alternative means of obtaining the item, if possible.

Online Catalog Displays

Some presentation issues may not be exclusive to serials, but nonetheless are an important part of an evaluation of serials information in the online catalog. The following are several questions to guide the evaluation:

- Which display options should be offered? Which display should be the default display?
- Which fields are essential in a brief display? Which fields should be included in a full display?
- In what order should the fields display?
- Are labels meaningful and do they avoid jargon?

- Is help available at the point of need?
- Are related records linked?

Determining if your ILS will allow customization unique to each format is important. If not, you will need to keep in mind how decisions will affect the display of other formats, such as books, videos, and maps.

If your ILS offers the option of creating different displays or views, consider utilizing both a brief display and a full display. In our evaluation, we got a strong sense from reference personnel that the full display of the bibliographic record contained information that was not of interest to most patrons. We also knew our more advanced users would likely miss certain pieces of information if they were removed from the display. Offering a brief display option, in addition to a full display, can be a good compromise in handling this dilemma. We decided to make the brief record the default display (contrary to IFLA guidelines) since it would be best suited to less sophisticated catalog users. More advanced users would have the option to select a fuller display, and they would probably be more likely than other types of users to make the effort to switch display types. A library should take into account their own collections and unique needs when deciding what fields to include in their displays. With respect to serials, consider omitting the dates of publication and sequential-designation information from MARC field 362 from the brief display, since they are often confused with holdings information.

After deciding what display types to offer, the next step is to evaluate the order in which the fields display and, if using a labeled display, the wording of those labels. You should strive to remove library jargon in favor of natural language and avoid abbreviations (although with character limits this is not always possible). As mentioned previously, looking at other libraries'

online catalogs can provide useful examples.

Point-of-need help is an area where many online catalogs could be improved. One common way to provide this is through help screens via links in the Web page's header or footer. Our perusal of other catalogs using the same ILS showed that labels in the online catalog can display as hyperlinks to help screens. In addition to addressing frequently asked questions, links to library floor plans, circulation policies, or contact information for reference services may be useful. In evaluating this area, think about what questions users might have and how it is to find answers.

A final area for consideration is linking related records, particularly direct links between different formats of a title (if cataloged on separate records) or direct links to earlier or later titles. If your catalog currently does not provide these types of links, consult your ILS's manual or other catalogs utilizing the same ILS to determine possible options to improve links between related records. If it is not being done already, maintaining the data that can support these links, such as control numbers in linking fields (MARC fields 76X–78X), should be considered.

Online Serials

How to provide access to online serials has been a matter of debate within libraries for more than a decade, as the earlier literature review demonstrates. Issues with online serials are integral to the key questions of how to represent serials owned or licensed at the title level, as well as what the role of the catalog is. A number of specific questions emerge:

- Should online serials be included in the online catalog or in a separate alphabetical list or both? What about aggregator titles?

- Should online serials go on separate records from their print counterparts, or should both formats go on a single record?
- Which approach to cataloging is feasible for a library in terms of staff time or costs of vendor-provided services?
- How does the library ensure users are seamlessly authenticated?
- How and where should access data be recorded and displayed?
- How and where should holdings data be recorded and displayed?

When considering issues related to online serials, internal management issues often play as big of a role in decision making as user access issues. Vendors have sought to fill a niche in this arena through subscription services that allow libraries to leverage their data to support both alphabetical lists and MARC records for their catalogs. Libraries will want to do a cost analysis of outsourcing versus in-house cataloging and database maintenance as a part of the decision-making process. A decision to include online serials in the catalog supports the idea that the role of the catalog is to provide access to all titles owned or licensed regardless of format. Whether the cataloging is done internally or is outsourced, a few policy decisions that will affect the user experience need to be made.

Deciding between single and separate records is the biggest decision. Most librarians will agree that collocating titles in various formats is desirable, but is this the job of the bibliographic record or the online catalog? This is one issue for which data display and data recording issues have become entangled. Using separate records will likely put libraries in the best position to take advantage of FRBR-related innovations in future catalogs. Anecdotal evidence also points to separate records as the most

efficient option when outsourcing the cataloging. Other points for consideration have been outlined above.

Access issues are a key area to be evaluated. Many libraries have implemented a proxy server to authenticate patrons. For online catalog users, two common approaches to authentication are requiring log-in at the point of entering the catalog or adding a proxy prefix to the URLs of subscription-based resources. Consider which approach will work best with your online catalog to ensure smooth user authentication. A decision also must be made about displaying a raw URL versus display text for the link. The evaluation team should consider if the link is prominent in the record and if any other links in the display may be mistaken for the link to the resource itself.

Holdings data is another category that needs to be assessed. Options may include recording and displaying data in the same manner as physically held volumes, making coverage dates part of the display text for the URL link, relying on the resource itself to communicate holdings, or linking to an outside service (for example, Serials Solutions' e-journal portal). In addition to considering the preferred place to display the data, one must also consider which method will result in the most accurate, up-to-date data. Prominently displaying data that is inaccurate is not helpful to users.

Report Preparation and Follow-Up

During the process of conducting the evaluation, the team doing the work should arrive at specific recommendations to address the issues and problems that have been discovered. These recommendations should be recorded in a report to be submitted to library administration or others within the library who have the authority to make the decision to implement them. Because the online catalog is a primary tool used by library employees to carry out their daily work, it is also

a good idea to share recommendations with the organization as a whole. Face-to-face meetings are a good way to answer questions and get feedback on the recommendations from the organization. You may want to consider meeting with public services and technical services personnel separately, since their interests may be somewhat different. Technical services personnel may express concerns about the amount of work required to implement some of the recommendations. If that is the case, when meeting with public services personnel, review any recommendations that involve large maintenance projects or workflow changes to find out how important those recommendations are to them. If the changes are rated as important, it will justify the staff time involved in implementing them. If they are not rated as important, you may wish to reconsider some recommendations. Also, go over the wording of notes and display text to get specific feedback on them. Getting these details worked out in advance will facilitate implementation.

After collecting feedback, you may want to revise some recommendations and resubmit them for a final decision. If the recommendations are not approved exactly as written, the evaluation team or library administration will want to issue a revised report to reflect what was ultimately decided as a guide for those participating in the implementation.

Implementation and Follow-Up

While a discussion of the implementation of recommendations made at the UW Libraries is not the topic of this paper, a few points warrant inclusion here. The evaluation process should not end with the issuance and approval of recommendations. As recommendations are implemented, a follow-up assessment should make sure that the goals for each are achieved. Appropriate follow-up measures could include the use of focus groups or

other user studies, surveys of employees, or anecdotal evidence from public services personnel. For recommendations that can be implemented quickly, the evaluation team itself may be able to assess the results of the changes and perhaps make recommendations for further fine-tuning. Other recommendations may take months or even years to implement, particularly if retrospective conversion of data is involved. Reviewing a set of sample records as an early phase of the implementation is one means of assessment that will allow fine-tuning to occur before too much manual updating is done in a data-conversion project.

Recommendations

Guidelines for Conducting an Effective Project

In addition to the evaluation process outlined above, other general issues should be kept in mind during the project. Clear, meaningful communication between the evaluation team, the library administration, and the organization should be a high priority. Be sure to get all directives from library administration in writing and make them available to the organization. That will make expectations clearly known to all parties involved in the project. Open channels of communication within the organization during such a project will keep personnel informed about how the process is progressing, as well as allow opportunities for input that can create a level of buy-in during the change process. Depending on the nature of the recommendations, some may take months or even years to bring to fruition. For long-term communication needs, a wiki or blog for internal use may be a good tool to implement.

Despite the evaluation team's best intentions, organizations usually have some people who are resistant to making changes. Pleasing every employee will be impossible, so remember that proj-

ect success is about making the online catalog better for external users.

Synchronizing the evaluation with other organizational changes and projects, if they could affect the ability to implement recommendations in a timely fashion, is important. Unforeseen circumstances are always a possibility. If several recommendations affect the work of a particular unit or department, you should prioritize them to insure that the most important issues are addressed first.

Broader questions of library policy may arise as a result of the process. Additionally, issues tangential to the serials evaluation may be discovered by or brought to the attention of the evaluation team. The team will need to establish some boundaries regarding what falls within the jurisdiction of the project. It is good practice to document any problems or issues beyond the project's scope to share with relevant departments or library administration.

Guidelines for Writing an Effective Report

Writing an effective report requires more than assembling information. The following are suggestions for writing a successful report:

Be reader friendly. More than likely your report will be read by a variety of people at different levels of expertise when it comes to the technical details of your ILS, MARC records, cataloging standards, and so on. Try to avoid using jargon. Make the report easy for everyone to read and understand by using plain English.

Be clear and direct. State your main points clearly, and prominently. Do not let your recommendations get lost in the text of a long paragraph or be obscured by too many tangents.

Focus on results, not process. After all the time you have spent on research, discussion, and decision-making, you may be tempted to document a lot of your work in great detail. But do

not let the explanation of the process of doing your work overshadow the meat of your report, specifically your recommendations. Limit introductory materials to no more than a page. You should begin your report by stating what the charge or goal of your group is in simplest terms—do not assume everyone knows or remembers. For example, your group may have received a lengthy charge outlining your task, but try to boil this down to basic points (and include the full charge in an appendix if you deem it necessary).

Send your message at various levels of detail. Some readers will only want to scan the main points, while others will want to study every detail you provide. You need to cater to both of these groups. An executive summary can provide a succinct overview of recommendations. We numbered our recommendations, expressed each one in a single sentence, and presented the list at the beginning of the report. In the main body of the report, we repeated each recommendation, presenting the number and first sentence in bold, and then provided more detailed information for each. Throughout the report we used subheadings and bulleted or numbered lists to break up dense sections of text.

Include examples. Examples help to illustrate specifically what you are proposing, which is important in the visual medium of the online catalog.

Justify your recommendations. State what problems each recommendation is intended to solve and why changes need to be made. This will promote a better understanding of the issues within the organization. If the recommendations cannot be implemented as written, understanding what is driving them will be helpful in coming up with alternative solutions.

Conclusion

Libraries should strive to make serials information in the online catalog as

clear and easy to understand as possible. Conducting a user-focused evaluation is the first step in the process of making the online catalog more user friendly. Once recommendations have been made and approved, the next step is for the departments that will be doing the work to address implementation. If procedural efficiencies are at odds with what is best for users, a compromise between the two must be negotiated. As a final step, following implementation, collect user feedback to make sure the changes made have addressed the identified problems.

Conducting a periodic evaluation is good practice for libraries if they wish to keep their catalogs relevant. If a library is following international standards for bibliographic and holdings records, the full range of data entry issues may not need to be revisited very often. Local data, such as wording of notes, may be an exception, particularly if global change capabilities in an ILS are available to expedite maintenance. Since online catalog functionality is subject to periodic upgrades, data display issues should be revisited regularly to take advantage of any new features. Forming a standing committee charged with keeping abreast of changes to online catalog functionality, investigating problems, and conducting periodic user studies (or using other feedback mechanisms) is a good idea.

A review of the presentation of serials information in the online catalog can involve a lot of time and effort on the part of the evaluation team, as well as those charged with the implementation of recommendations. Some changes, such as those that are controlled by display settings in your ILS's software, may be relatively quick and easy to implement, resulting in immediate benefits to your catalog's users. Other changes may take longer to implement, such as retrospective data conversion, but represent a long-term investment in the data that the online catalog displays. Effective catalog displays are based on quality data that is

presented in a manner that is easy for users to interpret. Project success is ultimately measured by users finding the information they want and need in an efficient manner.

References

1. Barbara P. Pinzelik, "The Serials Maze: Providing Public Service for a Large Serials Collection," *Journal of Academic Librarianship* 8, no. 2 (1982): 89.
2. Wilma Reid Cipolla, "Finding a Way Out of the Serials Maze," *Library Resources & Technical Services* 32, no. 2 (1988): 151–58.
3. Ibid., 152.
4. Ibid., 152, 154.
5. Loanne Snavely and Katie Clark, "What Users Really Think: How They See and Find Serials in the Arts and Sciences," *Library Resources & Technical Services* 40, no. 1 (1996): 54.
6. Kathy Fescemyer, "Serials Clutter in Online Catalogs," *Serials Review* 31, no. 1 (2005): 14–19.
7. Ibid., 18.
8. International Federation of Library Associations and Institutions (IFLA), Task Force on Guidelines for OPAC Displays, *Guidelines for Online Public Access Catalogue (OPAC) Displays* (Munich: K.G. Saur, 2005).
9. Joan M. Cherry, "Bibliographic Displays in OPACs and Web Catalogs: How Well Do They Comply with Display Guidelines?" *Information Technology & Libraries* 17, no. 3 (1998): 124–37.
10. Mary Ellen Clapper, "Serial Holdings Standards," *Serials Librarian* 11, no. 3/4 (1986–87): 111–35; Marjorie E. Bloss, "The New! The Improved! Standard for Serials Holdings Statements," *Library Resources & Technical Services* 31, no. 1 (1987): 24–34; Frieda B. Rosenberg (workshop leader) and Cathy Kellum (recorder), "Do Holdings Have a Future?," *Serials Librarian* 36, no. 3/4 (1999): 529–39; Frieda Rosenberg and Mary Ann Van Cura (presenters) and Kathryn D. Ellis (recorder), "Understanding the MARC Format for Holdings Data (MFHD)," *Serials Librarian* 40, no. 1/2 (2001): 7–18; Shirley Lincicum, "An Introduction to Holdings Standards," *Computers in Libraries* 24, no. 2 (2004): 10–16.
11. Barry B. Baker, "Panacea, Patterns and Problems: Implementation of the USMARC Holdings Format at the University of Georgia Libraries," *Technical Services Quarterly* 9, no. 3 (1992): 31–39; Gail McMillan, "Retrospective Conversion of Serials: Implementing the MARC Holdings Format," *Technical Services Quarterly* 9, no. 3 (1992): 41–54; Marilyn Quinn and Gracemary Smulewitz (workshop leaders) and Shelley Neville (recorder), "Implementing and Appreciating the MARC Holdings Format," *Serials Librarian* 40, no. 3/4 (2001): 343–48; Robert Alan, "MARC Holdings Implementation: A Long-Term Process with Long-Term Advantages," *Library Collections, Acquisitions, & Technical Services* 27, no. 1 (2003): 107–20; Diane Hillman et al. (presenters) and Pat Loghry (recorder), "Implementing MARC 21 for Holdings," *Serials Librarian* 44, no. 1/2 (2003): 5–9; William Anderson, "The Library of Congress Serials Holdings Conversion Project," *Serials Librarian* 49, no. 1/2 (2005): 211–40; Kalyani Parthasarathy, "Serials Holdings Conversion Project at the University of New Orleans' Earl K. Long Library: An Outsourcing Experience," *Louisiana Libraries* 69, no. 1 (2006): 12–15.
12. Alan, "MARC Holdings Implementation," 107.
13. Patricia M. Wallace, "Serials Holdings Statements: A Necessity or a Nuisance?" *Technical Services Quarterly* 14, no. 3 (1997): 11–24.
14. Ibid., 12–13.
15. Baker, "Panacea, Patterns and Problems," 34.
16. Paul Moeller and Wen-ying Lu, "MARC 21 Format for Serials Holdings: A Survey on the Acceptance and Use of Standards," *Serials Review* 31, no. 2 (2005): 90–102.
17. Ibid., 98.
18. Tyler Goldberg and Eric Neagle, "Serials Information in the OPAC: A Model for Shared Responsibility," *Serials Review* 22, no. 4 (1996): 55–63.

19. Ibid., 63.
20. Charles R. Hildreth, "Online Catalog Design Models: Are We Moving in the Right Direction?" Aug. 1995, www.ou.edu/faculty/H/harles.R.Hildreth/clr-opac.html (accessed May 15, 2007).
21. David H. Thomas, "The Effect of Interface Design on Item Selection in an Online Catalog," *Library Resources & Technical Services* 45, no. 1 (2001): 20–46.
22. Ibid., 21.
23. Allyson Carlyle and Traci E. Timmons, "Default Record Displays in Web-Based Catalogs," *Library Quarterly* 72, no. 2 (2002): 179–204.
24. Ibid., 201.
25. Cherry, "Bibliographic Displays," 135–37.
26. IFLA, *Guidelines*, 15.
27. Jim Cole, "Impacts of the Abandonment of Catalog Records for Electronic Serials," *Serials Librarian* 45, no. 1 (2003): 27–33.
28. Ibid., 33.
29. Peter McCracken, "Beyond Title Lists: Incorporating Ejournals into the OPAC," *Serials Librarian* 45, no. 3 (2003): 101–8.
30. Ibid., 103.
31. Wayne Morris and Lynda Thomas, "Single or Separate OPAC Records for E-Journals: The Glamorgan Perspective," *Serials Librarian* 41, no. 3/4 (2002): 97–109.
32. Ibid., 100.
33. Vera Giles, "Single or Multiple Records for Print and Electronic Serials Titles: When Less Is More (More or Less)," *Serials Librarian* 45, no. 1 (2003): 35–45.
34. Ibid., 41.
35. Abigail C. Bordeaux, "Single, Separate, or Something in Between: Results of a Survey on Representing Electronic Serials in the Catalog," *Journal of Internet Cataloging* 7, no. 3/4 (2004/2005): 37–48.
36. Ibid., 42.
37. Chris Oliver, "FRBR is Everywhere, But What Happened to the Format Variation Issue?: Content versus Carrier in FRBR," *Serials Librarian* 45, no. 4 (2004): 27–36.
38. Ibid., 33.
39. Ibid.
40. Ibid., 34–35.
41. Ibid., 35.
42. Julian Everett Allgood, "Serials and Multiple Versions, or the Inexorable Trend toward Work-Level Displays," *Library Resources & Technical Services* 51, no. 3 (2007): 160–78.
43. Ibid., 165.
44. Ibid., 166.
45. Ibid., 175.
46. Thomas Mann, "The Peloponnesian War and the Future of Reference, Cataloging, and Scholarship in Research Libraries," Aug. 1995, 4–5, www.guild2910.org/Peloponnesian%20War%20June%2013%202007.pdf (accessed June 21, 2007).
47. Thomas Mann, "The Changing Nature of the Catalog and Its Integration with Other Discovery Tools. Final Report. March 17, 2006. Prepared for the Library of Congress by Karen Calhoun: A Critical Review," 7, www.guild2910.org/AFSCMECalhounReviewREV.pdf (accessed June 21, 2007).

Book Reviews

Edward Swanson

FRBR: A Guide for the Perplexed.
By Robert L. Maxwell. Chicago: ALA,
2008. 151p. $50.00 ($45.00 ALA mem-
bers) paper (ISBN 978-0-8389-0950-8
/0-8389-0950-7).

***Understanding FRBR: What It
Is and How It Will Affect Our
Retrieval Tools.*** Ed. Arlene G. Taylor.
Westport, Conn.: Libraries Unlimited,
2007. 186p. $45.00 paper (ISBN 978-
1-59158-509-1/1-59158-509-0).

FRBR (Functional Requirements
for Bibliographic Records) has been
around for awhile (the final report
of the International Federation of
Library Associations and Institutions
[IFLA] Study Group was published
in 1998) and most of us in the library
world have at least heard of it.[1] FRBR
literature continues to grow, with
analyses, explanations, and reports on
research; experimentation is taking
place, and we are seeing some adapta-
tion of FRBR-like concepts in database
search displays. But many of us cannot
say that we truly grasp FRBR. We
remain unenlightened, confused, or
unconvinced, and this is likely because
it has not yet affected our world in
any significant way. Very few library-
system vendors have undertaken a full-
scale conversion to FRBR, and we still
await the new cataloging code (RDA)
that will incorporate FRBR concepts.
These two new books on FRBR go a
long way toward helping both cata-
logers and noncatalogers understand
FRBR and how it can significantly
improve access to information.

Robert Maxwell's *FRBR: A Guide
for the Perplexed* is the best expla-
nation I have seen of FRBR as an
example of the database-modeling
technique called entity-relationship. I
suddenly understand things that had
remained inscrutable before. Maxwell

is thorough and refreshingly compre-
hensible in explaining what an entity-
relationship model is, where it came
from, and why it is good for an online
environment. He emphasizes the rela-
tionships as much as the entities to
fully explain what the FRBR model is
trying to do.

Maxwell also explains FRBR in
relation to our current cataloging uni-
verse. He points out how FRBR can or
cannot be applied, without changes, to
our current online catalogs and our cur-
rent cataloging rules. This is especially
true in the chapter on relationships
where he describes how each relation-
ship is brought out in the AACR2/
MARC environment and then how it
might work, often more clearly and
efficiently, in an FRBR environment.

Functional Requirements for
Authority Data (FRAD) concepts and
examples are included throughout,
and I found this particularly helpful to
get a fuller grasp of how the two mod-
els might work together. Also, Maxwell
is always careful to cite FRBR and
FRAD sections and pages for those
who wish to refer back to the FRBR
Report and the FRAD 2007 draft.[2]

The examples and diagrams con-
tribute greatly to explaining the FRBR
concept. In fact, Maxwell uses both
FRBR and entity-relationship dia-
gramming, and the entity-relationship
diagrams are often better and more
complete than the FRBR ones.
This helps to point out some of the
problems with FRBR. And, indeed,
Maxwell is not shy about bringing up
issues and limitations of FRBR that
will need to be worked out before
there can be full adaptation of the
model. Among other things, Maxwell
feels that some of FRBR's problems
arise where the FRBR model deviates
from the entity-relationship model.

For example, he shows how the model
would be cleaner if it allowed for attri-
butes to be defined for relationships as
well as for entities, as is the case in the
entity-relationship model.

Maxwell concludes by saying
that, despite the "daunting task" of
transforming our MARC records into
FRBR entities and relationships, the
advantages to converting to FRBR-
based entity-relationship databases are
without question.

In case one did not realize this
before, Maxwell's book makes it clear
that FRBR is not just for catalog-
ers. *Understanding FRBR: What It Is
and How It Will Affect Our Retrieval
Tools*, edited by Arlene G. Taylor,
reinforces this and explicitly states in
the introduction, "It is hoped that the
book will be of interest to people who
are not cataloging specialists, as well as
to those who are" (vii).

Understanding FRBR is a col-
lection of thirteen discrete chapters
by thirteen authors, all of whom are
known either for their FRBR work or
as experts in their library field. The
thirteen chapters do not necessar-
ily hang together except by virtue of
advancing the reader's understanding
of FRBR.

The progression of chapters
moves from what FRBR is (Arlene G.
Taylor) and what FRAD is and how it
relates to FRBR (Glenn E. Patton),
to considerations of general aspects
of FRBR and its place in the his-
tory of cataloging (William Denton),
the role of research in its develop-
ment (Edward T. O'Neill), the concept
of bibliographic families (Richard P.
Smiraglia), and FRBR's incorporation
into RDA (Barbara B. Tillett). (It
should be noted that Tillett has writ-
ten a partial update to her chapter to
reflect the recent reorganization of

RDA.[3]) The last six chapters investigate the application of FRBR in specific environments or with specific formats: archives (Alexander C. Thurman), art (Murtha Baca and Sherman Clarke), cartographic materials (Mary Lynette Larsgaard), moving image materials (Martha M. Yee), music (Sherry L. Vellucci), and serials (Steven C. Shadle).

Among the first seven chapters, two are of special note: Smiraglia's and Denton's.

Smiraglia's "Bibliographic Families and Superworks" gives us the benefit of his previous research on knowledge organization. He discusses the phenomenon of "constellations of works" that form around an original work. He calls these "bibliographic families—groups of works that share common intellectual content." (73). He sees FRBR working much better than our current use of the uniform title heading to collocate the generations and siblings of these families.

My favorite chapter, one that would appeal to anyone (possibly even nonlibrarians), is Denton's "FRBR and the History of Cataloging." In a light, narrative tone, he explains where FRBR comes from by following four ideas through modern Anglo-American library history. One of those ideas is that of the "work," and that sets us up nicely for the discussions of the work entity in many of the other chapters. He includes an extensive bibliography, a helpful and welcomed addition to his chapter. (It would have been good if all the authors had done the same.)

Denton is careful to point out that FRBR is *an* end point, not *the* end point, "of almost 175 years of thinking about what catalogs are for and how they should work" (35). We are on a continuum here, and many of the chapters, especially those analyzing FRBR in light of specific disciplines and formats, point out the limitations of FRBR and the need for refinements. Yee (moving images), Vellucci (music),

and Shadle (serials) present the fullest, most complex analyses. They understand the potential of FRBR and are eager to contribute to its interpretation and application. In fact, for each, their chapters reflect their considerable previous work on FRBR in their areas of specialization.

The FRBR model is print (and to a lesser extent music) centric. If it considers archives, cartographic materials, or art objects at all, it is only minimally. As the three chapters covering these areas point out, this is one of the greatest limitations of FRBR. Despite this, Baca and Clarke, in their chapter on "FRBR and Works of Art, Architecture, and Material Culture," show a willingness to consider FRBR, especially the aspect of relationships. On the other hand, both Thurman (archives) and Larsgaard (cartographic materials), see that FRBR in its current form does not apply to their fields, so they do not explore FRBR's potential.

As O'Neill reminds us in his chapter on FRBR research, "FRBR is not a fully developed model but rather a model that requires continuing refinement, interpretation, and development" (61). We are reminded of this repeatedly in both books. Maxwell weaves his own interpretations and suggestions for improving the model throughout his book, and these enhance his presentation of FRBR's goals. Likewise, many improvements are proposed in *Understanding FRBR,* most especially by Yee, Vellucci, and Shadle. We are able to learn not just what FRBR is, but also what its potential strengths are, and this gives us a more well-rounded understanding of the concepts.

I would recommend both of these books to any librarian who wants to learn more about FRBR. Maxwell's comprehensive overview is the stronger of the two, and would be an excellent starting place. Although *Understanding FRBR* has some weak areas, it does have many fine chapters,

and overall it contributes important insights into the conceptual model we call FRBR.—*Virginia Dudley, (v-dudl@umn.edu), MINITEX Library Information Network, Minneapolis, Minn.*

References

1. International Federation of Library Associations and Institutions (IFLA) Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records, Final Report,* UBCIM Publications, New Series, vol. 19 (München: K. G. Saur, 1998), www.ifla.org/VII/s13/frbr/frbr .pdf or www.ifla.org/VII/s13/frbr/frbr .htm (both accessed Apr. 8, 2008).

2. IFLA Working Group on Functional Requirements and Numbering of Authority Records (FRANAR), *Functional Requirements for Authority Data: A Conceptual Model,* Draft 2007-04-01, www.ifla.org/ VII/d4/FRANAR-ConceptualModel -2ndReview.pdf (accessed Apr. 8, 2008).

3. Barbara B. Tillett, "Update to Chapter 7, FRBR and RDA: Resource Description and Access," (2008) http://lu.com/FRBR (accessed Apr. 8, 2008).

E-Metrics for Library and Information Professionals. By Andrew White and Eric Djiva Kamal. New York: Neal-Schuman, 2006. 250 p. $75.00 paper (ISBN 1-55570-514-6).

Going by articles in library literature, postings on e-lists, and blogger comments, library users seem to have an insatiable appetite for electronic information. Reports from the Pew Internet and American Life Project and industry data from search engine providers substantiate increasing use of the Internet each year. Users seek information first from their computers using Web search engines, and libraries are increasing the number of electronic resources they are providing because of what is often characterized as user demand. But are libraries providing the right resources?

Expenditures for electronic resources are also increasing by leaps and bounds. As reported by the Association of Research Libraries (ARL) in its *ARL Statistics 2004–2005,* "in every year of the last decade electronic materials expenditures have grown sharply, anywhere between three and ten times faster than materials expenditures have. The average ARL university library now spends more than 37% of its materials budget on electronic resources . . . and fifteen ARL libraries report that they spent more than 50% of their materials budget on electronic materials."[1] But if libraries are spending a significant portion of their materials funds on electronic information, are they getting value for their money?

White and Kamal's book is a way for libraries to begin the process of determining if they are providing the right electronic resources and if they indeed are getting value for their money. The subtitle of the book, "How to Use Data for Managing and Evaluating Electronic Resource Collections," indicates that the authors are taking a practical approach to the measurement of the use of electronic information in a library. But before they begin to address the management and evaluation portion, the authors first review some terminology. For purposes of their book, the authors define e-metrics as referring to "both the electronic format of collected metrics and to the methods used for gathering metrics through electronic means" (5). Since libraries are putting more of their dollars into electronic resources and technologies can provide the tools to analyze use, the authors have written what might be characterized as a textbook for those who are looking for tools and techniques that would help them gather data to support their significant investment into electronic resources.

The first three chapters provide an overview of e-metrics by giving a brief history first of their use in commerce, in particular, then of how they came about as a method of measurement in libraries. Chapter 3 focuses on vendor-supplied data, identifying both pros and cons. Those familiar with current efforts to bring consistency to definitions of terminology and comparability among vendor usage reports will, no doubt, find some of this information dated, since the industry changes rather rapidly. Still, the exhortation for the development and use of standards made by the authors in this chapter and throughout the rest of the book is a welcome reminder that there is still much left to be done to make these data easy to manipulate.

The second section of the book addresses how e-metrics can be applied by different departments within the library: public relations, collection management, and library administration. How these individual chapters are organized and focussed is helpful because it demonstrates how data can be presented to provide useful information for those who may have a different focus or purpose to their work. The approach taken for most of these chapters is a question-and-answer examination together with tables showing results from three library categories. This leads to an increased understanding of how data can address common library issues. Readers should be sure to review all of the chapters, since the selection of data to present for each department would differ from library to library.

Building a local infrastructure to manage e-metrics is the focus of the last section of the book. The authors provide practical advice on capturing data, setting up the technical support, and staffing the operations. Some readers may find the technical aspects more than they want to know, but it is important for libraries today to invest in some technical support for electronic data management, since significant resources are going into electronic collections. The authors' advocacy for an overall electronic resources management operation is apparent in this section. Again, that may be more than some libraries wish to invest at this time.

The chapter on staffing is an especially important chapter, since most institutions need to think carefully about organizational issues as they begin any e-metrics management program. Although not obvious from its title, this chapter also includes a good section about setting policies both for processing the data and protecting users that could have been placed as a separate chapter to give it more visibility.

In the final chapter, the authors speculate on future issues in technology and again come back to the importance of standards.

There are several strengths to this book. The authors include a great many examples to help the reader. Multiple tables in each chapter highlight points made in the text. Another nice set of features is the overview, notes, and conclusion sections for most chapters. For those who wish to do some simple programming, two of the appendixes include actual scripts.

The bibliography is comprehensive. Readers not familiar with all the activities surrounding e-metrics will find a thorough introduction, and those who have been monitoring and participating likely will find something they have missed. The latest references in the book are from 2004, however, and efforts to standardize e-metrics definitions to make data processing easier are ongoing. For example, the Counting Online Usage of NeTworked Electronic Resources Project is referred to many times in the book, and updated releases of its Codes of Practice and vendor-compliance lists have occurred since the book was written. Also, while the index is very good, a glossary would have been helpful, since many acronyms, initialisms, and terms are used throughout the book that are

introduced in one chapter but not explained in others.

While the book is well-written and well-edited, it does have a technology focus. Even if examining a sample log file is not of interest, the book's main contribution is its overview of all of the issues surrounding electronic-resources measurement.

White and Kamal have many years of experience in information technology and have written a clear guide for those who wish to begin the process of managing data to support their decision-making regarding electronic resources. It will help libraries begin to answer the questions: Are we buying the right resources? Are we getting value for our money?—*Julia C. Blixrud, (jblix@arl.org), Association of Research Libraries.*

Reference

1. Martha Kyrillidou and Mark Young, comps. and eds. *ARL Statistics 2004–2005* (Washington, D.C.: ARL, 2006), 20.

Archives and the Digital Library. Eds. William E. Landis and Robin L. Chandler. Binghamton, N.Y.: Haworth Information Press, 2006. 270p. $65.00 paper (ISBN 978-0-7890-3438-0); $85.00 cloth (ISBN 978-0-7890-3437-3).

William E. Landis and Robin L. Chandler have gathered together a noteworthy and diverse collection of writings from the *Journal of Archival Organization*. One can surmise from this book that the ever-evolving digital library landscape requires active contribution from archivists and multiple stakeholders, including grant-funding agencies, digital library service providers, and cultural heritage institutions. The overall focus of the text is a case-by-case study of collaborative efforts designed to enhance efficiency and standardization into the digital object management process. While archivists have a distinct expertise, the traditional means of administration

for archival and special collections no longer meet the requirements of our users. As digital library projects move forward, the scope of challenges and opportunities are considerable. From the book, we gain extensive knowledge into the methods used for finding solutions to the numerous questions we face concerning technical infrastructure, how to sustain multiple formats, and long-term preservation. Ultimately, the goal of all stakeholders is to provide greater access to their digital collections. Taking user needs into account is a significant part of the digital library development course of action. Collaboration and partnerships serve as foundational concepts for the implementation of numerous digital initiatives throughout the text. Each case study illustrates a high degree of synergy among colleagues.

The book is divided into three sections, "Developing Non-Licensed Content," "Usability Issues and Options for the End User," and "Technology, Preservation, and Management Issues." The first section gathers three textual illustrations where the California Digital Library, a well-respected organization that facilitates the formation and execution of digital library projects, was involved. "Committing to Memory: A Project to Publish and Preserve California Local History Digital Resources" discusses best practices dealing with topics including budgeting, selection, workflows, scanning, digital library management software, digital asset creation tools, metadata standards, staff training, outsourcing, data transformation, and metadata harvesting. One of the most valuable characteristics of the book is its inclusion of step-by-step decision-making procedures for each digital library initiative. In "Technology Enhanced Archival Collections: Using the Buddy System" the author notes that eligibility for grant funding includes digitization as one prerequisite for many archival institutions. The focal points of this

resource concentrate on the strategic action of identifying potential collaborators and resources and the provision of sustainable and user-friendly digital access. This case study makes team building and finding expertise outside of traditional library circles a priority. "California Cultures: Implementing a Model for Virtual Collections" addresses key decisions in the creation of a virtual collection while updating search and retrieval systems. Once again, the transition into a system with greater functionality based on best practices and guidelines is well documented.

As digital library initiatives gain momentum, our primary aspiration is to serve the best interests of our users. The secondary division of articles stresses the pursuit of both quantitative and qualitative data to analyze the needs of our consumers. The four key methodologies used throughout the three examples are focus groups, interviews, questionnaires, and usability testing. "The Importance of User-Centered Design: Exploring Findings and Methods" addresses the user-centered design philosophy that calls for user involvement in all stages of project development: planning, implementation, and post-project evaluation. The advantages and disadvantages of using each methodology can be extremely beneficial to any digital library initiative in the evaluation process. "How and Why of User Studies: RLG's RedLightGreen as a Case Study" continues the focus on user-centered design to facilitate "product design, usability testing and market research" (87). This article utilizes the following methodologies to research user needs: usability, focus groups, interviews, ethnographic studies, and weblog analysis. "From Horse-Drawn Wagon to Hot Rod: The University of California's Digital Image Service Experience" promotes collaboration and partnership among archivists and digital libraries to tackle collection development, system functionality, workflow, image manage-

ment, and patron usability issues. All of the lessons learned will benefit readers by increasing their knowledge base.

The final section, which contains five articles, delves deeply into the complexities of access and preservation for nonprint-medium formats, in particular Web sites and audiovisual digital objects. "Archiving Web Sites for Preservation and Access: MODS, METS, and MINERVA" is a case study that explores the best methods for archiving born digital materials, which have unpredictable and short life spans. Cooperative partnerships continue to be the key to success in this collection of writings. "Video Preservation and Digital Reformatting: Pain and Possibility" covers the alliance between digital libraries and preservationists to build a sustainable model for the digitization of the video-formatted moving image. The primary challenges are instability in media formats and obsolete technology. The article discusses the validity of digital reformatting as a viable preservation method and the ongoing challenge of creating user-designed metadata. "Digital Archiving and Preservation: Technologies and Processes for a Trusted Repository" offers a new perspective on the idea of "trusted digital repositories" (193). In the digital service model, scholarship, authenticity, reliability, and persistence over time represent trust in a digital system. "The Complexities of Digital Resources: Collection Boundaries and Management Responsibilities" highlights the difficulty of managing and producing collection development policies for unpredictable changes in content, specifically digital course content and faculty papers. The last article, "The Archivist's Toolkit: Another Step Toward Streamlined Archival Processing" serves as an example of how collaborative efforts throughout the text can lead to improved functionality and procedures community wide. The Archivist's Toolkit is an open source system for managing

archival data in a single, integrated software application. With more streamlined and efficient archival processing, established standards and best practices can be developed, leaving time to shift focus to new goals and objectives.

This book may prove enormously valuable to leaders, collaborators, and novices contributing to digital library initiatives. The sheer number of case studies provides a comprehensive overview of digital access and preservation issues for different material formats. The detail oriented nature should prove beneficial to archivists whose positions are evolving as academic libraries and cultural heritage institutions restructure and create strategic plans for providing digital access to its patronage. Within the archival and library communities, we can definitely learn from sharing information highlighting such distinct digital library initiatives. There is no need to reinvent the wheel with each new digital project when the groundwork has been established in various institutions. *Archives and the Digital Library* clearly shows how to shape and implement digital library services for our target audiences.—*Shantrie Collins, (scolli24@utk.edu), University of Tennessee, Knoxville.*

Cataloger, Editor, and Scholar: Essays in Honor of Ruth C. Carter. Ed. Robert P. Holley. Binghamton, N.Y.: Haworth Information Press, 2007. 417p. $75.00 hard (ISBN 978-0-7890-3622-3).

Ruth C. Carter has had a wide-ranging and diverse career; thus it is fitting that this festschrift published to honor her twenty-year editorship of *Cataloging and Classification Quarterly* (*CCQ*) should include a wide-ranging and diverse array of contributions. It is also fitting that this volume should be reviewed in *Library Resources and Technical Services,* the official publication of the Association for Library Collections and Technical

Services (ALCTS), because Dr. Carter's major professional association service has been through ALCTS (15). She served on numerous ALCTS committees; she served as chair-elect, chair, and past chair of the Serials Section from 1984 to 1987; and she was president of the association itself in 1991.

The editor, Robert P. Holley, has managed to organize all this heterogeneity into four sections: "Part I: In honor of Dr. Ruth Carter," "Part II: Historical Studies," "Part III: Research Studies," and "Part IV: Position Papers."

The initial paper in part 1 was written by Carter's cataloging professor at the University of Illinois at Urbana-Champaign, Kathryn Luther Henderson. Henderson summarizes Carter's career beginning with a year of middle school teaching and two years as a computer systems analyst for the U.S. Army. When she entered library school, her intention was to become a reference librarian. After meeting the challenges of Henderson's basic cataloging class, followed by her advanced-cataloging class, with its introduction to serials cataloging, Carter's career plans changed. But, as Carter herself always emphasized, technical services are also user services (10). Her first job as a librarian was head of technical services and automation at Parkland College om Illinois. Carter next held a series of positions at the University of Pittsburgh Libraries between 1972 and 1999. In 1993 she earned her Ph.D. in history from the University of Pittsburgh. Her final position at Pittsburgh was as head of the Archives Service Center and curator of historical collections.

Carter was active in other professional associations in addition to ALCTS. Beginning in the early 1970s she was involved with OCLC, particularly in the areas of serials control and union listing (11). She served for more than a decade on the Cooperative Online Serials (CONSER) Policy

Committee. In 1986 the American Library Association awarded her the Bowker/Ulrich's Serials Librarianship Award for distinguished contributions to serials librarianship. From 1991 to 1999 she served as a member of the standing committee of the Serials Section of the International Federation of Library Associations and Institutions (IFLA).

Henderson's summary of Carter's career, research, and publications is followed by Linda C. Ewbank's interview with Carter. The final article in part 1 reviews the contents of *CCQ*, 1990–2006. This article updates an article coauthored by Carter in 1991 statistically analyzing the contributors, editors, and changes in emphasis of topics in *CCQ* during its first ten years of publication.

The historical studies in part 2 comprise the most eclectic section of the book. They include a history of books and reading in pre-1850 Monroe County, Indiana; an article on the lost art of annotation in cataloging; a history of bibliographic-control research at the University of Bradford in Leeds, England; and an examination of Italian cataloging rules and traditions.

In parts 3 and 4 contributors write about some of the issues that are widely discussed in librarianship today. Rather than trying to summarize the contents of all thirteen articles, I will mention selected articles that relate to these issues. An overarching theme that can be stretched to include almost all the articles in these two sections is the value of technical services work, particularly cataloging.

The opening article of part 3, by Janet Swan Hill, fits easily into this theme because she explores the impediments to the achievement of tenure for technical service librarians in academia. Not surprisingly, she argues that the work of technical services librarians is no less critical to the success of libraries than the work of those interacting directly with the users. She recommends several strategies, such as having an effective description of the job. Her survey participants stressed that the position description should "focus on the end product and the impact on library users" and "emphasize the enduring aspect of what we do (bib records and authority records last a very long time in databases) and also the impact (international database)" (166). Another strategy is to have performance-assessment criteria "expressed in terms of such attributes as timeliness, effectiveness, thoroughness, independence, creativity, contribution, mastery, flexibility, and service" (167).

Robert L. Bothmann is the author who addresses the value of cataloging most directly. In the introduction to his study of the education and professional development needs of special format catalogers, he writes,

> Without proper cataloging and classification, collection development librarians would not be able to ascertain strengths or weakness within a collection; serials librarians would be unable to locate preceding or succeeding or ceased journals; instruction librarians would be unable to teach users how to access materials; and reference librarians would be unable to locate resources that could aide a patron. Without a proper catalog, a library is nothing more than a building full of books with no map to guide the user to the resources. (222)

Bothmann's views contrast sharply with the general tenor of Karen Calhoun's much-discussed report, which states, "Many considered the greatest challenge librarians' own narrow views and lack of vision."[1] She continues by stating that catalogers need to "build new professional skills"—presumably skills in non-MARC metadata creation. With her usual good sense, Martha M. Yee's contribution to this collection describes just exactly what is meant by cataloging as opposed to other bibliographical activities, such as the creation of metadata. She defines cataloging as

> "the creation of catalogs;" and a "catalog" is defined as: a guide to a particular collection or aggregate of collections created using standards that govern both the choice and the labeling of data in such a way as to result in the choice of preferred names for authors, works, subjects, and disciplines, with provision for access under variant forms, such that a user who searches under any variant is led to everything of interest (all works on the subject sought, or all works by the author sought, or all editions or expressions of the work sought). In any given catalog record, sufficient data is recorded to allow a user to identify and distinguish one edition or expression from another and to select a desired work or expression of a work. (308–9)

For her description of metadata, Yee relies on D. Grant Campbell: "Metadata is not designed or created by a specially-trained cohort of professionals who have a specific skill set and a common slate of objectives" (320).

Although these articles were written before the Library of Congress Working Group on the Future of Bibliographic Control was even charged in November 2006, some of the authors discuss issues that appear in the group's final report. For instance, the working group's report says "LC enjoys neither a mandate to be a national library, nor funding concomitant with playing such a role."[2]

Further in the report, the working group recognizes that "many information resources formerly managed in the not-for-profit sector are now the objects of a significant for-profit economy."[3] The group recommends that, in the absence of sufficient funding, LC work toward "divestment" of its role of "sole provider of bibliographic data. . . . The goal should be that of LC's deriving increasing benefit from the work of other libraries."[4]

Elizabeth N. Steinhagen, Mary Ellen Hanson, and Sharon A. Moynahan discuss these same issues even more trenchantly:

> Library administrations now look to outsourcing of cataloging as a way to reduce personnel costs. . . . Even the Library of Congress (LC) began "outsourcing" LC-quality original cataloging through programs such as BIBCO, NACO, and CONSER. No longer able [to] afford its de facto role as a national cataloging agency, LC has shifted some of the burden for quality records to a wide range of catalogers in public, academic, and research libraries. These efforts in shared cataloging provide real benefits for many libraries but at increased expense to contributing libraries that receive less than $5.00 credit from a utility for a record that might cost up to $30 [to] $50 to create in-house. In effect, shared cataloging has become the gift of these libraries not only to the library community but also to vendors, who advertise the cost savings of purchasing this "shared" cataloging via outsourcing. Library directors relying on outsourcing may forget that *someone* had to create those records originally." (275)

This entire collection is rich is insights such as these. Although reading a text of 417 pages might seem like a major undertaking, I found enough stimulation and variety that I completed it much more quickly than I had expected. Particularly enjoyable was learning about the career of a great technical services librarian, Dr. Ruth C. Carter—*Sue Wartzok, (swartzok @fiu.edu), Florida International University, Miami.*

References

1. Karen Calhoun, *The Changing Nature of the Catalog and Its Integration With Other Discovery Tools,* report to the Library of Congress, 2006, 42, www.loc.gov/catdir/calhoun-report -final.pdf (accessed Apr. 8, 2008).
2. *On the Record: Report of the Library of Congress Working Group on the Future of Bibliographic Control* (Washington, D.C.: Library of Congress, 2008), 6, www.loc.gov/lcwg -ontherecord-jan08-final.pdf (accessed Apr. 8, 2008).
3. Ibid., 11.
4. Ibid., 12.

Handbook of Electronic and Digital Acquisitions. Ed. Thomas W. Leonhardt. N.Y.: Haworth Press, 2006. 160p. $24.95 paper (ISBN 978-0-7890-2292-9); $34.95 cloth (ISBN 978-0-7890-2291-2).

The title of this book is a bit ambiguous and, depending on your interpretation, you will find it either a slender compilation about the acquisition and implementation of various electronic products and procedures in the library or a book about the acquisition of electronic resources that includes some tangentially related chapters about virtual reference and electronic data interchange (EDI) with vendors. If the latter, then there are also some obvious and fairly big holes in the content, i.e., e-acquisitions issues that demand coverage (or fuller coverage) in any handbook claiming to treat the topic in any kind of dedicated way. The editor's preface

implies that the former is intended and, in that case, the reader has a highly selective book on an almost impossibly broad topic: are there *any* procedures in the library these days that are not somehow influenced by electronic technology?

The editor's approach has not been to present a sprawling overview, with easily three or four times as many chapters as are included in this compilation, and to hope (and plan) that a coherent and comprehensive treatment would be the result. Instead, there are seven broadly themed chapters that cover some of the basics (acquisitions generally, collection development, selection, copyright and fair use, electronic reserves, aggregated databases, virtual reference, and electronic data interchange [EDI]). The individual chapters were written by different authors, and there is the inevitable overlap of coverage, but this is not a huge problem. If the reader is expecting a book about the acquisition of electronic resources, then there are two chapters that do not really seem to belong: "Choosing Virtual Reference Software" presents some useful information, and "Electronic Data Interchange and Vendors" is about a specific aspect of acquisitions generally.

More importantly, though, is that there are some major topics that are *not* covered to any great extent in the book, for example, e-books, electronic resource management (ERM), and licensing. It is true that these topics have already been covered in several other articles and book chapters, and in blog postings and other sites on the Web—and in whole books themselves—but any handbook should devote some attention to them as well. The two chapters on collection development deal with databases and electronic journals. Those are important information resources for libraries, of course, but e-books present unique challenges of all sorts that have not been written about nearly as much as other electronic resources. As for the

other two topics, ERM and licensing, they are core to the whole practice of electronic acquisitions.

Many topics, however, are well covered in this handbook; in fact, ignoring issues of what the title means and what should or should not be included, what *is* included in this book is generally well written and highly informative. Linda Neyer's chapter, "Copyright and Fair Use: Electronic Reserves," is both succinct and comprehensive, covering this broad and complicated issue in a clear style, and also providing practical advice for institutions across a wide variety of types. The chapter has an appendix listing Web sites that deal with various aspects of copyright and fair use. The chapter by Susan McMullen, Patricia B. M. Brennan, Joanna M. Burkhardt, and Marla Wallace on "Collection Development Strategies for Online Aggregated Databases" is also good, providing the necessary background on electronic collection development, defining its terms, and then presenting discussions of the main criteria to be used in evaluation.

One quibble, though, is that the section on accessibility and customer support covers only the help screens aspect of customer support, and that very briefly. This deserves lengthier attention because the degree of support—support that is provided by actual people in a timely manner, and not limited to e-mail or Web forms, but also making available a representative to talk live on the phone—that the vendor provides for a database or any electronic resource is a significant determinant of how valuable it is to the library and to the harried librarian who is doing the troubleshooting. The chapter is limited to aggregated databases, which is unfortunate because the book would have benefited from the same treatment applied to all kinds of e-resources. There are two other chapters on selection and collection development. Audrey Powers's "Evaluating

Databases for Acquisitions and Collection Development" presents some general guidelines and then concentrates on a case study at the University of Montevallo. Rickey D. Best's "Issues on the Selection of Electronic Resources" also contains some good general guidelines, but at times it presents overly detailed local information without generalizing to make it more useful for the reader.

If you concentrate on what is actually in this book and not worry about the lack (and the impossibility) of inclusiveness no matter how you read the title, there is much to recommend here. (By the way, what exactly is the difference between *electronic* and *digital* in that title?) Compilation books like this are a notorious challenge for the editor. If one chooses a narrow topic and is able to marshal people with solid work experience, a good head for the principles, and writing ability, then the result can be excellent. But if the topic is as broad as this one, then the readers can feel that they have tasted some good courses but not quite had a full meal.—*Wayne Jones, Queen's University, (jonesw@queensu.ca), Kingston, Ont.*

Open Access Bibliography: Liberating Scholarly Literature with E-Prints and Open Access Journals. By Charles W. Bailey. Washington, D.C.: Association of Research Libraries, 2005. 105p. $45.00 paper (ISBN 1-59407-670-7).

Open access has been gaining momentum lately, from the National Institute of Health's mandate to Harvard University's resolution on open access. Those wishing to learn more about the open access movement would be well served by turning to Bailey's *Open Access Bibliography*. A lot of material has been published about open access over the past few years, and Bailey has amassed more than 1,300 citations. They include a variety of sources, such as journal articles, newspapers, conference pro-

ceedings, and e-prints. Most are dated between 1999 and 2004, and a large percentage of the entries (78 percent) link to freely available resources. These URLs were last checked on August 31, 2004 (presumably right before publication).

True to the spirit of open access, this work has been licensed using a Creative Commons Attribution Non-Commercial License. Bailey has self-archived the book in a PDF format, making it freely available online.[1] An online version proves handy indeed when trying to access citations with lengthy URLs.

Bailey offers solid credentials for such a project: not only is he an expert in the study of electronic scholarly publishing, but he also has more than ten years' experience in compiling online *Scholarly Electronic Publishing Bibliography*.[2] Like all good bibliographers do, he discloses his scope for the open access bibliography in the preface by quoting the Budapest Open Access Initiative definition:

> By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. (xi)

He deliberately avoids the temptation to wander into tangential areas of electronic scholarly publishing. For example, the only references that discuss copyright that are included are those that discuss it in the context of open access.

The next section, "Key Open Access Concepts," lays the frame-

work for the rest of the book, since it enables readers to understand how topics such as developing countries relate to the open access movement. Combined with the preface and the subsequent "General Works" chapter, these sections should provide a solid background on open access to any student or interested scholar.

The subsequent chapters cover open access statements (it is particularly helpful to have the statements on open access such as the Berlin Declaration and the Bethesda Statement all in one place), copyright issues, open access journals, e-prints, disciplinary and institutional archives, and open archives harvesting. The last chapters include conventional publisher perspectives and government inquiries and legislation, as well as open access arrangements for developing countries. The book unfortunately lacks an index.

Any bibliography is a snapshot in time: ideally it has some enduring value, but it cannot help but reflect the resources of the era and the views of the author. This phenomenon is all the more true for emerging trends such as open access, in which new developments are ongoing. Inevitably, four years later, as the open-access movement surges forward, some of the material does seem dated, such as the "Government Inquiries and Legislation" chapter.

Moreover, Bailey's support for open access is obvious from the celebratory subtitle of the book, "Liberating Scholarly Literature with E-Prints and Open Access Journals." Not surprisingly, the Association of Research Libraries, a leading advocate of open access through its Scholarly Publishing and Academic Resources Coalition, published this title. To be fair, Bailey does include a three-page chapter (the shortest chapter in the book), "Conventional Publisher's Perspectives," which provides some of the arguments against open access. The debates about open access that

occurred in Web forums on Nature .com are also cited.

Compiling a bibliography in the modern digital era presents different benefits and challenges than even a little over a decade ago. Sidney Berger, a bibliographer himself, bemoaned how his work was "dependent on librarians, other scholars, on-line catalogues, telephone lines, and other intermediary agents which conspire to thwart our excellent work and threaten to expose it to the invective of unsympathetic critics who have never compiled a bibliography themselves."[3]

On the other hand, Bailey had opportunities and challenges presented by resources available on the Internet. His search encompassed a variety of sources that might yield resources, such as databases, archives, and search engines. He used a "pearl growing" (xiii) approach to find additional citations through checking references of relevant materials. In accordance with the philosophy of open access, he endeavored to provide links that gave freely available access. When online resources required paid subscriptions or even free registration, he cited the print instead, or, if not printed, left the citation out completely.

The links are both the book's strength and weakness. Freely available online resources, like the open access movement itself, promise research that is just a click away and not dependent on subscriptions or institutional affiliation. The weakness lies within the fluid nature of the Web. Bailey himself noted such a drawback, "Given the high degree of inclusion of 'grey literature' in the bibliography, the reader should expect URL decay, and to some degree, reference decay as well" (xiv). This prediction has proved true four years later. For example, many of Walt Crawford's Cite links are no longer available at the URL given (eleven of these appear on page 6) because of an apparent move to another Web site.

Such a minor quibble should not

detract from the value of this work. This title is a major contribution to the study of the open access movement in general, as well as its emergence in the early twenty-first century.—*Mary Aycock, (aycockm@missouri.edu), University of Missouri-Columbia.*

References

1. Charles W. Bailey, *Open Access Bibliography: Liberating Scholarly Literature with E-Prints and Open Access Journal* (2005), www.escholarly pub.com/oab/oab.pdf (accessed April 8, 2006).
2. Charles W. Bailey, Scholarly Electronic Publishing Bibliography, www.digital-scholarship.org/sepb/ sepb.html (accessed April 8, 2008).
3. Sidney E. Berger, *The Design of Bibliographies: Observations, References and Examples* (London: Mansell, 1991), 28.

Organizing Information from the Shelf to the Web. By G. G. and Sudatta Chowdhury. London: Facet, 2007. 230 p. $95.00 paper (ISBN 978-1-845604-578-0).

Given the range of heterogeneous information resources available today and the disparate nature of the environments in which they reside, the role of the cataloger has evolved tremendously. More than ever, catalogers are expected to be familiar both with traditional approaches to information organization and with the emerging standards of the networked environment. G. G. and Sudatta Chowdhury stress that the rapid development of the Internet, Web, and digital libraries necessitate the teaching of fundamental concepts, tools, and techniques of information organization. In their book, *Organizing Information from the Shelf to the Web*, they attempt to "cover the broad spectrum of information organization in different environments—from print libraries to the internet, intranet, and web" (xiii).

The primary audience for this text is library and information science students. Practitioners who want a basic

overview of information organization in today's networked world would also be served well. The authors' intent is to present a book that "will lead interested readers to further studies and research by pointing them to the appropriate references" (xiv). Thus they do not aim to present a thorough discussion of information organization; rather, they intend to provide a brief overview and guide. The result is a 230-page book containing thirteen chapters and a short preface, glossary, and index.

Upon reflection on the topics covered in each chapter, it is evident that the book can be divided into four distinct parts. Chapters 1 and 2 present a rudimentary look at the concepts of organization and classification, covering approaches taken in our everyday lives, the traditional approaches of libraries, and the variety of approaches in the online environment. In chapters 3–6, the authors address in more detail the approach taken by libraries to present information on cataloging, bibliographic formats, classification systems, subject-headings lists, and thesauri. Also presented in these chapters is an analysis of how libraries have adapted to the emergence of electronic collections by implementing change to traditional practices. Chapters 7–10 focus on the organization of Internet information resources, the emergence of metadata to describe and manage those resources, the syntax utilized in online environments (markup languages), and the development of semantic relationships for improved information processing (ontologies). The final chapters, 11–13, discuss the emergence of an assortment of initiatives and trends. They include the growth of information architecture as an area of study focused on the management of intranets and the Internet, discussion of the Semantic Web, and other recent technological developments.

Before I delve too deeply into the critique of this work, it is impor-

tant to mention that although the authors do not explicitly state that the book is primarily intended for a European audience, it is duly noted. Most references to online resources in the text are British; however, they are still quite relevant and interesting. The authors are diplomatic in their coverage of various formats and classification systems by providing more detail for those with broader application worldwide. This approach presents no problem for North American readers, except in chapter 5, "Library Classification." The authors present basic information about the Dewey Decimal Classification (DDC), as well as instruction for building DDC numbers. But the Library of Congress Classification (LCC) receives only a bulleted list of general features, some of which are inaccurate. For example, they claim that LCC lacks hospitality, when in fact it is a widely accepted strength of the classification system. The extent of information provided for LCC versus that of DDC is uneven, and leaves something to be desired for North American readers. Also, an issue for readers outside of the United Kingdom is the discussion of metadata standards in chapter 8. Given that the few metadata standards covered in this chapter are accepted worldwide, it seems unusual to include the e-Government Metadata Standard, a standard employed by the United Kingdom. While it is informative, it is not particularly relevant to readers abroad.

The authors provide a multitude of examples to support the subject matter. Some of them, however, are inappropriate and obscure, while other sections of the text lack much-needed examples. One can only speculate that the use of inappropriate examples is a result of the authors' experiences. For example, when describing enumerative classification systems, the authors use DDC irrespective of the fact that it is no longer considered an enumerative system, but is an analytico-

synthetic system. In this case, DDC is used in both explanations. In fact, almost all examples given in chapter 5 are DDC regardless of its relevancy to the information being presented.

A section that warrants examples is the discussion on Functional Requirements for Bibliographic Records in chapter 3, "Cataloguing." The authors present a mind-numbing explanation of two figures displaying group 1 and 2 entities and their relationships. In the span of two pages, the text repeatedly reads as such:

> A *manifestation* may be produced by more than one *person* or *corporate body*, and a *person* or *corporate body* may produce more than one *manifestation*; thus the relationship is *many-to-many*. An *item* may be owned by more than one *person* and/ or *corporate body*, and a *person* or *corporate body* may own more than one *item*; thus the relationship is *many-to-many*. (49)

The lack of a coherent example makes this "explanation" virtually meaningless.

The authors' aim to provide simple introductory information is more or less achieved; however, the depth of coverage tends to range from concise statements to in-depth presentations. Moreover, the text contains numerous cosmetic and typographical errors. While many of these errors are harmless distractions, others are glaring inaccuracies that misrepresent key content. For example, the main subjects of the Colon Classification are listed in chapter 5 with two subjects represented by the letter *G* (Geography and Biography) and two subjects represented by the letter *H* (Geology and History). Geography should actually be represented by the letter *U* and History by the letter *V*. This particular inaccuracy is mislead-

ing, as is the use of outdated LCC numbers in the same chapter.

Generally speaking, the book is accessible with the exception of chapter 12, a complex, jargon-laden discussion of the Semantic Web. Noteworthy chapters include chapters 1, 9, and 13. In chapter 1, Chowdhury and Chowdhury present one of the most accessible explanations of organization and classification as it pertains to everyday life that I have read. Chapter 9 contains a well-balanced breakdown of the differences between the varieties of markup languages. Chapter 13 serves as a basis for further discussion of emerging trends and issues. It is both relevant and timely.

Perhaps the most significant contribution that the authors have achieved in writing this book is its uniqueness in coverage. Roughly half of the book is dedicated to the organization of information on the Internet, intranets, and the Web. Discussions on metadata, markup languages, ontologies, information architecture, and related developments that pertain to the networked environment are warranted and are handled with great accomplishment. The references listed at the end each chapter effectively serve the intended purpose of providing supplementary material that will enhance the study of information organization. Despite its shortcomings, *Organizing Information from the Shelf to the Web* merits consideration because G. G. and Sudatta Chowdhury have managed to provide an essential balance between the treatment of traditional practices and that of emerging practices in today's changing environment.—*Sandy Rodriguez, (sxrodriguez@ualr.edu), University of Arkansas at Little Rock.*

International Newspaper Librarianship for the 21st Century. Ed. Hartmut Walravens. Munich: K.G. Saur, 2006. 298p. $109.00 (IFLA members $81.00) cloth (ISBN 3-598-21846-X). IFLA Publications, 118.

Newspapers of the World Online: U.S. and International Perspectives: Proceedings of Conferences in Salt Lake City and Seoul, 2006. Ed. Hartmut Walravens. Munich: K.G. Saur, 2006. 195p. $109.00 (IFLA members $81.00) cloth (ISBN 3-598-21849-4). IFLA Publications, 122.

As noted in *International Newspaper Librarianship for the 21st Century,* newspapers are "still not liked by a large number of librarians and archivists because they are labour and staff intensive, and that means cost intensive. Also they take a lot of shelf space, they need special treatment for preservation, and they should be microfilmed" (9). But fear not, for, as the reader soon learns, the current state of newspapers collections and digitalization projects is becoming increasingly popular, and they are liked by the exceptional, hardworking, and creative librarians and archivists who care about their newspaper collections immensely. But what is the current state and shape of newspaper libraries around the world? What are some digitalization projects currently under way? How do different newspaper libraries and librarians deal with the demands of working with this unique medium, changing technology, electronic storage, and not enough funding?

Two books published in 2006 are now available to answer those and many more questions. *International Newspaper Librarianship for the 21st Century and Newspapers of the World Online: U.S. and International Perspectives: Proceedings of the Conferences in Salt Lake City and Seoul, 2006* offer unique and detailed accounts of newspaper librarianship from both an American and an international perspective and try to cover these various questions. Both volumes are conference proceedings from various International Federation of Library Associations and Institutions (IFLA) conferences held in 2003, 2004, 2005, and 2006, and are edited by Hartmut Walravens. Walravens has

been the chair of the Newspapers Section of IFLA, and he has edited two other newspaper volumes of IFLA conference proceedings: *Newspapers in Central and Eastern Europe,* published in 2005, and *Newspapers in International Librarianship, published in 2003.* While there is some overlap in terms of content and authors in the two volumes under consideration here, each article offers a different approach. These two volumes also complement each other to create a well-balanced looked at the state of newspaper librarianship on a global scale.

International Newspaper Librarianship for the 21st Century presents the proceedings for the IFLA Newspapers Section annual conferences held in 2003, 2004, and 2005, and the midterm meetings for the same years. These forty-plus articles spotlight what is happening in regional newspapers, what is being accomplished in the field of preservation and digitalization, and they also cover the issue of newspapers and copyright in the European Union, the United Kingdom, and South Africa. National digitalization projects discussed in this volume include: Australia, Canada, China, Columbia, France, Namibia, South Africa, Sweden, United Kingdom, United States, and Venezuela. Articles are primarily in English, but some authors have submitted their papers in English together with a French or Spanish version. This book also includes a current list of South African newspapers with their dates of commencement. Other topics discussed in this volume in relation to the overall theme of regional newspapers, digitalization, and preservation include newspaper selection, finance, staffing, electronic newspapers, CD-ROMs, software, new technology, challenges and issues in today's newspaper librarianship, copyright and fair use, copyright clearance, digitalization standards, storage, and Optical Character Recognition (OCR).

Newspapers of the World Online notes that newspaper "digitization has been a hot topic in newspaper librarianship for some years now" (7) and that it is still a hot topic with all the different types of digitalization projects currently under way. This second and smaller of the two volumes includes twenty-plus papers from the 2006 annual conference session and midterm meeting. Digitalization projects discussed include those in Canada, Chile, Finland, France, Germany, Japan, Korea, Mexico, New Zealand, United Kingdom, and United States. All of the papers in this volume are in English, and they touch on subjects that one must think about when creating digitalization projects, including metadata, procurement, Internet delivery, microfilm, intellectual-property rights, staffing, OCR needed to make the text searchable, finance, and newspaper selection.

The style of the articles in both volumes covers a wide gamut from those with endnotes, to others with references, to those with no citation information. There are articles with photographs and other illustrations as well as some with charts and lists of various newspapers and their printing runs. The historical aspect and research into the history and evolution of newspapers around the world in what many readers will find fascinating and informative. Where else will one find lists of national presses that

have existed and continue to exist in France, Germany, and South Africa? Reading these two books, one realizes (despite the year, culture, or country) that the newspapers and their libraries are in, these librarians and archivists and their libraries are all dealing with very similar issues, such as of lack of funding, lack of shelf space, technology, personnel, preservation of the print copies of newspapers, microfiche, digital databases, copyright, etc. Unfortunately, they also have to deal with the reality of what should be digitalized and preserved and what should not or cannot be. Despite the many challenges that these authors have faced in their various newspaper collections, they all seem to have a sense of knowing that what they are doing is of great importance. These are people, libraries, and institutions on the front lines, saving history one page at a time.

While these two books do cover a lot of ground and offer a lot of information, their one fault is that they could have been edited more thoroughly. Because the articles are papers presented at conferences, grammatical errors were not corrected uniformly or at all. There are also a few cases where no conference paper was submitted, so the author's conference PowerPoint presentation was included instead. These PowerPoint papers are either formatted as a list of items, or the actual PowerPoint slides are

included. While it's wonderful that these were included, they are often hard to follow and leave much to the imagination because there is no introduction or conclusion. Another issue that impedes the reader in both books is the absence of division between the conference proceedings. The only way the readers know that they are moving on from one conference to another or from one year to the next is by looking at the table of contents. Both volumes also lack an index, so finding specific information on authors, topics, or countries will be challenging.

Majlis Bremer-Laamanen of the National Library of Finland can easily speak for all the contributors in both volumes when she writes in *Newspapers of the World Online* that "historical newspaper collections and the born digital ones are connecting the users to places, questions, nations and human life over centuries. Incidents from the past are suddenly easily accessible. The past is living in the present" (43). It is this easy connection that makes newspapers, be they in print, entirely online, in microformat, or in digitalized form so important. Despite a few faults, these two books offer a fresh understanding on the state of newspaper libraries around the world.—*Melissa Aho (aox0017@umn.edu), University of Minnesota, Minneapolis.*

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