ARTICLES

The Coming of Age
Sophia K. Jordan

The Changing Nature of Collection Management in Research Libraries
Joseph Branin, Frances Groen, and Suzanne Thorin

Metadata and Authority Control
Sherry L. Vellucci

NOTES ON OPERATIONS

The Selection Connection
Creating an Internal Web Page for Collection Development
Julie L. Rabine and Linda A. Brown

FEATURES

Book Reviews
Introduction to Managing Digital Assets
Delivering Digital Images
Images Online
Basic Book Repair Methods
Margaret Rody, Editor

Instructions for Authors

Reviewers 1999
Sponsors 1999
Index to Advertisers
This page intentionally blank
Six years have passed since the last review of preservation literature in this journal. The last five years suggest a "coming of age" for the field of preservation, which can be seen both in the emergence of preservation departments and of practices sufficiently developed to have their own history, methods, subspecialties, and philosophical schools. In this review, I organize the literature into eight categories: binding and bindings; physical treatment; reformatting; audio-video, film, and photographic materials; the digital arena; environment control; disaster planning; and management. The bibliography provides a snapshot of the relative distribution of the scholarly and research activities within the profession.

Six years have elapsed since the last review in LRTS of preservation literature (Drewes 1993; Bourke 1993). If my predecessors lamented the difficulties in selecting topics to cover or citations to include in 1993, then the task is even more daunting in 1999. There is an advantage, however, to reviewing a corpus of work over a longer period of time—the advantage of perspective. Nonetheless, charting five years of the literature has forced a certain necessity for restraint. Excluded from consideration here are book reviews, annual reports, preservation project announcements, standards, technical leaflets, and strictly technical conservation literature in serials and monographic series such as Restaurator and The American Institute for Conservation of Historic & Artistic Works. Including these would have swollen the scope to an unwieldy size. While technical articles are not included, I have made an exception for technical works when they have appeared outside the core preservation and conservation publications.

I have organized the bibliography into categories intended to help the reader navigate to specific areas of interest. The divisions are neither exhaustive nor fixed, and clearly, many titles could have been placed elsewhere. The advantage in listing the bibliography this way, however, is that it provides a snapshot of the relative distribution of the scholarly and research activities within the profession.

In the course of the last five years, the greatest change in the publication and dissemination of preservation literature has been the advent of the World Wide Web. The proliferation of information both original and representations of printed literature is extensive; yet, not all Web sites are created equal. I have limited my citations to those Web sites devoted strictly to preservation literature.
that are authoritative and have reliable Uniform Resource Locators.

**Review of the Literature**

The last five years of work in the field suggests a “coming of age” for preservation. Preservation has been a part of libraries both as an administrative unit and as a unified practice long enough now to have developed a history, a methodology, a series of sub-specialties, and, yes, even philosophical schools. Jones observed (1991, 294): “A survey of over sixty-five articles and news items in English . . . reveals that technical and managerial concerns have not changed dramatically in the recent past. This fact reflects the continuing importance of certain problems that remain unsolved and the relative youth of preservation and preservation professionals in libraries . . . and the suffering from a lack of shared understanding of its goals.” If preservation’s nature as a discipline was tenuous at the close of the 1980s, then the literature of the 1990s bears testimony to a profession that has come into its own by the sheer breadth and depth of the issues it has tackled, debated, resolved, and revisited.

Jones noted that in the literature of the previous decade, authors wrote works dedicated to developing practical repair skills or sharing managerial tales about local procedures. Such works seem appropriate to a fledgling library operation. In the literature of the early 1990s, however, authors already suggested that preservation would soon move to a new evolutionary stage.

Drewes (1993, 315) noted, “If one of the goals of preservation professionals is the integration of preservation strategies within the rest of the organization, then 1992 showed movement toward that goal . . . preservation issues are becoming more broadly recognized within other library functions.” She cited 124 works in preservation with fewer than five titles each in the areas of: preservation cataloging and access; commercial binding; audio-video preservation; mass deacidification; disaster preparedness; copyright; microfilming and reformatting; and historical works. In this survey, approximately 50 titles covered physical treatment, environmental monitoring, and selection for preservation, while 30 titles were focused on digital technologies, preservation management, international preservation, and institutional cooperation.

That same year, Bourke (1993) reviewed the 1992 reformatting literature; he cited 138 works covering a growing repertoire of reformatting activity, which included not only traditional microfilming and photoduplication, but emerging digital technologies. Bourke noted in his introduction (323), “Issues relating to the reproduction of library materials have now proliferated far beyond the traditional practices of microfilming and photocopying . . . new electronic applications long technologically possible are becoming more economically feasible and are making their own distinctive niche in the files of document publication, reproduction, and delivery.”

If the literature of the early 1990s reveals an explosion in established areas and an exploration into new frontiers, then the preservation literature covering 1993 through 1998 shows refinements in established preservation concerns and a maturation and leadership in the new frontier.

**Binding and Bindings**

While standards set by the Library Binding Institute (LBI) have settled many of the core preservation decisions surrounding commercial binding, some issues remain. Tibbits (1996) pointed out the inherent difficulties associated with binding music performance scores and noted that the LBI does not address the unique needs of these materials. Moreover, commercial binders are not able to provide the diversity of binding options on a production basis for them. As a consequence, many of the binding strategies designed to address these materials have evolved from local remedies. While many practices are not sound, Tibbits noted that there are a number of good practices, and documenting these for distribution would be helpful to those who must deal with the complex binding needs of performance scores.

Several authors have discussed the automation of commercial binding practices (Paris 1993a; Bendror 1997; Rebsamen 1995). The debate over flatback versus rounding and backing, which preoccupied commercial binders in previous years, resurfaced only briefly in the literature (Fairfield 1997). Proponents on both sides of the debate have ample evidence to suggest that binding practices remain varied and that commercial binders should continue to provide an array of options that fit form to function. Given the central role of commercial binding in preservation departments, Clareson, Wilkinson, and Bordeianu (1997) wrote about contract negotiations and working with binders, a topic that continues to merit reappearance and refinement.

The number of works on historical bindings and the history of bookbindings and bookbinders was a pleasant surprise in a decade that began with prognostications that the book as object would be eclipsed by the digital book. Allen and Gullans’s definitive volume, *Decorated Cloth in America: Publishers’ Bindings, 1840–1910* (Allen and Gullans 1994), provided a reminder to curators and preservation departments that our shelves are filled with volumes that cross the boundaries of treatment decisions for commercial binding, general collections binding repair, and conservation. Tidcombe’s *Women Bookbinders 1880–1920* (Tidcombe 1996) was the first major work to address women’s contributions to bookbinding. Foot’s *Studies in the
History of Bookbinding (Foot 1993), along with Raby and Tanindi's Turkish Bookbindings in the 15th Century (Raby and Tanindi 1993), and a reprinting of Middleton's History of English Craft Bookbinding Techniques (Middleton 1996), provide invaluable information regarding previous bookbinding practices. These works serve as critical resources for both conservators who must understand the context of the materials they treat and preservation administrators who must design responsive preservation programs.


Physical Treatment

While the most technical aspects of conservation can be found in the core conservation publications, other journals provide avenues for the literature as the science associated with the conservation of library materials is recognized. Two technical conservation articles appeared in Analytical Chemistry: Clark and Gibbs (1998) and Gibbs, Seddon, and Brovenko (1997). Brown (1994) provided a technical glossary for illuminated manuscripts, while Caiaicia and Anderson (1995) provided one on matboard and glazing. Preservationists have long recognized that conservation is both a scientific and a humanistic enterprise. The migration of preservation issues into other professional literature continued in the mid-1990s, a trend that both Drewes (1993) and Bourke (1993) noted in their reviews of the literature.

The literature of physical treatment is a healthy reminder of the significant investment of time and money associated with research. The work to develop and articulate the parameters of a mass deacidification delivery process by preservation librarians at the Library of Congress, at other libraries, and in the private sector is one such example. This process was originally thought to be the heir apparent in solving the acid book problem. Harris and Shahani (1994) explained the science and the benefits of the diethyl zinc process. Independent assessments by Porek (1996) and Brandt (1993) of other mass deacidification processes suggested that there were alternatives. Interestingly enough, since Preservation Technologies’ successful delivery of a mass deacidification process, only Grimard (1997) has written on the topic. While it is true that mass deacidification has been successfully established as one of several preventative treatment options available to libraries, much of the literature in this area has been eclipsed by the advances in digital technology. Mass deacidification provides a much needed preservation bridge between what is already acidic, but not yet brittle, and the associated costs of reformatting. One can hope that future preservation literature will include works devoted to strategies for cooperative mass deacidification programs.

While several authors wrote between 1993 and 1995 about housing options for special collections (e.g., Glaser 1994; Kulka 1995; Norris 1998; Bonadea 1997; and Tuttle 1995), only four authors examined the role of conservation or book repair programs (Chopra 1995; Silverman and Grandinette 1993; Grandinette and Silverman 1994; and Milevski 1995). This suggests either that physical treatment is well defined and established in our programs or that new technologies are eclipsing conversations about treatment.

Reformatting (Microfilming and Photoduplication)

Like commercial binding, preservation microfilming has attained a certain maturity and authority, which is often the case when there are standards that define a practice. The greatest number of works published in this area appeared between 1993 and 1995. Elkington (1994) and D’Arienzo, Ostendarp, and Silverman (1994) offered some refinements to microfilming technology and to management issues associated with activities in the archival community. Fox (1996) provided greater emphasis on the importance of bibliographic control and project administration than had been previously explored in the original edition. Fox rightly noted that bibliographic control is the linchpin for national and international preservation efforts. Indeed, there is no better testimony to the need for global accessibility to microform masters than the successful conversion of the National Register of Microform Masters into the databases of the OCLC Online Computer Library Center and the Research Library Information Network. On the other hand, works by Kesse (1993) and Jones (1993) remind us that the success of any technology is related directly to the reliability and diligence of individuals, institutions, and the profession in maintaining quality.

A number of authors wrote during this period on the topic of improving preservation photoduplication efforts. The Subcommittee on Preservation Photocopying Guidelines (1994) established guidelines for photocopying. Weber (1993) assessed the effect of photocopiers, while Baird (1997) examined implementing a national effort to identify and to share in the photoduplication of titles. Traditional reformatting technologies continue to meet the preservation and access needs of many patrons. Willis (1993) suggests that there is ample evidence that for the foreseeable future, preservation departments will rely upon
a number of technologies to preserve and to provide access to deteriorating resources.

**Audio-Video, Film, and Photographic Materials**

Preservation librarians have not been particularly adept at dealing with the preservation issues associated with nonbook formats. There are myriad nonbook formats that populate our libraries, including photographic collections, recorded sound collections, moving image collections, and CD-ROMs. From 1993 through 1995, a number of authors wrote about physical care of these items (e.g., Eilers 1995; Kiernan 1995; Lindner 1994; and McKee 1993). Others have written about the handling and storage of these materials (e.g., Forgas 1997; St Laurent 1996; Van Bogert 1995; and Wheeler 1997), as well as reformating issues (Eilers 1995; Kesse 1993; and Storm 1997). Dale et al. (1998) provided a first step in identifying the preservation literature of these formats. Boyle (1997), Cochrane (1994), Forgas (1997), Murphy (1997), and Storm (1997) discussed the need to improve management and strategic planning in this area. Several authors referred to the lack of standardization and to the fragmented nature of the preservation research being done in this area.

**The Digital Arena**

The most important change in the preservation literature of this period is the number of titles devoted to digitization. Pearson (1992) cited approximately 444 works, 300 of which were devoted to digital technology. The authors of many of these earlier works focused on what digital technology could do for libraries. These early proponents of digital technology were not bashful in proclaiming that the revolution was at our doorstep. They claimed that digital technology would have many effects, including dramatically improving and streamlining both bibliographic and physical access; saving shelf space; cutting costs associated with serials acquisitions and traditional preservation treatments; and, fundamentally transforming the library from place to space. Many of the same themes were echoed by authors cited by Bourke (1993). Both Pearson and Bourke observed, however, that the majority of these works were published outside the library profession. While many library professionals were convinced that the new technology could soon deliver what was previously imagined, preservation librarians recognized the need to determine the real, and not the "virtual" utility of the new technology. The most important change since the last review of the literature, therefore, is not the burgeoning field of digitization literature, but the wholesale absorption of digitization into preservation management.

In 1993, librarians at Cornell University commenced a project to test the feasibility of using digital image technology to preserve and improve access to deteriorating library materials by digitizing directly from the source document. Kenney (1993) and Kenney and Chapman (1995) established standards for digital preservation documents, expressed as scanning resolution quality for image and text. Cornell continues to be a leader in the digital arena for its thoughtful and methodical investigation of potential uses and practical applications in preservation and access.

Simultaneously, Conway (1996a) explored the feasibility of means, costs, and benefits of converting large-scale quantities of preservation microfilm to digital images. Conway (1996c) suggests that the potential difficulties of defining selection for digitization can be assuaged by turning to the enormous investment of existing microfilm collections.

By 1995, the place of digital imaging and optical recording technologies for preservation and access took center stage at the International Symposium in Essen Germany (Weiss 1996). Presenters at the conference pronounced that, in the new digital world, preservation is access and access is preservation. The irony of this new vision is that, while it is true that digital technology increases physical access to works, it has no inherent ability to increase intellectual access. Unlike the book format, digital formats increase the distance between the reader and the text, between the signifier and the signified. This necessarily increases human dependency on the number of technological intermediaries that must take place before data can be converted into meaningful structures. Thus the necessity for metadata and for standards.

Since 1995, organizations such as the American Research Libraries, Research Libraries Group, and the Commission on Preservation and Access (now subsumed within the Council on Library and Information Resources) have provided a number of publications based on case studies. The authors of these have demonstrated the growing partnership between scholars and librarians in an effort to explore subject-specific applications for the new technologies (e.g., Bagnall 1995; Boston 1994; Butler 1997; D'Amato and Klopfenstein 1996; Dykeman 1997; Durrant 1997; Ellis 1996; Ester 1994; Gartner 1997; Gladney, Mintzer, and Schiattarella 1997; Gertz 1996; Gonzales 1998; Hagenbruch 1994; Nugent 1997; Ostrov 1998; Scally 1997; Secor 1997; Wilhelm and Brower 1993). McClung (1996) provided a dramatic snapshot of the digital terrain during this time. She clearly illustrated that early digital projects were focused on access and not preservation.

If the road to access and the road to preservation are to meet in the digital arena, then bibliographic control, informational longevity and authentication, and the longevity of digital files must be addressed and standards articulated. Preservation librarians have led the discussion and the
systematic research needed to develop the standards for use, application, and added value. The question of developing standards is echoed by Shao (1996), who noted (224), “This new access technology is expected to seriously alter the way libraries acquire and disseminate information, but it also changes the role of preservation. Whereas before preservation was most concerned with physical permanence of information, whether original or surrogate copies, in the new digital paradigm the act of preservation also provides access in ways not previously possible.” He also stated (225), “Access, while central to the workable concept of digital preservation is an area where research and planning is ongoing, but where considerable progress has yet to be made. A chief component of the growth and acceptance of microfilm was the adoption of standards for areas of film production. No such standards are yet in place for the digitization process, although test bed projects to identify and recommend standards for digitization processes are in place and are being discussed.”

Graham (1995, 335) clarified for the reader, “Refreshing is agreed to be necessary for long term preservation across advances in computing technology, media, and software. And that authentication and integrity is the provision for ‘intellectual preservation’ which ensures the ‘protection of the intellectual structure of the information as it was recorded by its author.’” Commitment to standards and compliance is needed first, before any institution can claim to have succeeded in digital preservation. Graham noted (335), “Nothing makes clearer that a library is an organization, rather than a building or a collection, than the requirement for institutional commitment if electronic information is to have more than a fleeting existence.” The National Digital Library Federation is an example of just such an effort that is committed not only to exploring the standards for conversion, but also to the inherent issues associated with archiving.

A number of authors have addressed the life of digital files (Howell 1996; Casey 1998; Graham 1993; Hedstrom 1997a; Lesk 1996; Mohlhenrich 1993; Scally 1997; Saunders 1997; Waters 1996; Van Bogart 1994; and Weber and Dörn 1997). Waters and Garrett (1996) are optimistic that migration strategies will take care of the long term issue. From the perspective of preservation librarians, however, digitization is still not preservation, no matter how much we may want it to be or how much the literature uses the terms equivocally. Marcum (1996b) noted that while digital libraries and digital archives both collect and provide access to digital information, only digital archives claim responsibility for storing and ensuring the long-term accessibility to that information.

Gertz (1996), Kenney (1993), and Conway (1996c) added that digitization without selection, bibliographic control, standards, and commitment to longevity neither constitutes building a digital research collection nor does it constitute preserving it. For each of these authors, bibliographic control is more critical, not less, in a digital environment. Conway stated (1996c, 70), “Now, as we move toward the creation of a full-scale digital library created from a wide variety of source documents, some critics of traditional cataloging practice are beginning to suggest that we downplay full cataloging of electronic resources precisely at the point at which the MARC record is beginning to fulfill its potential as a universal data exchange format. This would be a mistake . . . without improvements in intellectual access to microfilm collections that support subject oriented retrieval, digital conversion of these collections may prove to be quite feasible technically and quite untenable intellectually.”

**Environment Control**

For some time now, preservation professionals have asserted the critical role that maintaining a controlled environment has in preserving collections. Lull (1995) and Wilson (1995) each provided further refinements to environmental guidelines or standards, Sebera (1994) and Beilby, Nishimura, and Zinn (1995) provided qualitative tools for assessing the damaging effect that the environment can have on collections. These tools offer practical assistance to both the professional and the layperson in understanding the concept and the mechanics of useful life in the context of environmental factors.

Several works addressing insect and pest infestation (Child and Pinniger 1994; and Harmon 1993) and preventing and treating microbiological infestation (Kaplan 1998) also appeared during this period.

**Disaster Planning**

Eighteen monographs on disaster planning were published during this five-year period. The works spanned special libraries, archives, and records management organizations. Some might argue that the number of works resulted from that peculiar psychological quality that no one ever “feels” adequately prepared or from the fact that the 1990s witnessed more than its share of library disasters. It is more likely the case, however, that we recognize that regularly scheduled reviews of disaster plans and its attendant manuals are at the heart of successful disaster recovery. As a result, disaster planning has something of a perennial existence within the literature.

**Management**

Under the rubric of management is an array of scholarly research that reflects the breadth and the depth of the issues
that have engaged preservation managers and the profession. This category includes works dealing with the management of materials, human resources, collection assessment, selection for preservation, preservation education and awareness, outreach, collaborative programs, and international preservation.

There were a number of works devoted to collection assessment, both nationally and internationally. At home, Ames (1997), Baird, Krentz, and Schaffner (1997), Braun and Hopkins (1995), and Gertz and Blaine (1994) assessed the deteriorating state of specific subject collections, while O’Neill and Boomgaard (1995) assessed the state of book deterioration and loss magnitude in the Ohio libraries. Smith and Oliszak (1997) described the full range of strategies that have been employed in our libraries to cope with mutilated art books, everything from ignoring them to repairing or replacing them to restricting access to them. Bloom and Stern (1994) suggest that electronic resources might help in this regard. Indeed, Schumm (1994) noted that the demand for mutilated periodical articles has decreased over time and, as a result, mutilated items might not be a high priority in a used-based preservation selection program. These authors and others continue to offer methods and strategies to preservation librarians that can assist in informing our decisions regarding selection and prioritization.

We continue to live with the legacy of acidic and brittle books. Gertz et al. (1993) addressed some of the issues that must be worked through in a comprehensive preservation program. The authors also remind us, however, that the fundamental question remains the same (228): “What are the preservation obligations with respect to maintaining the library’s known subject strengths?” Even in the digital arena, the question of selection remains central to the preservation mission.

Wright, Demas, and Cybulski (1993) described the program for preserving core titles of national interest in agricultural and rural life in New York state. These authors argue that partnership with subject librarians and scholars remains the most meaningful alliance. Demas (1997) rightly observed that preservation activities across the disciplines tend to be driven more by the availability of national funding than by a coherent approach to the needs and priorities of the disciplines themselves.

DeStefano (1995) expressed concern that this same principle is leading the selection criteria for digitization and argues that a use-based model is as valid and as worthy a selection criterion as the subject approach. DeStefano (411) wondered whether “sole reliance upon ‘strong’ collections produce the kind of preserved national collection that properly records intellectual diversity and important scholarship. Or does it just passively repeat existing patterns of collecting in an attempt to save time?” What stands out in the works on selection is not antithesis, but a recognition that not one approach, but several approaches might be necessary to fulfill the preservation mission.

In the course of preserving the core agricultural literature, librarians at Cornell conducted a pilot project to develop procedures for determining copyright status for monographs. Demas and Brogdon (1997) were the first to provide a prescription for preservation librarians as they begin to confront the copyright issue.

In light of the digital revolution, database design for preservation project management might seem insignificant, but Hayman (1997) rightly noted that database design is critical. The ability to exploit computer technology to conduct preservation condition surveys, track commercial binding or reformatting and treatment queues, is still underdeveloped. None of these functions are easily extracted from our general online catalogs, and while it is true that the USMARC field 583 was designed to provide such information, its reduction in projected scope has meant that preservation assessment and analysis is still a matter of customizing local databases. Hayman traced the various online applications that have been customized to provide these functionalities.

International preservation efforts seemed to mirror many of the same concerns and activities that occupied librarians in the United States. Feather, Matthews, and Eden (1996) and Hazen (1994) assessed the state of preservation programs and developments in the United Kingdom. They show that while some progress has been made, it is inconsistent and laborious.

In Africa, Alegbeleye (1996) studied book deterioration at the University of Ibadan Library. The assessments of Kemoni (1996) and Kufa (1997; 1998) of the collections at the Kenyan National Archives and Archives of Botswana, respectively, stand in striking relief with our own efforts. Similarly, Kislovskaya (1996) explained the preservation challenges that Russian librarians face amid a changing political climate. Recognizing that the preservation effort must be a global effort, several American librarians, Hazen (1994; 1995), Henchy (1998), and Dean (1997), have become strong advocates for taking a more proactive approach in addressing deteriorating foreign collections housed in U.S. libraries. As usual, the European Commission on Preservation and Access took a leadership role and convened an international conference to discuss comparative strategies for access to the world's intellectual heritage (Choosing to Preserve 1997). Meanwhile, volume 47 of Libri was devoted to international preservation.

Williams and Lunde (1997, 73-74) stated that by "the 1980s, collection development was a well articulated discipline with a core body of literature as characterized by bibliographies, prominent authorities, and an extensive body of research... In contrast, the literature of preservation, while certainly not scarce developed more slowly. Although some
may argue that preservation has not yet developed an equivalent intellectual and theoretical structure, standard preservation works have been published.” They added (82), “By the early 1990s, preservation had effectively divided into two tracks: cooperative projects devoted to mass reformatting of subject-based collections and funded by private or federal grants and locally organized and funded initiatives focused on the traditional preservation operations of binding, repair, and conservation.” If these are true characterizations of the literature of the past decade, then it is true that in the years since then authors in the preservation literature have explored an expanse of ideas, methods, and possibilities that has reached further than merely describing local practices. Indeed, preservation librarians have reflected upon themselves and have developed an historical perspective of themselves. This is nowhere more evident than in the several works devoted to historical retrospectives of the profession (Shoaf 1996; Huggenbotham 1995). It is for these reasons that we can claim that the preservation literature from 1993 through 1998 reflects a profession that has truly come of age.

References

**Review of the Literature**


**Binding and Bindings**


**Physical Treatment**


Framing Research Project Committee. Sun Rafael, Calif.: ACTS Institute.

Reformatting (Microfilming and Photoduplication)

Audio-Video, Film, and Photographic Materials

Research techniques in photographic conservation: Proceedings of the conference held at the National
The Digital Arena


**Environment Control**


**Disaster Planning**


Management


Choosing to preserve: Towards a comparative strategy for long-term access to the intellectual heritage. Papers of the international conference organised by the European


**Web Sites**

Amigos
www.amigos.org

Berkeley Digital Library
http://sunsite.berkeley.edu/Preservation

Commission on Preservation and Access
www.clir.org/cpa

Conservation Online
http://palimpsest.stanford.edu

Council on Library and Information Resources
www.clir.org

IFLA Section on Preservation and Conservation
www.ifla.org

Library of Congress
http://lcweb.loc.gov/preserv

National Archives and Records Administration
www.nara.gov

National Center for Preservation Technology and Training
www.ncptt.nps.gov

National Information Standards Organization
www.niso.org

National Institute of Standards and Technology
www.nist.gov

Northeast Document Conservation Center
www.nedcc.org

OCLC Online Computer Library Center
www.oclc.org

Research Libraries Group PRESERV
www.rlg.org/preserv

Society of American Archivists
www.archivists.org

Solnet
www.solnet.net
This page intentionally blank
The Changing Nature of Collection Management in Research Libraries

Joseph Branin, Frances Groen, and Suzanne Thorin

The contemporary history of collection management in North American research libraries began midcentury. Since then, several issues have influenced the evolution of collection management with new forces emerging in the 1990s. In this article, we point to the challenges librarians face in managing the transition into a new and uncharted environment, including differing needs and scholarly communication patterns. We anticipate digital information will bring fundamental changes to scholarly communication and thus to collection management and point to a shift from a decentralized system of duplicate print collections to one of fewer central repositories. We believe print collections are not likely to disappear but the importance of secure storage for digital materials cannot be overemphasized. In the digital age, the “library model” for funding and sharing information will be scrutinized for its applicability in a world of access. Collection management librarians must take the lead in wedding print collection management to new storage and electronic access and delivery options to maintain and preserve the record of knowledge.

Historical Background

The contemporary history of collection management in research libraries in North America began in the middle of the twentieth century as the United States and Canada emerged from World War II. Over a period of about 35 years, from roughly 1950 through the mid-1980s, collection management in research libraries in America became codified and professionalized. Three important issues greatly influenced the evolution of collection management during this formative period: (1) the rapid expansion of higher education, scholarship, and library collections; (2) the shift from collection development to collection management; and (3) attempts to collect cooperatively as duplicate collections grew.

Rapid Growth in Size and Scope of Research Library Collections

Information overload may be the greatest challenge that scholars and librarians have faced in the twentieth century. In 1870, 540 papers were published in mathematics; by the middle of the 1990s, 50,000 new mathematics articles were being published annually (Odlyzko 1995). The second half of the twentieth century has been a time of spectacular growth in all fields of knowledge, especially in scientific disciplines. According to Cummings et al. (1992, 61), book production in the United States began an “extraordinary expansion” in 1945 that was “particularly rapid during the first half of the 1960’s.” The creation of new science journals, as reported by *Science Citation Index* source publications, dramatically increased in
the four decades from 1950 to 1990, with the 1970s being the decade of the most dramatic scientific journal growth (Cummings et al. 1992).

Librarians whose careers spanned the pre- and post-1950s worlds noted a marked expansion in the scope of scholarship in America. Before World War II, academic research in America concentrated on Western culture and classical areas of science. After the war, American research horizons expanded to cover all areas of the world as well as applied and specialized fields of science (Holley 1987). Library collections grew rapidly to house the products of this expanded research effort. In the 1950s and 1960s many university librarians found themselves in the midst of a "golden age" of collection development when acquisitions funds seemed plentiful, U.S. currency was strong, and there was still room in academic library book stacks.

From Development to Management of Library Collections

Osburn (1979) documented the rapid growth of higher education and the reshaping of the academic research agenda in a post-Sputnik era. He stated that the patterns of scholarship in America were undergoing profound changes in the second half of the twentieth century, and research librarians needed to understand better and be more responsive to this new academic agenda. Among other changes, the emerging dominance of the sciences in the university's hierarchy of disciplines, the demands of government funding agencies for "relevant" research, and the decline in foreign language competencies made the older humanities-based model of collection development in research libraries less effective. Osburn concluded that a more service-oriented model of collection development, one that emphasized currency, responsiveness, and focused attention to user needs, was needed.

Kent et al. (1979) reported one of the most comprehensive and controversial collection use studies in the literature of librarianship. They described how the library collection at the University of Pittsburgh was used (or not used) over a seven-year period. Kent and his research team found (10) "that any given book purchased had only slightly better than one chance in two of ever being borrowed." As books on the shelves aged and did not circulate, their likelihood of ever circulating diminished to as low as 1 chance in 50. The team also found that journal use, in general, to be low. Kent et al., like Osburn and others, used these findings to argue for better "collection management" and for more effective cooperative collection development and resource sharing among libraries.

Codification of Collection Management as a Profession

In the late 1970s and throughout the 1980s, the American Library Association's Resources and Technical Services Division (which was renamed the Association for Library Collections and Technical Services [ALCTS] in 1986) issued a series of "Guidelines for Collection Development" (Perkins 1979) and held regional institutes on collection management and development. These guidelines and institutes helped to codify and professionalize this emerging field of librarianship. When Paul Mosher, then the head of collection development at Stanford University and one of the leaders in this new field, gave the keynote address at the first Collection Management and Development Institute (Mosher 1981), he set the theme for all the subsequent Collection Management and Development institutes. He challenged librarians to move away from a traditional "collection development" perspective, which emphasized only acquisitions, selection, and collection building, toward a new vision of "collection management," which encompassed a much broader range of policy, planning, analysis, and cooperative activities (Branin 1993). Thanks to the efforts of Mosher and other librarians who prepared these guidelines and regional institutes, "collection management" came to be a recognized functional field of librarianship by the mid-1980s. This field includes the theory and practice of collection policy development, materials budget allocation, selection, collection analysis, collection use and user studies, training and organization of collection development staff, preservation, and cooperative collection development.

Attempts at Cooperative Collection Development

Cooperative collection development, which in some sense is the ultimate activity of this new functional field of librarianship, has proved difficult to implement and to sustain. It is clear, both in theory and practice, that no single library can collect the entire record of knowledge; and, as use studies show, no library really needs to do so to satisfy most user needs. A reasonable approach might be to coordinate collection development locally, regionally, nationally, and internationally to maximize local use of library collections and broad coverage of all fields of knowledge. But, a number of national attempts to collect cooperatively have failed, and these include the Farmington Plan of the 1950s and 1960s, the National Periodicals Center of the 1970s, and the Research Libraries Group's Conspectus project of the 1980s (Holley 1987; Biggs 1955; Mosher 1986).

The Center for Research Libraries, however, emerged as a viable model for depositing and sharing highly specialized research material. Some carefully focused regional efforts, such as the one involving the academic libraries in North Carolina's Research Triangle, did provide some long-standing cooperative collection development opportunities for the libraries involved (Dominguez and Swindler 1993). By and large, however, most cooperative collection development experiments from the 1950s through the mid-1980s
were not successful. The strong political pull of local library autonomy, combined with the technical difficulty of moving print material quickly and economically over geographic distances, tended to make cooperative collection development difficult and impractical (Branin 1991).

Emergence of New Forces Shaping Collection Management, 1985–2000

Economic Constraints

In the mid-1980s many universities and research libraries found themselves in a period of fiscal constraint and even decline. Association of Research Libraries (ARL) statistics indicate that the average research library's share of a university's education and general expenditures began decreasing each year after 1983, from 3.92% in 1983 to 3.26% in 1995 (Library Expenditures 1996). Tighter budgets and skyrocketing serials costs affected the buying power for library acquisitions, forcing research libraries to buy fewer and fewer monographs (particularly internationally published monographs) and serials each year. Between 1986 and 1996, ARL member institutions reduced their annual monograph purchases by 21% and their serial purchases by 7% (ARL 1997). Chrastowski and Schmidt (1996) found that over a five-year period, from 1988 to 1992, five Midwestern research libraries (Illinois, Iowa, Michigan State, Ohio State, and Wisconsin) canceled a total of 13,021 serials titles from their subscription lists. It is possible that this rate of serials cancellation resembled the rate in the rest of the country.

Economic constraints affected all aspects of research library operations. In fact, personnel reductions seem to have been steeper than acquisitions declines. Between 1982 and 1991, the typical portion of a total research library budget spent on acquisitions remained constant at 35%, while the portion of a total library budget spent on salaries declined from 56% to 52% (Cummins et al. 1992). Staff downsizing and personnel reorganizations in research libraries have surely affected collection management programs. Anecdotal evidence points to fewer full-time heads of collection development, bibliographers, and subject specialists in research libraries as the twentieth century closes.

Hove (1993) described the emerging situation as the "decentering of the library" within institutions of higher education. According to Hove, a history professor and interim director of libraries at the University of Minnesota, the library might still have been the symbolic heart of the university, but for several reasons it was losing its central place as a funding priority on many campuses. First, new information technology was creating alternative paths for access to scholarly information, and investments in technical infrastructure and computing centers diverted funding from the traditional library. Second, the decline in arts and sciences and the rise of science and technology programs in universities eroded the power of disciplines that most directly supported the traditional library. Third, the profession of librarianship itself seemed to be in disarray, fraught with uncertainty and anxiety over its future in the computer age. Fourth, libraries were not competitive enough in the new, aggressive environment of higher education. Hove emphasizes that new leadership was required to assert that libraries still played a central role in supporting teaching and research. The library could no longer take for granted a special status in the university.

Digital Information Systems

While confronting adverse economic conditions in the 1980s and 1990s, collection management librarians faced an even more powerful force for change: the emergence of digital information systems. The online catalog was followed by electronic reference databases, and by the mid-1990s full-text digital articles and journals and digital collections vied for collection management librarians' attention. Librarians now had to balance the demands of print and digital materials, even as they sought to understand the nature and consequences of digital, networked information and the impact a new information system would have on library operations, including the budget. At the same time, scholarly publishing also experienced dramatic change. With fewer orders from libraries, university presses had to cut back the number of monographic titles they published, while commercial journal publishers, at least some of the largest science and technology publishers, expanded and flourished. All concerned struggled with the impact of the Internet; it was unclear whether this new avenue for networked communications would bring freedom or more restrictions to the collection and dissemination of knowledge.

Because of these changing conditions, the new field of collection management, begun exuberantly in the 1950s, had little opportunity to mature and form a solid base of practice or tradition. Current budget conditions in research libraries and developments in information technology and in publishing have quickly led to modifications or even reversals of recently established ideas about how best to operate collection management programs. A constricted library economy, the emergence of information in digital format, and the commercialization and consolidation of the publishing sector have combined to produce profound and surprising changes in collection management in research libraries at the beginning of the twenty-first century.

Managing the Transition

Expectations and Needs of Different Users

Collection management librarians face a new and uncharted environment. Libraries have much less buying power than
they had a decade ago. With fewer full-time staff in collection management, many selectors and bibliographers work at collection management part time while handling a much broader range of disciplines and formats. The technical advances in digitization are truly revolutionizing the way scholarly information is published, organized, and maintained, and both the scope and extent of this change are difficult to comprehend and manage. Unanswered are the questions of how radically collection management will change in the next five or ten years, and of how it is changing on a day-to-day basis right now.

As difficult as it was to manage a print collection, librarians now have two equally formidable formats to consider: print and digital. The introduction of digital resources in research libraries led to a good deal of conflict between the old and new formats. What might be called the cultural wars between print and electronic proponents began with the demise of the card catalog and moved to the fear of digital content taking over print. For a taste of these print versus digital skirmishes in libraries, one can consult Baker’s pieces in *The New Yorker* on the demise of the card catalog (1994; 1995; 1996) and Golden (1997) on the controversy surrounding the weeding of print collections when the San Francisco Public Library moved into its new building. These overt battles might now have eased or even ceased in most libraries as both librarians and users have become more accustomed to digital information systems, but serious tensions still exist over priorities, allocations, and the desires of different constituencies of library users.

**Different Communication Traditions in Scholarly Disciplines**

In fact, current practices and traditions in scholarly communication are at the base of the conflicts within collection management. The divergence among disciplines—and even within disciplines in the sciences (Kling and McKim 1998)—is noteworthy. Scholars in the sciences publish their research results in journals, rather than in monographs, in part to be able to report as rapidly as possible. They are, for the most part, comfortable with digital access to journal articles and, in many cases, communicate widely and share initial results of their research electronically, e.g., through the use of electronic preprints. In some disciplines, such as mathematics, scholars regularly use back issues of journals in their fields; in others, such as computer science, they do not. In some areas of the humanities, however, such as history, monographs, not journal articles, are required for tenure and promotion. Rapid dissemination of results is less important in the humanities than in the sciences (hence the different editing practices); and older publications are consulted more frequently than in many scientific disciplines. There are some areas of the humanities, such as philosophy, however, where monographs play a much smaller role than do journal articles.

Yet another field of study, law, is radically different from both the humanities and the sciences. Articles are generally not peer-reviewed but are reviewed by the law school students who usually edit these journals. The journals are inexpensive and largely subsidized by the universities that publish them. Commercial journals are not the most prestigious; rather the prestige of a law journal generally comes from the ranking of the law school that publishes it.

Cronin (1999, A25) commented on the differences among academic disciplines within the changing world of electronic publishing. He stated: “Interestingly, cross-field variations are largely independent of the highly visible tools and technologies associated with electronic publishing. Common platforms don’t breed common approaches. Rather, publishing practices and expectations within a given research community are shaped by prevailing norms and conventions. Nothing new in that. Traditionally, a refereed conference paper has counted for something in computer science, but is likely to be given short shrift by a promotion and tenure committee in a business school. A monograph (preferably one published by a reputable university press) will be expected of a junior scholar in English, but not of an aspiring mathematician. This being so, our *ex cathedra* pronouncements about publishing really should be grounded in the multiple realities of tribal life in academe.”

**Limitations in Library Staff and Budget Adaptability**

Within this complicated picture of needs and traditions, rapidly increasing prices of science journals have literally eaten up limited collection budgets. In fact, despite cancellation of hundreds of thousands of dollars worth of journals since 1986, the 110 largest research libraries in the United States and Canada have spent 124% more on serials to purchase 7% fewer titles, according to ARL (ARL 1998). Although monographs increase in price at a slower rate than journals, fewer monographs are purchased by libraries because of the need to fund expensive journals (both electronic and print) in the sciences. With fewer orders from libraries, scholarly presses have reduced the number of titles and the quantity of print runs; therefore, it becomes more and more difficult for a scholar to find a publisher for a monograph.

To complicate the picture further, universities and libraries have had to scramble to develop the technical infrastructure and staff expertise necessary to participate fully in the new digital information realm. Some departments in the academy still lack up-to-date computer equipment and support, while others have long had a strong information technology infrastructure and continue to improve it. The organization of libraries and the education of many library staff were designed for work in a print information system.
is not easy to change operational procedures, organizational structures, and established work habits and outlooks; such social changes generally lag behind technological change.

The amount of digital information is growing faster than most librarians would have predicted. According to Negroponte (1996), the World Wide Web doubled in size every 50 days in 1996, with a homepage added every four seconds. Despite this phenomenal growth, research libraries, for reasons stated above, are still largely dominated by print resources, both in acquisitions and collection management. It is unlikely that more than 10% to 15% of a research library's collection budget is used today to purchase or provide access to digital information. It is clear that research librarians need to turn more of their attention, effort, and resources to managing the new digital information system. It is unclear how the World Wide Web, with its phenomenal growth, can be made useful for students and scholars. Also, we have not defined who will select, catalog, and maintain worthwhile Web sites.

The OCLC Online Computer Library Center is attempting through its Cooperative Online Resource Catalog (CORC) project to provide an automated means of cataloging or otherwise describing Internet resources, including e-journals, articles, or other resources. CORC's underlying software captures the resource description and puts it into a template where it can be edited and then saved as a Dublin Core document or a machine readable cataloging record and exported into a local catalog. CORC can suggest subject headings, Dewey call numbers, and eventually will have an authority component. With CORC users can assemble "portal pages" or "pathfinders," which essentially are Web compilations of individually described resources and can be incorporated into bibliographies (Kaplan 1999).

**Understanding the Nature and Consequences of Digital Information**

**Digital Format Items as Additions to Collections**

The fundamental structure of how scholarly information is published has yet to be altered in any significant way. Authors still submit manuscripts, now more often than not in electronic form, to publishers. Publishers take ownership of the manuscripts, turn them into both print and electronic books and articles, and sell them to individuals and libraries (To Publish and Perish 1998). Research librarians and faculty members are loath to give up their print collections and journal subscriptions until digital products are more stable and mature and are able to be archived successfully. In fact, many publishers still require that libraries purchase a print version along with their electronic product.

Sewell, a collection development expert at Rutgers University, recently described the current electronic environment as one where myriad different interfaces exist; search engines crash; local loading, remote access, and operating systems have regular and recurring problems; radically different terms and conditions are found in licensing agreements; and wide fluctuations in the pricing of similar electronic products are found. He believes, however, that most research libraries have become extraordinarily adaptive in this chaotic and formative period (Sewell 1999). At this point, the digital information system is simply too immature for it to become a trusted and reliable medium for the collection and preservation of the record of scholarship. Yet librarians often hear from students and young scholars, “If it’s not on the Web, it doesn’t exist.”

**Change in the Scholarly Communications System**

Despite its imperfections, the digital information system has and will continue to have a profound effect on scholarly communication. In the 1990s, several authors wrote of the magnitude and significance of fundamental changes in scholarly communication as well as the great potential offered to the community of research and scholarship by developments in information technology (Cummins, et al. 1992; Changing World 1996; Technology and Scholarly Communication 1999). Fundamental changes in scholarly communications are certainly in store. The traditional book and journal as organizing frames for scholarship will likely change as will basic production, distribution, and archiving. Ginsparg, a physicist at the Los Alamos National Laboratory, Odlyzko, a mathematician at AT&T Bell Laboratories, and Atkinson, a research librarian at Cornell University, all have written provocatively about the demise of the traditional scholarly communication system and what its replacement might be. Taking full advantage of desktop publishing capabilities, networking, and powerful computer servers, Ginsparg (1996) envisions the development of an electronic “global raw research archive” managed by a consortium of professional societies and research libraries. Odlyzko (1995) believes the new digital information system will allow scholars to become their own publishers and archivists. According to Odlyzko (49), “Publishers and librarians have been the middlemen between the scholars as producers of information and the scholars as consumers, and are likely to be largely squeezed out of this business.” Atkinson (1998) predicts the design of new, networked-based, hypertext, document structures that may “represent fundamental revisions in the every modality of communications” and that “may affect and alter some of our basic assumptions about the nature of information itself.”

Alternatives to the three-hundred-year old model of scientific communication are emerging. In recent years, none has been quite as all encompassing as the one proposed by Varnum, Director of the National Institutes of
Health (Varmus 1999). This initiative, PubMedCentral (formerly E-BioMed), would provide an online archive of scholarly papers in the life sciences. As have previous “revolutionary” proposals, this one has already caused considerable debate (e.g., Kieman 1999; Bloom 1999; Relman 1999; Wadman 1999). When fully operational, the PubMedCentral site would make the research literature in biomedicine, plant, and agricultural science widely available over the Internet. There are numerous benefits envisioned by this proposal: open access to scientific studies and reports, larger data sets than are available in print, and more rapid dissemination of the results of research, as well as a possible reduction in cost. The program seeks to enhance the availability of papers that would have been peer reviewed and of preprints that would have been vetted by a gatekeeper.

Varmus foresees a continuing role for scholarly societies in determining what papers would be archived. Publishers, however, fear that subscriptions would be cancelled as a result of the free availability of papers on PubMedCentral, and some have not signed on to the initiative. And, within the scientific community, debate rages regarding the critical evaluation of research results in this environment. Members of the Association of Research Libraries (ARL), the Association of Academic Health Sciences Library Directors, and the Canadian Association of Research Libraries have endorsed the Varmus initiative.

**New Boundaries and New Structures for Collection Management**

*The Integration of Digital Resources and the Impact on What a Librarian Does*

The nature and structure of scholarly archives need to be changed to manage better the growing quantity, specialization, and cost of scholarship. Rather than a highly decentralized system as exists today, with duplicative print collections spread across the country, digital technologies have the potential to provide more centrally organized information storage and highly distributed, quick, and cost-effective access. Batin and Hawkins (1998, 7) stated very clearly:

> It has become clear in the past decade that traditional notions of libraries and information technology organizations are no longer intellectually and economically sustainable. Digitally produced volumes of paper publications rendered obsolete the concept of self-sufficient site-dependent collections. College and university libraries can no longer meet the information needs of their faculty and students through the traditional avenue of simply adding to their collections.

Digital technology can also foster the integration of the various components and sources of scholarly publication. In the future, researchers will no doubt use hyperlinks to move quickly online from index or bibliographic citations to abstracts to full multimedia documents with the click of a mouse. Such integration is already happening on the Web and through the efforts of library and scientific information services. The ability to use hyperlinks to integrate scholarship and to make possible interdisciplinary research online is an extraordinary feature, one with which a print format cannot compete.

Research librarians are just beginning to make broad, organizational changes in their management of the products of scholarship. Librarians are starting to provide more access to digital information not from files stored in their own libraries or on their own campuses, but from servers that are networked with publishers, government agencies, universities, and scholarly societies that can be located anywhere around the world. Rather than selecting scholarly resources on an item-by-item basis, librarians are turning into “aggregators” who are developing their collections at a macro and integrated level.

Griffiths (1998) stated that librarians will continue to need to know their users and their needs, but in an electronic environment, librarians will increasingly be subject specialists ferreting out the accurate and useful information on the Web. Collection builders will evolve into knowledge prospectors. She added (237): “The creation of validated collections of digital materials and their relationship to validated nondigital materials will offer a significant added value to the serious information seeker, while allowing other linkages to be developed and used.”

**Aggregation and New Boundaries for Collections**

Reference tools, electronic journals, and digital archives of historical materials now come in a variety of bundled packages. Johns Hopkins University Press, Elsevier, Academic Press, and the American Chemical Society all market their entire line of electronic journals as a complete package to individual libraries, local library consortia, and even to statewide or regional groups of libraries. Libraries are beginning to aggregate themselves by creating “virtual libraries” at the state or regional level to pool resources and services. The Ohio Library and Information Network (OhioLink at www.ohiolink.edu), Georgia Library Learning Online (Galileo at http://galileo.galib.uga.edu/Homepage.cgi), and the Midwest Committee on Institutional Cooperation (CIC) Virtual Library (http://utx2.csso.uiuc.edu/cic/third_level/library_vel.html) are just three examples of new virtual library consortia that are emerging across the country.

A strategy that counters the bundling of publications that most publishers use has emerged. California State University's
Managing Print Collections in the Digital Age
Managing Storage of Print Collections

The new is also affecting the old. Research librarians, running out of stack space in prime campus real estate for their library's collections and seeing new access opportunities through improvements in document delivery services, are beginning to consolidate their print materials both on and off campus. Regional storage facilities are in operation or under construction both in the United States and Canada. Scholars accustomed to browsing complete open-stack main library collections or separate discipline-based library collections in their school or department buildings find it disconcerting to see this convenient approach to library collection organization coming to an end. The high cost of maintaining decentralized archives, however, combined with the development of new digital approaches to access are making the complete main library and the traditional departmental library a convenience of the past. Direct delivery of articles to the individual’s computer and electronic browsing of titles and tables of contents might help to make up for traditional shelf browsing.

Non-Digital Materials in the Library of the Future

Still, in any large research library there are a variety of print collections that will continue to require access and preservation in traditional ways. Music libraries offer a good example of how the traditional and new formats are used regularly. Any music library of strength will contain (in addition to books on music) musical scores and parts, from which performers play—and probably will continue to play into the foreseeable future. Even as students and professors use printed scores and parts to study and perform, they also use computers to compose, analyze, and listen to music. Similar scenarios exist in other kinds of departmental and special libraries, where users require a variety of media for their research, including film, slides, photographs, maps, rare books, manuscripts, and artifacts of all kinds.

Print collections, of course, are not likely to disappear from research libraries in the near or far future. The sheer amount of information in printed form from the past would be difficult to discard or to reformat (Mosher 1966). In current acquisitions, as well, print material still far exceeds digital material in any research library's collection development program. Proper storage and preservation of print collections will continue to be a challenge for research librarians. Off-site and consortial storage arrangements and digital reformatting will provide new tools and options for managing this challenge. The JSTOR project (www.jstor.org) is an excellent model for how new technology and cooperative support can be used to provide new options for access to and storage of scholarly journal backfiles.

Digital reformatting and archiving are still problematic, however. From the Council on Library and Information Resources, Smith (1999, iv) states: “What we have found is that digitization often raises expectations of benefits, cost reductions, and efficiencies that can be illusory, and, if not viewed realistically have the potential to put at risk the collections and services libraries have provided for decades.” To date the digital information system has provided wonderful opportunities to expand access to information, but equal progress in the long-term storage and preservation of information has not yet occurred. The importance to the research community of providing secure storage for digital materials cannot be overemphasized.

New Economics of Information Acquisition
Does the “Library Model” Make Sense in the Digital Age?

Ownership issues and their effect on the control and cost of information in the digital environment are serious concerns
for research librarians. Libraries are usually thought of as places, collections, and services. Underlying this construct, however, is an economic model for funding and sharing information that is often taken for granted. In the print world, libraries buy books and journals that can be borrowed any number of times or that can be copied within the limits of copyright law and fair use guidelines. This traditional library model for the central funding and communal sharing of information may or may not work in the new digital environment. Will information move more toward a pay-per-use model, with vendors going directly to users online? Or, will the communal, library model expand and grow stronger with the rise of regional and statewide library consortia that exact cost discounts from vendors because of the economies of scale in larger contracts? Will information be free but paid for through advertising, or will it become a carefully guarded commodity that requires "cybercash" for access?

Ownership and Control of Information in the Digital Information System

Both access to and control over information take on powerful new dimensions in the digital age. The development of firewalls, encryption techniques, authentication devices, and cybercash has made the Internet a much more secure environment today for commerce and publishing. In fact, controls on the use of information can be much more powerful in the digital world than they were in the print world. Tighter control over access to information along with the commercialization of scientific publishing that has resulted in higher subscription prices has, some believe, begun to disrupt the free flow of scholarship. This situation may only be exacerbated as publishers exert more ownership over their digital products in the twenty-first century. If, however, authors, publishers, and librarians can bring the products of scholarship back into the "circle of the academy," the promise of better and less expensive access to knowledge in the digital age might be assured. The Scholarly Publishing and Academic Resources Coalition (SPARC), sponsored by the Association of Research Libraries, is a promising attempt to bring about such changes in scholarly publishing (www.arl.org/sparc/index.html).

Conclusion

The new procedures that made sense for managing collections only thirty years ago have been turned topsy-turvy by changes in higher education and publishing, by the emergence of the new digital information system, and by a weak library economy. In 1993, ALCTS held an Advanced Collection Management and Development Institute that focused on collection management issues in an electronic era. Several of the collection management practitioners who spoke at that institute expressed concern about the future of the field. Atkinson (as quoted in Brin 1994, xiii), for example, stated that all traditional library functions, the future of collection development is "certainly one of the most problematic.” Ferguson (as quoted in Brin 1994, xiii) talked about the paranoia of collection developers, and Cline (as quoted in Brin 1994, xiii) chided librarians to stop "bemoaning how bleak everything seems" in collection development programs. Why this edgy tone of uncertainty about the future of collection management? Certainly collection management practices and perspectives must change in the face of environmental shifts in information services and higher education, but will the basic goals and needs of collection management disappear as well?

When collection management as a field was being formed in 1979, Osburn (1979, 140) wrote that collection development would "have to be planned in two fundamental stages: one plan, whose rationale is service to the identifiable needs of the immediate constituency; and a second-stage plan, whose rationale is the integration of local development into the national systems of resource sharing in support of the long-range national academic research effort.” In fact, the second-stage plan that Osburn called for never came to fruition. For the last fifty years collection management has been primarily a print-based, local library activity. Collection resources, services, and policies have been developed almost exclusively around the needs of the immediate constituency, that is, local campus faculty and students. But with the primacy of local print collections being questioned in a networked, digital information environment, Osburn’s second-stage plan now might take first stage.

The academy itself has been hesitant and uneven in its adoption of new ways of doing its business. Even though the Internet was created by and for academic research institutions and government agencies, parts of the education-government complex have been slow to move to a networked, distributed operation. It is becoming evident, however, that fundamental change is taking place. Powerful technology infrastructures are being built on research campuses, and in many cases they are fully operational. More faculty and students are making dramatic changes in the way they learn, teach, and do research on and off campus. Faculty are reengineering traditional courses and developing new courses and even degree programs that are competing for students on their campuses and across the country who are willing to learn in a distributed environment. An example is seen in the master’s degree in library and information science offered at a distance from the University of Illinois. Nicknamed LEEP3, this highly regarded accredited program has been available since 1996 (www.lis.niu.edu/gisis/LEEP3)

With such changes taking place on their campuses, collection managers, subject specialists, and bibliographers
must move from a primarily local, print collection perspective to a broader vision of “knowledge management”—just as they had once been asked to move from “collection development” to “collection management.” Scholars and librarians must recognize that the library and higher education are inextricably bound together. As Battin and Hawkins (1998, 5) have observed, “The transforming impact of information technology cannot be confined to the library but imply a fundamental reorganization of the best institution. The digital library, as the epistemological center of the university, is certainly positioned to serve as the catalyst for transforming the university to meet the needs of the 21st century society dominated by electronic technology.”

Knowledge management in research libraries in the twenty-first century will require librarians to create new and expanded roles for themselves in the scholarly communications system. Librarians will have to play a much more active role in the creation of scholarly publications, whatever new multimedia and hyperlinked form those publications might take. They will have to assert aggressively their professional principles for free and unbiased access to the world of knowledge in the face of trends to commercialize and restrict access to information. Perhaps the most critical and difficult task facing knowledge managers will be to understand and fully exploit the potential of a networked, digital information system to overcome the narrower perspective of the “local” and the “immediate.” In the twenty-first century, knowledge management librarians just may achieve an ultimate goal: a freely accessible, integrated, and comprehensive record of serious scholarship and knowledge.

Collection management librarians, long knowledgeable of print collections and for the past decade struggling with the implications of the digital information system, should be leaders in organizing information resources in support of the new distributive learning environment in higher education. Librarians must now deliver resources and services online, synthesize and aggregate digital resources, help create new publications, and print collection management to new storage and electronic access and delivery options, and maintain and preserve the record of knowledge. All this must be done in a highly distributive, coordinated way.

Works Cited


JSTOR. www.jstor.org.


Metadata and Authority Control
Sherry L. Vellucci

A variety of information communities have developed metadata schemes to meet the needs of their own users. The ability of libraries to incorporate and use multiple metadata schemes in current library systems will depend on the compatibility of imported data with existing catalog data. Authority control will play an important role in metadata interoperability. In this article, I discuss factors for successful authority control in current library catalogs, which include operation in a well-defined and bounded universe, application of principles and standard practices to access point creation, reference to authoritative lists, and bibliographic record creation by highly trained individuals. Metadata characteristics and environmental models are examined and the likelihood of successful authority control is explored for a variety of metadata environments.

As the Internet becomes an accepted source of electronic information, librarians and information specialists around the world strive to improve methods for description, organization, and retrieval of remotely accessed documents and other electronic objects. They are not alone in this endeavor, for within many other sectors of our society the creators and providers of electronic resources are also engaged in attempts to manage this vast body of information. This has resulted in the simultaneous and parallel development of a wide variety of metadata schemes. Each group has approached the problem of organization and access from its own frame of reference, and included in its metadata model the type of information that best serves the needs of its own user community. It remains to be seen whether this proliferation of metadata schemes will improve description and access for library users, or only compound current problems. Much will depend on the ease with which metadata can be incorporated into current library systems and the compatibility of imported metadata with existing online catalog data. In other words, the successful use of multiple metadata schemes in the library environment will depend on authority control.

In this article, I offer a starting point for future discussions and research on metadata and authority control within the library profession. I provide an overview of metadata and discuss a few of the more popular metadata schemes associated currently with libraries, museums, archives, and information centers. These are examined within the context of authority control and its role in the future metadata environment.

Metadata: What Are They?

The most common definition of metadata is “data about data.” While accurate, this definition is so simplistic that it adds very little to our understanding of the concept. Further elaboration of the origins and use of the word will provide a framework for this discussion. Early use of the term “metadata” goes back to the
1960s, but it began to appear more frequently in the literature on database management systems (DBMS) in the 1980s. The term “metadata” was used to describe the information that documented the characteristics of information contained within databases (Phillips 1995). In this DBMS domain, the computer was the setting for both the information being described and the descriptive data, and, therefore, metadata operated within a totally electronic environment.

The parallel world of library cataloging traditionally used the terms “bibliographic data” or “cataloging data” for this type of information. Catalogers used these terms when both the objects they cataloged and the bibliographic records were in a nonelectronic form. Catalogers continued to call this type of information cataloging data when the bibliographic record migrated to the MArchine Readable Cataloging (MARC) formats. They even called it bibliographic or cataloging data when they began to organize and describe local computer files. But when catalogers began to describe networked electronic resources using the same type of bibliographic data, the terminology changed. Suddenly the MARC record became metadata, and the cataloger’s familiar world—circumscribed by the Anglo-American Cataloguing Rules (AACR) and the MARC formats—changed forever. This transformation was caused by a convergence with the broader world of information organization. The methods of organizing resources from the rather separate domains of library science, computer science, and information science all converged in this networked environment, and the term “metadata” became the commonly accepted term in all disciplines.

Some people in the library cataloging community balk at the term, noting that metadata are merely cataloging or bibliographic data by another name (Larsgaard 1996). This is true, of course, but there were some very good reasons for adopting this new terminology. The term metadata already had the connotation with an electronic environment that was lacking with the term cataloging; but more importantly, as catalogers expanded their own world view of information organization, metadata provided a common term to use when communicating with other information organizers in the computer and information science world. The term allowed everyone to interact equally in the continuum of information organization. This equality is important for the development of bibliographic systems that access, transfer, and manipulate metadata information across multiple databases in a way that provides meaningful information to the user. If, however, metadata are focused solely on electronic resources, there is danger of segmenting access to the wide spectrum of resources at the very time everyone is striving to make the continuum of information organization as seamless as possible. A broader perspective of both resources and information organization must be adopted by all constituencies in order to avoid perpetuating this type of segmentation, and the term metadata should be applied to data for all types of resources.

In order to place metadata within its proper context, I use the following expanded definition, which incorporates statements of functionality and environment: Metadata are data that describe the attributes of a resource; characterize its relationships; support its discovery, management, and effective use; and exist in an electronic environment. While this definition reflects the metadata ideal, in reality, most metadata schemes do not accomplish all of these functions equally well. Few metadata sets express relationships adequately. Many schemes concentrate more on resource discovery and retrieval than on detailed descriptions that act as surrogates for the object. This quickly becomes evident when comparing some metadata element sets to the data provided in a typical catalog record.

Before examining specific metadata schemes in more detail, it is important to understand the fundamental principles of authority control and why it is generally successful in our current catalog environment. Once the authority control success factors are understood, each metadata scheme can be analyzed to predict whether authority control will operate successfully when applied to that environment.

**Authority Control in the Library Environment**

Volumes have been written about the role of authority control in the online environment, but it is only recently that the concept of online was extended beyond the local online catalog. Taylor (1994) was among the first to discuss the issue of authority control in the broader context of the Internet. To date there has been little research in this area, and the question remains: Will the basic principles and processes of authority control work with metadata in the broader networked environment? Before we can answer this question, we must understand why authority control has worked so successfully in library catalogs.

Traditionally, the purpose of authority control has been to bring consistency to library catalogs. The authority control process is directed at the access points contained in catalog records, i.e., names, titles, and subjects. It ensures that these access points are unique and consistent in content and form, and provides a network of linkages for variant and related headings in the catalog. Reference to an authority file maintains consistency in controlled access points, while cross-references and the adjacent display of identical access points have been the primary methods used to accomplish the necessary linkages in the catalog. In Web-based catalogs, however, hypertext links are beginning to provide more direct catalog linkages.
Authority control is closely allied with the functions of the catalog. These functions, which were first defined by Cutter more than a century ago, continue to be the starting point for most discussions of authority control (Younger 1965). They are commonly described as finding, collocating, evaluating, and locating. Recently, the International Federation of Library Associations and Institutions (IFLA) Study Group on the Functional Requirements for Bibliographic Records (FRBR) translated these functions into “user tasks,” as part of an entity-relationship modeling exercise. The FRBR model suggests that catalogs should support the following four basic user tasks (IFLA 1998, 90):

1. To find entities that correspond to the user’s stated search criteria (i.e., to locate either a single entity or a set of entities in a file or database as the result of a search using an attribute or relationship of the entity)
2. To identify an entity (i.e., to confirm that the entity described corresponds to the entity sought, or to distinguish between two or more entities with similar characteristics)
3. To select an entity that is appropriate to the user’s needs (i.e., to choose an entity that meets the user’s requirements with respect to content, physical format, etc., or to reject an entity as being inappropriate to the user’s needs)
4. To acquire or obtain access to the entity described (i.e., to acquire an entity through purchase, loan, etc., or to access an entity electronically through an online connection to a remote computer)

Authority control plays a major role in helping the user successfully complete most of these tasks. It supports the finding task by ensuring that each entity has a unique name; that only one name is used for each entity; that variant name forms are represented and linked in some way; and that related names, titles, and subjects are collocated in the catalog. Authority control supports the identifying function by enabling users to distinguish among entities with similar names, titles, or subjects through the use of unique and consistent headings. While it can’t be said that authority control directly supports the selecting function, which depends on a wide variety of individual user needs, the access points provided by authority control could be influential in the user’s selection of a particular entity.

The final user task—obtaining access to the entity—is achieved by using the call number as a location device or shelf address. Classification as a location device works well for physical items found in local collections; however, with remotely accessed electronic resources, the means of “physically” accessing the object must be an accurate identifier of some type. At present, this identifier is most often the Uniform Resource Locator (URL)—an address notorious for its instability—that is now embedded in the bibliographic record. The success of the URL as a means of accessing the entity depends on accuracy in this location information. As a working solution, OCLC developed an authority control system called the Persistent Uniform Resource Locator (PURL) for handling these changing addresses (Jul 1997). In addition, work progresses on other naming devices such as the Digital Object Identifier (DOI) and the Uniform Resource Name (URN), and these may become the primary means of location identification. Interestingly, inclusion of this type of identifier in the bibliographic record does not currently fall within the rubric of the cataloging rules. While the USMARC format was revised to accommodate these locators, similar revision has not yet been made to AACR. The closest rule that exists in the latest version of AACR is for the standard number (i.e., ISBN or ISSN), which, although used as an identifier, is not a location address. It is likely, however, that when stable identifiers are developed for networked electronic resources and a standard is adopted by the networking community, these will become a part of the authority control process in some way.

**Authority Control Success Factors**

There are several reasons for the success of authority control, beginning with the fact that it operates within a well-defined and bounded universe—the library catalog. These catalogs should be viewed as value-added systems that describe and provide access to a highly selective, quality-controlled collection. A second reason for the success of authority control is that the creation of access points is based on principles and standardized practices that guide the process, including AACR and LC Rule Interpretations. In addition, authority work is aided by reference to authoritative lists such as the Library of Congress Name Authority File, the Library of Congress Subject Headings, Sears’s Subject Headings, or the Art & Architecture Thesaurus, to name a few. And finally, the cataloging process, and therefore authority work, is performed by highly trained individuals who are part of a library culture and understand cause and effect in the information retrieval process.

All of these factors contribute not only to the integrity of local library catalogs, but also to the success of shared cataloging on a national level. Cataloging within an international arena, however, presents new authority control challenges. Several authors and projects have identified difficulties that arise because of geographic, language, and cultural bias when attempting to implement international authority control and international bibliographic data transfer (Borgman 1997; Bourdon 1994; Dolsley 1988; Murtomaa and Greg 1994; REUSE 1997; Tillett 1996; Vellucci 1998). Borgman (1997) suggests that to operate
effectively in the international arena, each library must think globally while acting locally. This advice should also apply to the creation and use of metadata, but the metadata environment is even more complex because of the multiple schemes and structures involved. So, what are the possibilities for authority control within the global context of the metadata environment?

**Authority Control in the Metadata Environment**

I should begin by saying that there is no single metadata environment—which, of course, is the problem. Anything discussed here might apply to some metadata schemes, but not all. For example, the MARC bibliographic record is a metadata scheme to which authority control is applied regularly in terms of its data content and use. But this is the scheme employed most often in the controlled library environment; what happens when we go beyond MARC? What other types of schemes exist? What is the culture of these metadata communities? Is authority control feasible or likely in metadata schemes beyond MARC?

**Metadata Schemes and Architectures**

Many metadata schemes are currently in use or proposed for use within an information setting. The following list provides a sampling of the more well-known metadata sets:

- Computer Interchange of Museum Information (CIMI)
- Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata
- Dublin Core (DC) Metadata Element Set
- EDUCOM Instructional Management Systems
- Encoded Archival Description (EAD)
- Government Information Locator Service (GILS)
- IAFA Templates (IAFA/WHOIS++)
- USMARC Formats
- Resource Description Framework (RDF)
- Text Encoding Initiative (TEI) Header
- Visual Resources Association (VRA) Core Data

Some of these metadata schemes are general in nature—such as the MARC format or the DC—and are designed to accommodate information about electronic resources in a wide variety of disciplines. Other metadata schemes are more specialized—such as CIMI and the FGDC Content Standards for Digital Geospatial Metadata—and apply to digital information in a specific format or within a specific discipline or domain. What they all have in common is that they contain a set of defined data elements that describe the entity and help provide access to it in the electronic environment. Beyond that, they all vary as to the number of data elements, the content of the data elements, and the standards used, if any, for that content. In addition, some of these metadata schemes extend beyond the traditional functions of description and access to include resource management and use information such as terms and conditions data, administrative data, content ratings data, provenance data, linkage or relationship data, and structural data.

**Metadata Characteristics**

There are three basic characteristics common to all metadata schemes: (1) syntax, (2) semantics (i.e., content), and (3) structure. A scheme’s syntax can range from a highly complex format, such as the MARC record or the SGML-encoded TEI header, to a basically unstructured scheme, such as the original DC. The semantics can include scores of complex data elements, whose content is prescribed by standards and rules, or it can have as little as two or three elements with no control at all over that content. Metadata can be contained in a variety of database structures (or architectures), including library catalogs, commercial database packages, or the recently formalized RDF standard. With increased importance placed on global access to information and system interoperability, many of the new metadata schemes avoid the more complex syntax and rigid semantic content prescribed by library cataloging rules, MARC formats, controlled vocabularies, and traditional classification schemes. In some cases, however, metadata users and creators want more from their metadata than a simple structure can offer. As a result, some schemes are being modified to include more elements, more data qualifiers, and a more complex structure. In addition, a few metadata sets (e.g., the DC and EAD) have added tagging conventions to support the use of authoritative data for names and subjects, and to indicate the authoritative sources for controlled headings.

**Metadata Buzzwords**

Flexibility, interoperability, and extensibility are the new buzzwords in digital information organization, and each of these concepts will influence, or be influenced by, authority control of metadata. Flexibility allows the metadata creator to include as much or as little detail as desired in the metadata record, with or without adherence to any specific cataloging rules or authoritative lists. Flexibility in the amount of metadata detail does not present problems for authority control. The various levels of description prescribed by AACR and the Program for Cooperative Cataloging core records already demonstrate this. Flexibility with regard to rules and authoritative lists for data content
and form, however, would make authority control very difficult indeed.

Interoperability, as defined by Borgman, refers to "the ability of information systems to interact in a useful way on a real-time basis over communications networks" (Borgman 1997, 231). For the sake of interoperability, many believe that the metadata record should contain a basic core set of data elements that would be common to all schemes. This would facilitate the exchange and use of metadata in a variety of systems and is the basic premise of the DC. Crosswalks offer a way to map the data elements from one metadata scheme to another and are a major part of the interoperability factor. Several crosswalks currently exist to map the MARC format to and from other popular metadata schemes such as the DC and GILS (Day 1997). These crosswalks focus on transfer architecture and syntax, however, and do not address interoperability in terms of the standards used for data content and form. Thus, while it would appear that authority controlled data would improve interoperability, it is not a requirement for the physical transfer of the data. Authority control becomes an interoperability issue only when metadata from various sources and in various formats need to be integrated and manipulated for efficient use.

The final buzzword—extensibility—means that the scheme should allow the addition (extension) of data elements and data qualifiers to accommodate specific user needs (i.e., be domain specific). The danger with extensible data is a lessening of interoperability, because the more the general metadata elements are qualified or extended on an individual or domain specific basis, the less compatible or interoperable the metadata become. Extensibility, however, is not necessarily a problem for authority control. In fact, many of the data qualifiers being added to metadata schemes are designed to identify the rules or authoritative lists used to control the content of a given field, and, as such, they enhance metadata authority control.

**Standard Generalized Markup
Language-Based Metadata**

Just as the MARC format provides the encoded record syntax for most online catalogs today, markup languages form the encoded syntax for many documents found on the Internet (Gaynor 1996). Unlike MARC, however, where the bibliographic record is separate from the document that it describes, markup languages can be used to encode both the descriptive data and the object. This allows metadata to be embedded within the document itself. Standard Generalized Markup Language (SGML) is one of the most common markup languages used for metadata, along with its related codes HyperText Markup Language (HTML), and the newer Extensible Markup Language (XML). The following sections examine two of the more popular metadata schemes that use SGML: TEI headers and EAD.

**TEI Headers**

One of the earliest metadata schemes to use SGML was developed within the scholarly communities of literature and linguistics. A common encoding scheme was needed for complex textual documents in order to facilitate the exchange and use of the growing corpus of electronic texts in the humanities. The TEI developed guidelines for the preparation and interchange of electronic texts in the broadest sense of the term, including both textual and non-textual resources in electronic form (Sperber-McQueen and Burnard 1994). The TEI also developed guidelines for descriptive documentation for each TEI encoded document. This required documentation is called the TEI header, and much of its data content is similar to title page information.

TEI headers consist of four components that provide details about the text, its source, its encoding practices, and its revision history: the File Description (demarked by the tags <fileDesc> and </fileDesc>); the Encoding Description (with <encodingDesc> and </encodingDesc>); the Profile Description (<profileDesc> and </profileDesc>); and the Revision Description (<revisionDesc> and </revisionDesc>). This TEI header information can be embedded within the TEI-conformant text that it describes (such as header information in HTML encoded Web documents), or it can be maintained in a separate file and point to the electronic text (such as the bibliographic records in a library catalog).

The File Description is the only required component of the four TEI Header segments. AACR cataloging standards were used as a model for this portion of the header. The elements that make up the File Description (and which roughly correspond to the areas of International Standard Bibliographic Description [ISBD]), consist of the following components:

- **Title Statement:**
  
  <titleStmt> . . . </titleStmt>

- **Edition Statement:**
  
  <editionStmt> . . . </editionStmt>

- **Extent:**
  
  <extent> . . . </extent>

- **Publication Statement:**
  
  <publicationStmt> . . . </publicationStmt>

- **Series Statement:**
  
  <seriesStmt> . . . </seriesStmt>

- **Notes Statement:**
  
  <notesStmt> . . . </notesStmt>

- **Source Description:**
  
  <sourceDesc> . . . </sourceDesc>
Three data elements are mandatory in the File Description segment: the Title Statement, which includes both title and author data; the Publication Statement; and the Source Description. The Profile Description segment of the header, which describes the content of the document rather than the document itself, contains the data elements for controlled vocabularies.

Just as there are various levels for description in the cataloging world, the amount of data in a TEI Header can range from very simple to extremely complex, depending on the nature of the text, its intended use, and the creator of the metadata. In general, TEI headers are created by the person who created the full electronic text; in other words, people who might have little knowledge of authority control or the concept of uniform name headings. Some institutions, such as the University of Virginia, are applying content standards to this metadata—that is, ISBD, AACR, and authority control for names and subjects (Shieh 1998). This is an institutional policy decision, however, and requires cataloger intervention to review and revise the header data after creation; these content standards are recommended but not mandated by TEI guidelines (Sperberg-McQueen and Burnard 1994). Currently, there is no official TEI-MARC crosswalk to map information from the TEI Header to the MARC record, although the University of Virginia developed and uses its own model.

The Encoded Archival Description

Another SGML-based metadata scheme was developed more recently within the archival community. Motivated by the increased role of networks in accessing information and a desire to expand on the data provided in the MARC record, a cooperative project based at the University of California, Berkeley developed a nonproprietary SGML encoding standard for machine-readable finding aids—the EAD (Thibodeau, Pitti, and Barry 1996). EAD was designed as a data structure and communication standard for the inventories and registers created by archives, libraries, museums, and manuscript repositories to support the use of their holdings. Such finding aids typically describe a unique collection, its intellectual organization, and its components; therefore, finding aids are metadata within their own right. The EAD finding aid document consists of three segments: the Header (<eadheader> ... </eadheader>); Front Matter (<frontmatter> ... </frontmatter>); and the Finding Aid (<findaid> ... </findaid>)

The developers of EAD borrowed several concepts from the TEI, including the use of a header to contain information about the rest of the encoded document—in this case, the finding aid. Thus, the EAD Header is meta-metadata, that is, it is information that describes descriptive information. The header is required by the Document Type Definition (Library of Congress 1997), and provides information that describes the finding aid itself, such as might be found on an “electronic title page.” The EAD header consists of the following five data segments:

- EAD Identifier:
  <eadid> ... </eadid>
- File Description:
  <filedesc> ... </filedesc>
- Profile Description:
  <profiledesc> ... </profiledesc>
- Revision Description:
  <revisiondesc> ... </revisiondesc>
- Footer:
  <footer> ... </footer>

Like the TEI header, the File Description segment of the EAD header provides the basic bibliographic data, but these data are about the finding aid, not the collection being described. Data describing the collection, which catalogers normally think of as bibliographic data, are contained in the Archival Description element (<archdesc> ... </archdesc>) of the Finding Aid portion of the document.

As with many metadata schemes, EAD defines structure and content designation. Like the TEI guidelines, it recommends the use of content standards for collection description. EAD differs from other metadata types in that it accommodates multi-level, hierarchical descriptions that are necessary in the archival environment. Typically, MARC records for archival materials provide collection level descriptions, while finding aids might describe at the collection, series, file, or item levels. The information at the collection level, therefore, is most often mapped to the MARC record, and it is at this level that the archival community frequently applies the recommended cataloging standards of AACR and the related cataloging guidelines for Archives, Personal Papers, and Manuscripts (Hensen 1989).

Encoding tags for controlled access points are an important authority control aspect of EAD. These tags allow the authoritative heading and its source to be identified. From its inception, the developers of the EAD displayed a high level of awareness of basic cataloging standards, and while adherence to these standards is not mandated, it is strongly recommended. Thus, the EAD metadata structure was designed to accommodate standards and, therefore, authority control, if desired.

The Dublin Core Element Set

Fast becoming the metadata scheme of choice for general library use, the DC was named for the site of the first Metadata Workshop held in Dublin, Ohio. It is maintained by OCLC and was developed within an international and
interdisciplinary environment through the collaboration of various Internet communities. The DC defines a set of 15 basic data elements for resource description and retrieval (Dublin Core 1997). The 15 elements, many of which correspond to data in traditional catalog records, are divided among three information categories: Content (Title, Subject, Description, Source, Language, Relation, Coverage), Intellectual Property (Creator, Publisher, Contributor, Rights), and Instantiation (Date, Type, Format, Identifier) (Hillman, 1998).

Designed for simplicity and flexibility, the DC is not governed by mandatory rules. All elements are optional, all elements are repeatable, the order of elements is optional, and all elements can be qualified. Included among the optional qualifiers is the qualifier "scheme," which identifies the authority or standard that is used for that particular metadata element's content. Initially, the DC was designed to be syntax independent; that is, no rules of grammar were mandated for the data so that the data elements could be used in many different environments and with any type of database architecture. But implementation of DC projects required a syntax that could be used consistently on the Web without changes to existing Web standards and software. HTML <META> tags were adopted by many early projects as the preferred syntax, and are currently in the process of becoming a formalized standard; however, since the Resource Description Framework's (RDF) approval by the World-Wide-Web Consortium (W3C) as a structural standard, XML has become the recommended syntax for use with the more sophisticated RDF architecture (Miller 1998).

The DC was originally conceived for author-generated description of general Web resources, and several metadata authoring tools based on the DC have been designed for a nonlibrary market. Tools such as Meta Tag Builder use forms to prompt Web page developers to include DC metadata for their Web documents at the time of document creation. In this context, DC metadata is intended to provide useful information to enhance indexing by Internet search engines. Other authoring tools such as DC Dot will automatically seek out an existing Web page and generate the DC HTML <META> tags. There is little likelihood, however, that Web page creators who generate metadata outside the library and information environment will have any understanding of authority control; and while many of the DC data elements such as Title, Creator, and Subject correspond to areas presently under authority control in library catalog records, the DC does not mandate that data form or content conform to any particular rules or guidelines.

Figures 1 and 2 demonstrate the flexibility of the DC in terms of content. Figure 1 shows an example of some basic DC data elements with HTML <META> tags. A Web-site developer who wanted to provide data for Internet search engines to index created these metadata, which contain free text data and are technically correct by DC standards.

Figure 2 shows DC metadata for the same Web site, created by a cataloger according to cataloging standards and conventions, for eventual conversion to a MARC record. It is also technically correct by DC standards.

These DC examples show that a given metadata's accommodation of standards for data elements is not enough to ensure successful authority control. It is a necessary first step, without which the remaining discussion is pointless, but it is only one part of a complex system. Ultimately, effective authority control also depends on the environment in which the metadata are created and used.

The Metadata Environment and Culture

Weibel, the driving force behind the DC, offers three different models for the metadata environment (Weibel 1997). The first is the "embedded model," where metadata is formulated by the creator of the electronic document and resides within the resource being described using the HTML <META> tag. In this first model, the metadata are integral to the resource, require no additional organizational system to be used, and can be harvested by Web indexing agencies. This is an increasingly popular Internet metadata model, as the general Internet user population becomes aware of metadata and search engines are reconfigured to exploit the HTML <META> tags.

The second model is the "third party metadata model," where an agency creates, collects, and manages separate metadata records that refer to resources but are not embedded in the resource. This model requires an organizational system to use the metadata and is exemplified by bibliographic records in a library catalog. This second model might link the separate metadata records to their

```
<META NAME = "DC.title" Content = "Welcome to My Metadata Home Page">
<META NAME = "DC.creator" Content = "Ima D. Expert">
<META NAME = "DC.subject" Content = "Hot Metadata Sites">
```

Figure 1, Dublin Core Uncontrolled Content

```
<META NAME = "DC.title" Content = "Metadata Home Page">
<META NAME = "DC.creator" Content = "Expert, Ima D., 1975:">
<META NAME = "DC.subject" Content = "Metadata">
```

Figure 2, Dublin Core Controlled Content
electronic resource using the HTML `<HREF>` tag and the URL address.

Weibel's third model is the "view filter model," where a distinct agency manages many metadata records from a variety of sources that use different metadata structures and maps these variant metadata sets into a common set such as the DC. This third model provides users with a single query construct and facilitates a cross-disciplinary network infrastructure. It is dependent on a metadata architecture such as the Warwick Framework (Lagoze1996) or the RDF (World Wide Web Consortium 1997) to facilitate the data transfer and mapping. SOLINET's Community Planet project is one example of this model.

The four authority control success factors discussed earlier (controlled operating environment, trained provider, application of standards, and reference to authoritative lists) correlate to several factors in Weibel's models of the metadata environment. All three models address the issues of where the metadata reside and how they are used. These factors map to the first authority control success factor; controlled operating environment. At issue for authority control, however, is not so much whether the metadata are embedded within the document or maintained as separate records, but rather what type of "organizational system," to use Weibel's phrase, is used to exploit the metadata. Indeed, this is one of the most important factors in successful authority control. If the organizational system is designed to implement the controlled vocabulary uniformly, access points, and syntactic structure created by the authority control process, then authority control can flourish in the metadata environment. The organizational systems of Weibel's second and third models can be so designed. If, however, there is no organizational system, as in the first model, or if the organizational system is not designed to take full advantage of standardized metadata content, then authority control can be only partially successful at best. Thus, the operating environment is critical to the success of authority control.

A second factor in Weibel's metadata models addresses the issue of who provides the metadata, which will determine whether the metadata content is standardized. These issues map to two success factors: the trained provider and the application of standards. In some cases, the author of the document will provide the metadata, especially when the metadata are embedded or contained within the document. Although there has been some attempt to ensure that a few select data elements are included in metadata created by the use of authoring tools such as Metri Tag Builder (which uses DC.Lite—a pared down version of the DC element set), there is little likelihood that Web-page creators in general will apply content standards to metadata. This lack of standardized metadata content in the majority of Web sites, while creating difficulties for the average Web surfer, is beyond the control of the library and information community (just as much information is not collected and cataloged by libraries today). Only when these metadata are brought into an organizational system within its purview can the library community successfully apply standards to the data.

Templates also were developed to encode documents and create headers for several metadata schemes used within the information community, including the TEI, EAD, FGDC, and DC. Often developed for a particular project, these templates prompt the creator to include a specific data element, but, again, this will not guarantee that content standards for authority control of names, titles, or subjects will be applied. There is, however, greater awareness of the existence of cataloging standards among those who use these metadata schemes, and, therefore, the likelihood of standardized metadata content may be greater within these metadata communities than it would be among Web site creators in the general population.

Information specialists and catalogers will create metadata for only a small percentage of electronic resources, concentrating primarily on high quality and long-lasting documents. In these cases, authority controlled data content should be the norm. It is likely, however, that a larger body of bibliographic records will be derived from a variety of existing metadata; in fact, I predict that this will become a major part of the future copy cataloging process. Currently, the existing metadata must be reviewed by catalogers to ensure adherence to authority control standards before integrating these metadata records into authority controlled catalogs. Authority control productivity tools, such as Northwestern's Toolkit (Strawn, 1995), could further automate this process, and the potential exists in future environments, such as Weibel's third model, for the organizational system architecture to process existing authority data automatically.

This prospect leads to the last authority control success factor—reference to authoritative lists. While this factor is not overtly discussed in any of Weibel's models, it is an implicit component of both the second and third models. Certainly, reference to authoritative lists is part of the authority control process for library cataloging exemplified in the second model; but Weibel's third model also will depend to a great extent on this type of referencing, although these authoritative lists most probably will be called data registries. In the RDF metadata model these authoritative lists or data registries provide meta-metadata that can be used: (1) to identify the metadata type from among various schemes; (2) to verify and validate a particular metadata element's semantics and syntax; (3) to verify the agency that created the metadata; (4) to verify specific standards used for data content and form; (5) to identify specific resources; and (6) to exchange data elements among metadata packages. These authority links are necessary not only because of the variety of metadata schemes, but also because of the many different content standards and subject lists used in various disciplines. Weibel's third model, there-
fore, will require extensive building of authoritative data registries and extensive relationship modeling.

Finally, the various metadata environments can be viewed as cultures within which the metadata creators operate. The value system imposed on information organization within each culture will determine the extent to which authority control succeeds in terms of data integration for library systems. These cultures can be grouped into three broad sections: the library cataloging culture, the scholarly information culture, and the popular information culture.

In the library cataloging culture, authority control flourishes. Metadata providers are highly trained professionals whose primary job is the creation of metadata. They are not only aware of the need for authority control, but practice it on a daily basis, especially when functioning in a networked environment that includes shared bibliographic data. Until recently, authority controlled metadata in this culture was almost exclusively in the form of MARC records; but as awareness and understanding of other metadata schemes increases, catalogers are eager to extend the benefits of their authority control knowledge to other systems.

The scholarly information culture consists of many different groups, defined primarily by discipline, each with its own metadata scheme (e.g., TEI, EAD, FGDC, CIMI, VRA, etc.). Often, those who developed the metadata schemes were aware of the concept of authority control and accommodated it to some extent in the metadata's syntax. In this culture, metadata creators might be concerned with the creation of information as well as its organization, and while they frequently operate in close proximity to the library cataloging culture, usually they are not part of it. Authority control may exist, but often uses standards that differ from those in the library cataloging culture. Increased communication between the library cataloging culture and the scholarly information culture resulted in the development of crosswalks and data conversion processes for the exchange of metadata between these two cultures.

The popular information culture is primarily concerned with creating and sharing information, rather than organizing it. In this culture, metadata creators have almost no contact with the other two cultures and are not aware of authority control concepts. HTML <META> tags, when used, generally contain natural language and uncontrolled content. It is highly unlikely that content standards will be applied in this culture and a great deal of work is required for the library cataloging culture to make use of any metadata created in the popular information culture.

**Beyond MARC: Future Possibilities**

The potential for authority controlled metadata certainly exists; however, it will not be universally applied in all sectors of the metadata environment. Multiple metadata schemes can be used in the library environment in a variety of ways, but the transfer and conversion of these metadata records into bibliographic records for use in current library catalogs requires both accuracy in structural mapping from one system to another and data compatibility in terms of content and form. On the surface, crosswalks appear to provide a simple means of exchanging data. For example, the DC Title element maps to the 245 field in USMARC; few things in the world of metadata, however, are as simple as they seem. No metadata crosswalks work equally well in both directions. Mapping 15 DC metadata elements into MARC may not seem difficult, but as additional element qualifiers are implemented to improve resource description, the mapping difficulty increases. In addition, mapping a standard MARC record into 15 simple Dublin Core elements presents a real challenge. Much of the data-rich MARC record is lost in the process. To date, the effective use of crosswalks for data exchange has been only partially successful at best.

The metadata community is looking in another direction for solutions to the problems of structural mapping and data compatibility. Recent activities of the DC Metadata Initiative indicate that several areas currently targeted for improvement may eventually solve some of these problems (Weibel 1999). These activities include: (1) formalization of the DC maintenance process; (2) formal standardization of the element set; (3) mechanisms for addition to data qualifiers, and (4) implementation of the RDF.

The DC developers recently completed an organizational restructuring that provides an explicit process for decision making. In addition to policy and technical advisory committees, the new structure provides for working groups to address particular problems with the metadata scheme. Similar to other agencies such as the W3C or the Internet Engineering Task Force, the new directorate created a formal process for ratifying changes to the DC with input from various communities. Prior to the next stage of formalization, which is submission to both NISO (National Information Standards Organization) and CEN (Center for European Normalization) for status as an official standard, the data element definitions will be reviewed to improve clarity and promote more consistent application. Additionally, the data elements themselves will be formatted according to ISO 11179, a standard for formally expressing the semantics of data elements. Formalization of the standard and standardization of the element set is a critical step that will provide stability for structural mapping.

Data element qualification is another area targeted for improvement. While the basic 15 elements of the DC have remained stable for three years now, virtually all DC applications have adopted element qualifiers to accommodate better precision in resource description than the basic
model supports. This highlights the paradox that exists in the DC community: on one hand, the more elements and element qualifiers that are added, the less interoperable the data become; on the other hand, no one is really satisfied with the quality and level of description afforded by the basic element set. The ability to add standard qualifiers to the DC elements would improve the scheme, especially in the area of authority control. Standard qualifiers would: (1) increase semantic specificity by allowing controlled vocabularies or classification schemes to be identified and used for either description or as a formal browsing structure; (2) allow authority controlled data to identify a name, title, work, object, etc.; and (3) allow definition of a formal substructure so that compound values can be assigned to one element. Provision of formal qualifiers that identify standards used to control data content and form should allow greater specificity without reducing interoperability. The RDF will play a critical role in this solution, for although the qualifiers will provide improved precision, it is the data structure that allows specific data values to be clearly identified and associated with specific metadata schemes, functions, roles, or actions.

The RDF

The RDF is a set of conventions for expressing metadata that uses XML as an encoding standard and provides a framework for exchanging metadata. A Universal Resource Identifier (URI) is used for naming purposes, and each resource has properties that describe it. By using the XML-namespace facility, RDF associates each property with its associated metadata schema that defines the property, thus allowing data elements from different metadata schemes to reside together without confusion or conflict. The ability to specify metadata schemes in RDF makes it possible for applications to access a particular scheme from a publicly accessible registry on the Web and retrieve the parsing structure and semantics of the element set. In addition, this data model allows elements to reference data registries (i.e., authority files), thus providing a sophisticated version of authority control. Figure 3 shows an example of one possible RDF record construct.

If the DC is moving in the direction of formalization, standardization, increased descriptive data, and authority controlled data elements, in other words towards cataloging data as we know it, are these new metadata schemes just reinventing the wheel? I believe the answer is "no," because they are designed for use with a structural data model that will allow the computer to do what it is good at: computation and connectivity. This, in turn, gives us the potential to develop integrated library systems that can contain multiple databases that use multiple metadata schemes, employ sophisticated relational linkages, and provide unified inter-

faces, all without beginning from scratch. These changes will not happen overnight. They will require catalogers to expand their concepts of authority control, for although the underlying goals will remain the same, the authority control process will change. Catalogers must learn several metadata schemes and organizational structures beyond AACR and the MARC record. They must free themselves from thinking in terms of flat files and linear access and begin to think in terms of multischeme data registries, new record constructs, and relational data models. They must envision a new spectrum of authority control that includes many types of identifiers along with the more familiar names, titles, and subjects. And most critically, catalogers must actively participate in the development of system architectures and data registries. Only this level of activity will ensure that catalogers play a key role in the development of authority control systems for electronic resources. Will metadata ever be totally under control? Probably not, but new frameworks for description and data transfer models based on authority control principles can provide a wider range of data sources for future catalogs.

Works Cited


Notes on Operations

The Selection Connection

Creating an Internal Web Page for Collection Development

Julie L. Rabine and Linda A. Brown

Collection development librarians often use Web resources as they select materials, but only a few libraries have built working Web pages for this purpose. We suggest that a collection development Web page is a valuable asset to an academic library. A Web page designed for internal use can be used to share information among selectors and can provide a single source for links to Web tools used by collection development librarians. We discuss sources of Web-based bibliographers’ tools and suggest useful types of information to include on collection development Web sites.

Collection development librarians have traditionally spent time poring over reviews, bibliographies, approval plan profiles, and other selection tools to select resources that will best meet the current and future needs of library patrons. The advent of computer networks and the proliferation of the personal computer have given us increased access to the information needed to make selection decisions, as well as provided a new universe of resources to collect. The World Wide Web permits us to find book reviews in hundreds of sources, search for an elusive out-of-print title, or connect directly to our approval vendor’s site to verify volumes shipped or review our approval profile. Identifying and evaluating Web resources for inclusion in the library’s catalog or a subject-oriented Web page are becoming regular features of our work.

Since the early days of the Web, acquisitions librarians have seen the value of creating Web sites that would bring together useful resources to help librarians work more effectively (Leiserson 1997). Collection development librarians can also benefit from this approach. A collection development Web site gives a library the means to custom-build a toolkit for its own selectors (Brown 1999). This toolkit can provide:

- tools to enable selectors to work more efficiently at traditional tasks;
- tools specifically for the selection of Web resources; and
- a medium to communicate with our constituencies.

We will describe the collection development sites at Bowling Green State University (BGSU) and other libraries. We will discuss the kinds of tools useful to include on a Web site designed for those working in collection development and suggest places to find these tools.

Collection Development Web Sites

In early 1996, BGSU Libraries and Learning Resources staff began to design a Web site as part of a campuswide effort to develop a Web presence. The various library units and departments began work on Web pages that would present useful information from their respective areas.
That summer the collection development Web site (www.bgsu.edu/colleges/library/infosrv/collman/cmpages/cmpage.htm) was mounted. The site was aimed at our selectors in particular, the rest of the Libraries and Learning Resources staff in general, and anyone else on the BGSU campus with an interest in library collections.

Initially the site included a directory of selectors and departmental library representatives, a monthly list of newly acquired books, a page of news about the collections, and the collection development unit’s mission statement. In 1997, the unit completely overhaulèd the general collection development policy and converted it from a linear print document to a fully integrated hypertext document. This policy was added to the Web site to make it readily accessible to all library staff and the university community; it does not exist on paper. The most recent addition to the site is a page of bibliographers’ tools, first posted in 1998. This feature is continually being augmented with useful resources recommended by the bibliographers. Many of our bibliographers’ tools will be described later, but some of our more recent additions include links to MX Bookfinder, the New York Times Book Review, a currency converter, and the staff-oriented pages produced by OhioLINK, our statewide consortium.

In preparation for this article, we searched for collection development Web sites at other institutions using AltaVista and other search engines with the following search strategies: collection development and (library or libraries); or collection development and department. Our search yielded tens of thousands of hits; many were irrelevant or duplicative. Because the search engines rank hits by relevance, and to create a manageable workload, we scanned the first thousand hits. We reviewed all of the pages that appeared to be academic library collection development department sites. We also checked some of the metasites described below, such as ACQWeb and T-POT, and discovered additional links to collection development Web sites that were not found in the Alta Vista searches. Virtually any library with a Web site and a collection development staff had a collection development staff directory and perhaps a list of subject liaisons as well. Although it is difficult to obtain an exact count, scores, if not hundreds, of libraries also have some form of a collection development policy mounted on their Web sites.

Through the searching outlined above, we identified about twenty collection development Web sites that had more than a simple staff directory or a collection development policy. Some of the larger sites had links to other useful collection development sites; others had information for faculty, vendors, or others outside the library. The sites listed below are well-rounded and provide information not commonly encountered; they serve as good examples of what information can be offered by a collection development Web page.

The University of Texas General Libraries Collections & Information Resources Division (www.lib.utexas.edu/cird). Notable features include extensive lists of links related to various budget and collection issues in academic libraries; collection news; collection and publishing statistics; and an acquisitions manual for faculty. The most unusual feature is an interactive survey form asking users their preference between print and electronic journals.

The University of Wyoming Libraries Collection Development Office (www.lib.uwyo.edu/cdlo/default.htm). Striking features include: numbers and costs of serial titles cancelled and added; budget information; trial databases; and an internal newsletter published by the department.

The Louisiana State University Libraries Collection Development Department (www.lib.lsu.edu/colldev/cdm.html). Interesting features include: full text of articles published by the collection development staff; links to vendors’ sites; links to local information including a staff development schedule; and notes from the previous year's staff development workshops. It also includes collection development tools and policies, and a list of newly received materials.

The University of Maryland Libraries Collection Management and Special Collections Division (www.lib.umd.edu/UMCP/CLMD/collbuilding.html). Presents gifts information; materials selection process; collection statistics; collection development policies; resources for selectors; and a directory of selectors. The information about gifts to the University Libraries includes policy regarding appraisals and possible tax deductions.

**Literature Review**

A number of authors address aspects of a Web page for collection development or provide good ideas for collection development Web page content, although none provides an overview of the subject. In a general discussion, Henderson (1996) promoted the use of Web resources for acquisitions work, some of which spills over into collection development. For example, sites for bibliographic verification or current awareness are useful for both acquisitions and collection development. Her definitions and short explanation of Web basics provide a good introduction to Web page development for the uninitiated. Johnson (1997) examined 31 acquisitions and collection development Web pages and listed their contents. He focused on design rather than content, and through his critique of several sites, provided insight into Web design features that work well. He also offered ideas for content in suggesting useful links to include on a collection development Web page.
Arlen et al. (1998) and Bybee et al. (1998) each offered an excellent review of sites and metasites that could be useful tools and sources of tools for selectors. Other authors addressed more specific issues related to collection development. Johnson (1998) provided a synopsis of a 1998 ALA Midwinter ALCTS Out-of-Print Discussion Group session, and examined the changes in the out-of-print market brought about by the Internet. A brief discussion of copyright sites with an accompanying list of government sites was published in Information Outlook (Copyright resources 1998). Balas (1997) discussed Web resources that address preservation issues in both the traditional and digital realms. Smith (1998) surveyed the Web pages of major book and serial vendors, which frequently contain useful tools and information for collection development librarians. Since the Web became available, librarians have been concerned with selecting useful and accurate Web resources. Piontek and Garlock (1995) outlined strategies for identifying and evaluating free Web sites. Rioux (1997) gave a rationale and general evaluation criteria for selecting any type of Web resource. Her reasons for selecting and suggestions for evaluating Web resources paralleled traditional standards for print collection development.

If your library deals frequently with vendors that have Web sites, those sites would be valuable additions to a collection of tools. A book vendor's database might be searchable, might allow specific items to be marked for order, or might allow orders to be placed electronically. Often customized reports can be generated online to track local purchasing patterns. Serials vendors also can offer searchable databases of periodicals and series, online subscription renewals, or document delivery services. In addition to links to the vendors dealt with directly, links to other vendor Web sites might be considered. Many book and serial vendors have mounted collection management information on their sites such as documentation of pricing and publishing trends, policy information, and links to other Web sites. Smith (1998) reviewed and described major vendor sites and their features.

A number of bibliographic and research databases, such as Books in Print, Ulrich's International Periodicals Directory, ERIC, Library Literature, Book Review Digest, and WorldCat, are convenient and useful to have on the desktop if they are subscribed to locally. Selective inclusion of library science electronic journals, whether free or subscription-based, can help collection development librarians stay up to date. Some of these sites also include book reviews in subject areas of interest; such sites include, for example, CHOICE (subscription), American Libraries (http://ala8.alala.org/alonline), Library Journal Digital (www.bookwire.com/ljdigital), and LIBRES: Library and Information Science Research Electronic Journal (http://aztec.lib.utk.edu/libres) (all free). Discipline-specific e-journals that provide book reviews in particular subject areas are also appropriate.

Links to professional organizations or scholarly societies can be helpful to selectors, whether these organizations are library or subject related. The American Library Association site (www.alaa.org) gives library news and information about conferences, while users can select divisions and sections for relevancy to collection development activities or the subjects collected at a given library. The Scholarly Societies Project (www.lib.uwaterloo.ca/society/overview.html), produced by the University of Waterloo, lists links to more than 1,400 scholarly society home pages. Visiting this site is an excellent way to find more specialized library associations as well as societies devoted to the disciplines collected at a library. Because many scholarly societies are also publishers, this site can be a useful reference source for bibliographers in its own right.

In addition to the items already discussed, the bibliographer's tools page could also include links to online bookstores and book review sources, guides to Internet resources, and technical services resources. These links not only save steps, but also serve as a valuable reminder that these resources are available.

The collection development Web page can be a convenient way to provide access to current policies, procedures, and other useful local information to all selectors. These can be updated as necessary, and selectors can easily reach them without tracking down the collection development officer or keeping their own files.

We found that a collection development policy works especially well as a hypertext document. When we were revising the BGSU policy (www.bgsu.edu/colleges/library/infosrv/cdpolicy/cdpolicy.htm), the flexibility in structure that hypertext offers allowed us to bring together related sections of the policy while avoiding repetition. We could easily refer to core selection criteria, priorities, collection levels, and other foundational information wherever they were needed by adding a hypertext link. Scattered references to a single
topic, such as BGSU’s role in the OhioLINK consortium, could be linked to one brief document providing the necessary background information.

Detailed collection development statements for each discipline represented on campus can be linked to the main policy and to each other where cross-references are desirable. While BGSU’s subject-specific statements are still largely in the planning stages, other libraries are closer to finishing this task. The University of Pennsylvania Library is working on a project to make its collection development policies available on the Web (www.library.upenn.edu/services/collections/collections.html). The subject-specific portions of the policy are nearly complete and are a good example of a detailed and comprehensive policy.

In addition to local library materials, bibliographers can also take advantage of the own institutions’ Web pages, which can provide information vital to the collection building process. A Web-based course catalog, if available, would be a worthy addition to a collection development page. Facts and figures on enrollment by major and by class standing are also sometimes posted to the Web by universities and are useful to the selector. Academic departmental Web pages often contain information on programs, curricula, faculty research interests, and upcoming events that could be helpful to the selectors working with individual departments.

**Library Metasites**

The best place to start looking for potential bibliographers’ tools is often a library-related metasite where much of the work has already been done. The builders of these sites have selected useful resources and organized links to them. Explore these sites to find individual links that will be useful to your selectors, or add a link to the whole metasite. Many of these sites are also searchable, adding to their usefulness. Arlen et al. (1998) and Bybee et al. (1998) discussed and described a number of metasites directly related to collection development and acquisitions. We will focus here on several that have found to be particularly useful.

**AcqWeb** ([www.library.vanderbilt.edu/law/acqsl/acqsl.html](http://www.library.vanderbilt.edu/law/acqsl/acqsl.html)). This Web site is based at Vanderbilt University, has excellent comprehensive coverage, and is international in scope. It is intended to be the “acquisitions and collection development librarians’ and staff’s gateway to the world of publishing” (Cook 1997, 40). The Collection Development subdivision offers links to sites for selecting Web resources, book review sources, and a list of collection development policies. AcqWeb includes a link to A Tool Kit of Links and Documents for Collection Development and Management Librarians ([http://ublib.buffalo.edu/libraries/units/cts/acq/cdl](http://ublib.buffalo.edu/libraries/units/cts/acq/cdl)), which lists dozens of resources for bibliographers. AcqWeb also includes links for publishers, collection development and acquisitions departments, out-of-print dealers, reference resources, scholarly articles discussing electronic information issues related to acquisitions and collection development, and even library humor.

**T-POT—Technical Processing Online Tools** ([http://tpot.ucsd.edu](http://tpot.ucsd.edu)). This Web site was built by Technical Services staff at the University of California at San Diego. Its primary focus is acquisitions, serials, and cataloging, but it includes some links to sites for collection development. T-POT includes a section, titled Top 200 Technical Services Benefits of Home Page Development ([http://tpot.ucsd.edu/Cataloging/Misc/top200.html](http://tpot.ucsd.edu/Cataloging/Misc/top200.html)), with more than 700 broadly categorized links to other sites ranging from HTML basics to electronic journals in library and information science, to a cliché finder.

**The Internet Library for Librarians** ([www.itcompany.com/inforetreiver/index.htm](http://www.itcompany.com/inforetreiver/index.htm)). This Web site is produced at Infoworks Technology Co. by a staff of librarians and MLS students. More than 2,000 sites covering all branches of librarianship are included. The site offers a section, titled Acquisitions/Serials/Collection Development, which includes information on the acquisition of foreign materials, licensing of electronic products, publishers’ catalogs, and general resources.

**Tools for Selecting Web Resources**

Selecting Web resources often involves a different process than does selecting print materials. When selecting print materials, librarians identify gaps in collections or learn of new programs or areas of research that need support, and continue to develop collections for ongoing programs. With this in mind, they review the standard sources, e.g., *CHOICE* and *Books in Print*, which allow them to learn about new publications and resources that meet the identified information needs.

While this might be possible in some cases with Web resources, as some standard sources are expanding their scope to include Web-based resources, the process often becomes the proverbial fishing trip casting a net broadly to see what comes in, then sorting to select only those resources that will support some aspect of teaching and research at the institution. Internet search engines or any of the tools described below will help selectors cast the net.

**Bioux (1997)** likened the process to hunting and gathering wild fruit in a jungle rather than harvesting the cultivated crop of print materials. Despite the ad hoc process, Web resources do get selected, usually to supplement the print collections, but in the future we will see Web resources selected as integral parts of the collection. The Web collection thus created can be organized into a set of Web pages, or cataloged with a direct link leading from the bibliographic
record in the library catalog to the resource itself. The collection can include links to large metasites as well as to specific sites or portions of sites.

Any of the numerous Web search engines available—Yahoo!, AltaVista, or HotBot, for example—can be used to locate and identify sites to add to a Web resources collection. As with the search for bibliographers’ tools, however, the search for Web resources is made easier by metasites that organize and categorize useful Web sites on many topics. Sites that rate or evaluate Web resources can be especially helpful. Following are some examples.

**The Internet Scout Project** (http://scout.cs.wisc.edu/scout). This site is produced at the University of Wisconsin at Madison and is funded by the National Science Foundation. Begun in 1993, it is the oldest Web resource selection tool (Calcari 1997). It lists the best scholarly Internet resources and a brief review of each, provided by librarians and subject experts. It primarily covers the areas of business and economics, science and engineering, and the social sciences. It includes background information for the novice, evaluative descriptions of search engines and subject related sites, and a “Kids Report” of sites designed for children. The site also includes an electronic mailing list that announces new sites every two weeks.

**BUBL-LINK** (http://bubl.ac.uk). This site is produced by librarians at Strathclyde University in Glasgow, Scotland, and is funded by the United Kingdom’s Joint Information Systems Committee. It contains more than 10,000 Internet resources in all disciplines, which have been evaluated and are accompanied by brief descriptive annotations. It is international in scope, cataloged according to the Dewey Decimal Classification system, and both browseable and searchable.

**The ARGUS Clearinghouse for Subject Oriented Internet Resource Guides** (www.clearinghouse.net). Librarians and MLS students working with staff at Argus Associates produce this site. They have compiled Internet-accessible topical guides that link to other Internet information resources for students, researchers, and educators. Sites listed in the guides are evaluated on several criteria (such as resource content and design) using a five-point rating system; in addition, each site is given an overall rating. Guides are reviewed annually and are both browseable and searchable.

**Conclusion**

Materials selection is often performed by a variety of people in any given library, each of whom may or may not have collection development as a major responsibility. By designing a Web page, collection development librarians can create a convenient means to harness Web technology for their own use. As libraries become more fully wired and librarians rely more on electronic communication, the 24-hour accessibility of the Web makes it a logical solution for providing information to all selectors, even if they work in different locations.

As we have seen, many resources on the World Wide Web can enhance a selector’s ability to work effectively. Ready online access to such resources as Books in Print, vendor databases, or a currency converter can prevent trips to the reference desk and photocopier. Other aspects of our jobs have been revolutionized by the Web; for example, searching for out-of-print materials, a task that once took years and was sometimes impossible, has now become simple and routine using Web-based search engines designed for this purpose (Hamilton 1999). We believe that organizing links to useful Web resources frequently used by a library’s staff is worth the effort.

The Web itself has become a new arena in which to practice our trade of selecting, but it can be a time-consuming business to hunt down individual Web sites that might be useful. Many excellent Web sites maintained by librarians include evaluations and subject-oriented collections of Web resources. These review sites can aid in discovering Web resources that would make valuable supplements to academic library collections. By gathering links to review sites into one place, collection development librarians can easily remember and make use of them.

Web-based bibliographers’ tools for selecting print and Web resources offer convenience and efficiency. A thoughtfully designed Web site will allow collection development librarians to bring together resources in the way that is most effective for each individual institution and build their own custom-made toolkit for selectors.

**Works Cited**


Organizing Academic Libraries for Collection Development. Academic Library Association of Ohio Collection Management Interest Group 1999 Spring Workshop, May 13 at Ohio State University, Columbus, Ohio.


Book Reviews

Margaret Rohdy, Editor

Introduction to Managing Digital Assets: Options for Cultural and Educational Organizations.


This book will be news to those of us focusing on alternative models of scholarly communication. We have often emphasized the need to address intellectual property restraints and have urged campus authors to keep copyright on campus so that its benefits are under academic control. But what happens when the library or the museum decides to exploit its intellectual property by selling or licensing its texts and images?

This well-written book, the last gasp of the Getty Information Institute (which closed in 1999), is a how-to manual for museums and libraries that wish to make money from their intellectual resources. Zorich is frank in favor of doing so and successfully guides directors through the thicket of rights management so that they may "move toward a more businesslike model that capitalizes on the growing market for online uses"(34). This is not an unreasonable goal, and a Getty publication focusing on money and institutional rights is not surprising. However, Zorich focuses wholly on institutional needs with little reference to user needs and rights. There is no differentiation of uses, for example, between entertainment, lifelong learning, teaching, or scholarship. Such a discussion could have noted the consequent different financial and cultural stances a museum might take in marketing its resources. The author says, "Perhaps the most threatening aspect of electronic networks is their potential for making the copying of intellectual property easier, cheaper, and faster"(23). Network users don't feel this way. A more balanced discussion would take into account the enormous opportunities for learning and empowerment that the network makes possible, and the identification of the museum's responsibility in such an environment.

The book's brief discussion of copyright fair use provisions assumes a stance above the current fray, noting, "Those who believe that access to intellectual property will occur solely through licensing and similar schemes feel that fair use is unnecessary"(20). This presentation ignores the very real conflict between publisher and user interests. Zorich takes no note of the ongoing massive efforts by intellectual property holders to change copyright law in their favor. Should cultural heritage institutions hoping to exploit their resources support these moves, or, on behalf of their users, oppose them? The author could reasonably have commented, but did not. More worrying, because it is incorrect, is her stance that the definition of fair use is a matter for the rights-holder to "accord" or not (67).

But the book succeeds very well on its own terms. Its major focus is on how cultural heritage organizations can effectively manage the exploitation of their intellectual property resources. Most such organizations—typically, but not only, museums and libraries—have had long experience in giving permissions for use, often in exchange for nominal fees and marginal cost-recovery and for the minor publicity that citation brings. This model probably never significantly contributed income or fully recovered costs. Now the opportunities for income have been made evident, if nothing else by the money made by others from museum contents: the Chicago Historical Society is still stewing about the money it didn't make for what it allowed Ken Burns to use in his PBS Civil War series. Trustees have not been slow to press museums on this point, and entrepreneurial directors have led the way.

Zorich makes clear that handling the odd rights transaction in-house won't work any more. There are other alternatives, primarily outsourcing to external agencies or joining a rights-holder collective or consortium. External agencies, such as ASCAP (American Society of Composers, Authors, and Publishers), the oldest rights management organization in the United States, are efficient but often focused on their own goals. Collectives, cooperatives, or consortia allow like-minded institutions to pool resources in marketing more or less similar intellectual properties and in efficiently monitoring their use and collecting their income. There are chapters on each of these subjects, with brief history where appropriate, pros and cons, and useful references, followed by the chapters "Managing Content and Usage" and "Rights-holder and User Issues." "Economic Considerations" is devoted to the elements of cost and revenue, with some discussion of fee collection and redistribution.

Zorich distinguishes "small rights" and "grand rights." Our institutions are not typically concerned with "grand rights," which might cover a Broadway musical. "Small rights" are
those associated with a large number of intellectual resources, each of which may be used occasionally, such as music replayed on radio or an image used in a textbook. Such small rights need to be handled collectively if they are to be handled efficiently. Zorich also makes clear that she is talking about a wide variety of intellectual resources, providing a useful summary of intellectual management traditions by genre, including literary works, music, dance, software, graphics and fonts, and visual images. The book is focused on the situation in the United States, but there is a separate chapter on the Canadian environment that has value for institutions there.

Museum and library directors will need to refer to this book if they are beginners at marketing their intellectual properties. Librarians in general can benefit from reading it to be made aware that copyright does not exist solely to provide fair use exemptions for our users. Though this book fails to bring out the balance of user's rights and owner's rights, it will be of real use to those focusing on the latter. It is attractively produced and has an excellent bibliography, though there is no index.—Peter Graham (psgraham@syrc.edu), Syracuse University Library, Syracuse, New York


When the Getty Information Institute announced its Museum Educational Site Licensing Project (MESL) in 1994, universities and museums paid attention. This well-funded, organized effort aimed to deliver digital images from museums into university courses. MESL was intended to address head-on the project-thwarting issues of intellectual property, cost-versus-benefit, and technology. These two volumes are the resulting official report. In simple terms, the first (Delivering Digital Images) is a discussion of how, and the second (Images Online), of why. The story is well told, and these reports are worthwhile skimming for anyone considering a digital imaging project. They provide valuable insights from the perspectives of university and museum educators, visual resources professionals, programmers, network administrators, and project managers. Perhaps most relevant in the current, complicated legal environment are the contributions of intellectual property lawyers.

The even tone of the report reflects the spirit of the MESL project, emphasizing communication and consensus between institutional cultures. By articulating issues, the report has the potential to open communication between the sometimes-conflicting interests of museums and universities. These insights can help to inform future undertakings such as the Art Museum Image Consortium (AMICO), the National Digital Library Program (NDLP) of the Library of Congress, and the Museum Digital Licensing Collective (MDLC), as well as numerous purely commercial projects underway. The cooperative agreements and usage guidelines could also help resolve conflicting interests of publishers and consumers in the broader debates over intellectual property law.

This problem-solving approach is the most refreshing aspect of the MESL reports. The project was made to work where many others are thwarted by intellectual property or technical problems. Or almost made to work—one unmet goal is a model site-licensing document. In its place is the chapter "Establishing Terms and Conditions for Educational Institutional Licensing of Museum Images: A Framework for Museums and Universities." Though general, this framework is a guide for similar endeavors. Particularly interesting are the glosses emphasizing the perspectives of the two groups. For example, on the general topic of licensing: "Museums want to work with ... 'educational' organizations in the broad sense, e.g., schools (K-12), libraries, other museums, and colleges and universities" while "Universities want a license agreement tailored to the specific needs of institutions of higher education" (Delivering Digital Images, 23). Or this stickler issue: "Museums want to control images and information about their artwork and collections" while "Universities prefer to have the least restrictive terms ... enabling a full range of traditional and nontraditional educational uses" (Delivering Digital Images, 23). This volume includes user surveys and a cooperative agreement, which can also be used as models.

On the technical side are four chapters in Delivering Digital Images presented concisely and just generally enough to keep from being immediately outdated. These chapters address metadata and data export, digital image production, distribution, and local implementation. The authors are forthcoming in discussion of problems encountered and how—or if—they were resolved. As they were integral to the project, technical issues aren't restricted to this section. Rather, we see their impact throughout from the various perspectives of instructors, network administrators, and legal advisors.

Reading more broadly in Images Online, we learn about interesting unintended consequences of the MESL project. Specifically, we see
how the perceived value of the undertaking changed as the project moved along. Zorich illustrates this point in the chapter “Musings on the Museum Educational Site Licensing Project” by describing how, as costs began to outweigh benefits, museum interest in the project shifted from revenue generation to outreach. A secondary effect observed by several writers is participants’ changed views of their jobs, their roles, and the ways they communicate within their institutions.

In the MESL Project, the predominant use of images was in art history classes; however, the act of viewing, such a self-conscious—and fraught—aspect of art scholarship, is not directly addressed. The educators’ reports include some insights, but most are anecdotes; there are few references to theory or criticism. An interesting follow-up project to MESL would be distribution of images to courses in other disciplines concerned with the analysis of images, such as nonart history courses, graphic design, and cultural and media studies courses.

In sum, these two books are a reminder to those considering a digital imaging project to pay attention to data standards, be prepared to work closely with many other kinds of professionals, and have money and time. One is also reminded to reflect upon the effort, as NDLP legal advisor Melissa Smith Levine does when she asks if “historical changes that stemmed from technological innovation were always accompanied by such a conscious effort to predict the path of societal impact and to shape it.” (Images Online, 73).—Jenny Tobias (jennifer_tobias@moma.org), Museum of Modern Art Library, New York.


Few libraries have the luxury of trained staff dedicated specifically to the task of book repair. Most often this task is one of many assigned to technical services staff or handed off to volunteers. Training may be too distant or too expensive; staff are left to make up repairs on the fly—or attempt to learn techniques from a manual.

Abraham Schechter’s *Basic Book Repair Methods* slips into a niche surrounded by manuals (Greenfield 1983; Kyle 1983; Morrow and Dial 1986; Lavender and Stockton 1992) that are becoming dated or out-of-print, are designed for the home hobbyist, or address repair as part of a preservation program for manuscript, rare, or special materials (Ritzenthaler 1993; Ogden 1996). Schechter states at the outset that his intended scope is limited to “general, nonvaluable materials” (vii). If time and resources are available, these repairs are equally appropriate in public, school, special, and research libraries.

**Basic Book Repair Methods** is a sparse little book dedicated purely and simply to describing eight book repair techniques: cleaning paper, mending paper, book hinge tightening, repairing interior hinges, hinging-in pages, case and textblock attachment, cloth rebacking, and retitling. There is no discussion about setting up a work area, developing a repair program, or making decisions for book repair. Basic bench techniques, such as finding the grain direction of paper, cutting with a knife and straightedge, or handling a glue brush, are described, if at all, cryptically and in passing. The glossary is short, idiosyncratic, and apparently assembled without reference to standards for the field or for composing definitions. A list of suppliers, bibliography, and index supplement the text.

The range of techniques presented is appropriately selected to be both useful as solutions to common problems and within the scope of staff with beginning-to-intermediate skills and limited facilities and equipment. The text is brief; each section includes a paragraph or two of introduction, a list of materials, a step-by-step narration of each repair, and occasionally a concluding comment. The instructions are usually adequate, in spite of the author’s tendency to stretch words to fit his own meanings and to use slightly unconventional general, rather than technical, terms.

The manual’s strongest feature by far, however, is its photographs. Since the author himself is the photographer, he has been able to compose and select his photographs to illustrate his point exactly: text and photo intertwine, each providing information that would be incomplete without the other. Unlike photos in other typical manuals, these are snapped from the operator’s viewpoint, as if the author were working with a camera strapped to his forehead. It is unfortunate that in the reproduction some of the photos lose definition—a white endsheet fades into a white textblock—and become difficult to read. At their best the pictures are indeed worth a thousand words.

Some inaccuracies and misinformation have slipped into print. PVA adhesive, for example, is described as “Polyvinyl Acetate glue, which is manufactured to archival standards” (21). There are no such standards, and there are many varieties and qualities of PVA available. In the instructions “It is critical that the measurement of the width of the spine [inlay] be made against the width of the textblock, and the measurement of the length of the textblock be made against the boards of the case” (57), the second “textblock” should be “spine inlay”—a critical slip in describing this construction. Schechter misuses technical terms in describing chemical and physical properties of materials, using vague, common terms such as “acid-free” as if they have a specific technical definition.

With *Basic Book Repair Methods* in hand, can one learn to repair books without outside assistance? If endowed with reasonable manual dexterity,
patience, and willingness to “practice with expendable, non-collection materials” (vii), a beginner will find sufficient information to get started. But the sixteen blank pages for “Reader’s Notes” at the end of the book are a tacit assumption that much of the learning process will be and should be enriched through practice and contact with experienced book repair specialists. However, I am left wishing that someone knowledgeable in both editing and in book repair had taken a firm hand early in the preparation of this book, while respecting Schecter’s clear visual comprehension and commitment to simplicity. There is a need for this type of manual, but Basic Book Repair Methods is not that book.—Shannon Zachary (szachary@umich.edu) The University of Michigan Library, Ann Arbor.

Works Cited

Instructions for Authors

Manuscript Submission

Manuscripts of articles should be sent to the editor, Jennifer Younger, University of Notre Dame, 221 Hesburgh Library, Notre Dame, IN 46556; (219) 631-7790; fax: (219) 631-6772; e-mail: Jennifer.A.Younger.1@nd.edu.

In general, the editorial staff follows the Guidelines for Authors, Editors, and Publishers of Literature in the Library and Information Field adopted by the American Library Association Council in 1983 and available from the ALA Executive Offices. Information about copyright policies also is available from ALA headquarters.

Manuscript Preparation

Please follow these procedures for preparing manuscripts for Library Resources & Technical Services (LRTS):

1. Submit original, unpublished manuscripts only. Do not submit manuscripts that are being considered for publication in other venues. Authors are responsible for the accuracy of statements included. Papers presented at a conference should be identified with the conference name and date in the cover letter.
2. Manuscripts may be submitted on paper (three copies, machine-printed and double-spaced) or in an electronic form (Word file attached to e-mail). Disk copy will be requested from authors for accepted articles.
3. Write the article in a grammatically correct, simple, readable style. Whenever possible avoid jargon, anthropomorphism, and acronyms. All acronyms must be accompanied by their full spelled-out form. For spelling and usage consult the Random House Webster's College Dictionary (New York: Random House, 1991). Verify the spelling and accuracy of all names in an appropriate source. Consult The Chicago Manual of Style 14th ed. (Chicago: Univ. of Chicago Pr., 1993) for capitalization, abbreviations, usage of numbers, etc.
4. Give the article a brief title; if the title does not fully describe the content of the article, add a brief subtitle. On the first page of the manuscript give the article title, the name(s) of the author(s), and the position title, institutional affiliation, and address of each author.
5. On the second page of the manuscript give the title followed by a brief, informative abstract. Do not identify the author(s) here or elsewhere in the manuscript. Number all pages throughout the manuscript.
6. Submit all references on separate pages at the end of the text, preceding any tables or illustrations.
7. LRTS follows The Chicago Manual of Style author-date system of references (see chapter 16). Verify each citation by sight, very carefully.
8. Follow the examples and suggestions in chapter 12 of The Chicago Manual of Style in designing tables. Submit each table on a separate page at the end of the manuscript. Indicate the preferred placement in the text with an instruction in square brackets. Provide each table with a brief, meaningful caption.
9. Be prepared to supply camera-ready copy for all illustrations. Accompany the manuscript with a photocopy of each and a brief, meaningful caption noted on the verso.

Editorial Policy

Library Resources & Technical Services (LRTS) is the official journal of the Association for Library Collections & Technical Services (ALCTS), a division of the American Library Association. The following statement of editorial policy was adopted by the ALCTS Board of Directors, April 1998.

Purpose

The purpose of LRTS is to support the theoretical, intellectual, practical, and scholarly aspects of the profession of collection management and development, acquisitions, cataloging and classification, preservation and reformatting, and serials, by publishing articles (subject to double-blind peer review) and book reviews, and editorials and correspondence in response to the same.

Audience

The audience for LRTS includes practitioners, students, researchers, and other scholars with an interest in collection development and technical services and related activities in all types of libraries.

Frequency

LRTS is published quarterly, with the volume calendar corresponding to the
calendar year. Numbers appear in January, April, July, and October.

Scope

The editor of LRTS, with the assistance of an editorial board, strives to achieve a balance among the articles published in the journal so that the interests of each of the sections of ALCTS (Acquisitions, Cataloging and Classification, Collection Management and Development, Preservation and Reformatting, Serials) is represented in the journal. Articles on technology, management, and education, e.g., are appropriate to the journal when the application of these is to issues of interest to practitioners and researchers working in collection development and technical services. The scope of the articles published in LRTS is also guided by the Mission and Priorities Statement adopted by the ALCTS Board of Directors in 1990.

Content

The content of LRTS is to include:

1. Articles that further the advancement of knowledge by reporting the results of research or other scholarly activity

2. Periodic literature review essays that discuss issues and trends

3. Notes that report unique or evolving technical processes

4. Notes that report unique or evolving research methods

5. Substantive book reviews of new publications

6. A brief, factual, annual statement of the association’s accomplishments

LRTS is not an appropriate forum for brief reports on new products, new services, or other current news items.

---

Reviewer’s 1999

These reviewers are those to whom manuscripts received in 1999 were sent. Compiled February 8, 2000.

Ames, Charlotte
Avery, Christine
Barker, Joe
Bloss, Marjorie
Bogan, Ruth
Boissonnas, Christian
Budd, John
Callhoun, John
Cherubini, Timothy
Conway, Paul
Cook, Eleanor
Crammer, Beth
Dannelly, Gay
Dietl, Sue
Dirks, Lee
Drewes, Jeanne
Duke, John
Dykeman, Amy
Eden, Brad
El-Sherbini, Magda
Ercelawn, Ann

Frost, Gary
Geer, Beverley
Gertz, Janet
Gilbert, Virginia
Gleason, Maureen
Goodwin, Vania
Haar, John
Hixson, Carol
Jackson, Mary
Johns, Cecily
Johnston, B.J.
Jones, Richard
Koh, Gertrude
Kreider, Janice
Kusmer, Rob
Leighton, Lee
MacEwan, Bonnie
Martin, Sylvia
McCandless, Patricia
Miksa, Fran
Monson, Mary

O’Brien, David
Olley, Lorraine
Padway, Janet
Buschoff, Carlen
Sellberg, Roxanne
Sercan, Cecilia
Sinclair, Regina
Stavri, Zoe
De Stefano, Paula
Stevenson, Donna
Szambelan, Carol
Taylor, Arlene
Treadwell, Jane
Thoby, Judy
VanJacob, Scott
Vellucci, Sherry
Watson, Ann
Winters, Barbara
Yontz, Elaine
Sponsors 1999

ALCTS thanks its corporate sponsors for the generous support of our programs, conferences, and awards during the past year!

Sustaining Program Sponsors
Sponsorships of more than $2,500 annually over three consecutive years

OCLC Online Computer Library Center, Inc.
Yankee Book Peddler, Inc.

Sustaining Key Contributors
Sponsorships of more than $750 annually over three consecutive years

Academic Book Center, Inc.
Blackwell's Book Services
Harrassowitz
R. R. Bowker
John Wiley & Sons, Inc.

Program Sponsors
Sponsorship in FY1999 of $5,000 and more

EBSCO Industries, Inc.

Key Contributors
Sponsorship in FY1999 of $1,000 to $4,999

Acme Bookbinding
Association of American Publishers, Inc.
Brodart Co.
The Gale Group
Kater-Crafts Bookbinders
Library Binding Institute
Library Binding Service
netLibrary

Contributors
Sponsorship in FY1999 up to $999

Academic Press
Baker & Taylor Books
CARL/UnCover
Ingram Library Services
Midwest Library Service
Swets & Zeitlinger, Inc.