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School Library Media Centers and Networks

Phyllis J. Van Orden and Adeline W. Wilkes

This descriptive, exploratory study of building-level school library media centers belonging to at least one multistate, multitype library network was designed to investigate the impact of networks on collections and technical services. A questionnaire was used to survey school library media specialists' insights into the benefits and barriers of networks; the implications of networking on cataloging, classification, and processing practices; interlibrary loan patterns; resource sharing; and responsiveness of teachers and students to networking.

The concepts of formal networking and resource sharing are not new ideas for school library media programs (Task Force on the Role of the School Library Media Program in the National Program 1978, 34; American Association of School Librarians and others 1975). A recent endorsement of the concepts is found in the 1988 publication, Information power: Guidelines for school library media programs (American Association of School Librarians 1988), which recommends the provision of access to resources outside the media center and the school building through use of interlibrary loan, networking, and online searching of databases. A network, as used in this study, is a formal arrangement in which a group of individuals or organizations, interconnected through a communication mechanism, forms a system to accomplish a specified goal.

During the 1980s a number of dissertations about networking and school library media programs appeared. Examples include Catherine Murphy's study of online public access catalogs (1987); Barbara Immroth's on the role of school-level programs in the Colorado Regional Service System (1980); H. Thomas Walker's documentation of the use of interlibrary loan by administrators, teachers, and students (1982); and Ann Carlson Weeks' study of school library media specialists' attitudes concerning library networking and technology (1992). The dissertations, except for Murphy's, reported research that focused on a specific state or school district.

Networking was featured in three presentations at the Treasure Mountain Research Retreat sponsored by the Research Committee of the American Association of School Librarians (Woolf 1990). In reviewing the research literature about cataloging, collections, and networks, Murphy (1990), Callison (1990), and Immroth...
(1990) agree that information on the impact of networking on building-level media programs across the country is not readily available.

Another body of literature has described the operations and impact of networking within specific systems. One of the most widely discussed programs is Access Pennsylvania, which has served as a model for other states (Epler and Tuzinski 1991; Epler 1988; Pennsylvania Online 1985; and Epler and Cassel 1987).

The impact of networking on cataloging, classification, and processing practices; interlibrary loan patterns; and resource sharing for district-level media programs was investigated by the authors (Van Orden and Wilkes 1989). Respondents from forty-nine school districts identified the benefits they were receiving and offered advice for those considering such participation.

THE STUDY

The purpose of this exploratory, descriptive follow-up study was to gain insight about the experiences of building-level media specialists in the school districts participating in the earlier study. District-level respondents from the previous study were asked to provide names of full-time school library media specialists at the building level in their district. Thirty-six of forty district-level personnel responded; of these 36, one did not have a list of personnel available and another called to report that only the district media center participated in networking. The 34 districts represented in the study range in size from a single school to more than 200 schools.

Significant problems occurred with the identification of full-time media specialists serving only one school. The district-level personnel identified 754 individuals. The address information provided did not include level of school, full-time status, or network affiliation. Thus, it was impossible to draw a representative sample from the names provided, so all persons named on the list were surveyed.

The investigation followed the design recommended by Dillman (1978). The initial mailing, which included a cover letter and the questionnaire, was sent to the 754 individuals identified by the district-level personnel. During the mailing process the researchers discovered 175 individuals listed for more than one school, and these individuals were eliminated from the study. An interim reminder letter and a third mailing of a cover letter and questionnaire were sent to the people who had not responded prior to December 1, 1990.

Of the 579 individuals assumed to be full-time building-level school library media personnel, 361 individuals responded, resulting in a response rate of 62.3 percent. In these responses the researchers identified 108 additional ineligible individuals, who held part-time or non-building-level positions. These responses were omitted from the study, leaving 253 eligible responses. In these responses, 94 respondents indicated that their schools did not participate in networking activities, which resulted in 159 responses from individuals with networking activities in schools at the building level. This group formed the basis for the study.

CHARACTERISTICS OF THE RESPONDENTS

Responses from the study reveal that across the country, in rural, suburban, and urban settings, school library media specialists are providing access to resources through the use of networking and interlibrary loans. Networks accessed by these schools include:

- Access Pennsylvania
- AMIGOS
- Bibliographic Center for Research (BCR)
- Bibliographic Retrieval Services (BRS)
- Online Computer Library Center, Inc. (OCLC)
- Illinois Library and Information Network (ILLINET)
- Indiana Cooperative Library Services Network (INCOLSA)
- Michigan Library Consortium (MLC)
- Western Library Network (WLN)

Some of the state networks listed provide access to multistate, multitype networks. A number of the respondents also participate in district-wide, multicounty,
and local networks. The local networks include a variety of arrangements: only schools within the district (33); district schools and local public libraries (20); only schools within an intermediate district (13); district schools, local public, and academic libraries (11); district schools, local private schools, and local public and academic libraries (11); district schools, local private schools, and local public libraries (4); and district schools and local private schools (2).

Of the respondents, 63 are school library media specialists for elementary schools, 38 for middle schools or junior high schools, 52 for high schools, and 6 for schools serving specialized students or all grades. The schools range in size from 5 serving more than 2,000 students each to 6 schools serving 1 to 249 students. The others include 48 serving 250–499, 67 schools serving 500–999, 25 serving 1,000–1,499, and 8 serving 1,500–1,999 students. The majority of the schools have only one certified school library media specialist; this includes one high school serving more than 3,000 students. States represented in the responses include Alaska, California, Colorado, Illinois, Indiana, Massachusetts, Michigan, New York, Ohio, Oregon, Pennsylvania, and Texas.

A variety of services and operations were reported as being offered at the school district level for the building-level school library media specialist. Personnel representing different levels of schools (elementary, middle, and high school) from the same district did not report receiving the same services. Centralized processing, including cataloging, was available for 93 of the 159 respondents, while 26 received processing without cataloging. Budget preparation and monitoring was a centralized operation for 93 of the 159 building personnel. Fifty-two schools of the 159 reported centralized resource sharing efforts, including coordinated collection development. Acquisition was a centralized service for 82 building-level programs. Other centralized services included examination centers and previewing arrangements (73), collection maintenance and repair (34), exchange centers (28), opening and closing collections (43), and selection (22).

The schools were represented in the external networks by the district media supervisor (24), librarians representing the district (21), administrators representing the district (8), one representative per building (8), the respondent (6), board members (2), principals (2), superintendents (2), a high school media specialist (1), a computer chair (1), and a coordinator of an instructional materials center (1). One respondent reported that the district librarian position was eliminated in 1990, leading to the withdrawal of representation and participation in the network. Eight respondents had no representation, and 75 failed to answer the question.

Thirty-eight of the schools had an operations manual, which is used by media center staff (33), teachers (8), students (2), the principal (1), school staff (1), and central cataloging staff (1). Thirty-four schools had an instructional manual on how to use their network. These manuals were used by media staff (34), teachers (12), students (10), and clerical staff (1). Eight schools had profiles for the network operations.

Some of the schools used CD-ROM and online bibliographic services. Fifteen schools had access to BRS and DIALOG, eight used jobber/vendor programs, four had Books in Print Plus, and two each used Wilsonline and Wilsondisc. None had Ulrich's Plus. Other online and CD-ROM resources available in the schools included Magazine Article Summaries (6), Grolier's Electronic Encyclopedia (6), Information Plus (World Book) (2), Compton's Multimedia Encyclopedia (2), Academic American Encyclopedia (2), News Bank Index (2), Oxford English Dictionary (9), ERIC (Silver Platter) (1), Grolier's World Atlas (1), and Magazine Index (1).

**Network Benefits**

Network products are one form of benefits. The respondents took advantage of the network newsletters (48), directories (37), training packages (15), and guidelines for copyright (15). Other network services used by the schools included staff development and in-service programs (45), technical assistance (31), consultation services (28), public relations services (16),
database management assistance (14), curriculum planning for teaching online searching (11), cataloging manuals (1), union lists of serials (1), and curriculum guides (1).

Greater access to resources was cited as a chief benefit of networking by many of the respondents. As one wrote:

I can now get quicker, better, and often more appropriate access to materials for my students. The collections of 586 libraries are now a keyboard away.

Another media specialist wrote of the benefit of having IBM-XT terminals and CD-ROM drives in the center, as well as of having time allotted to meet with other librarians.

Networking increased the opportunity to communicate with other media specialists; to meet with others to exchange ideas was a significant factor for a number of respondents who expressed feelings of now being less isolated from their colleagues. Others wrote about the benefits of students being able to interact with a computerized system to prepare them for the future.

Networking also provided opportunities for joint purchase of materials. Schools jointly purchased equipment (23), audiovisual materials and supplies (25), serials (periodicals and newspapers) (10), and books (7). Thirty of the media centers belonging to networks had access to examination centers and previewing arrangements.

Respondents were involved in resource sharing. Eight respondents were involved in coordination of collection development efforts and seven in coordination of materials selection. Thirty-nine had access to online databases, and 62 participated in cooperative film/video libraries. Individual school media centers had been assigned responsibility for collecting specific types of materials. Collection development responsibilities for audiovisual materials included 6 for video formats (including disc), 4 for films, 2 for filmstrips, and 1 for study prints. Primary collecting responsibility had been assigned for career education materials (8), professional materials (8), instructional equipment (7), ethnic materials (6), high interest/low vocabulary materials (4), children's materials (4), young adult materials (4), and materials for students with special needs (4). Others had primary responsibility for laminating facilities and for collecting magazines and business materials.

One hundred and twenty respondents worked at schools that participated in interlibrary loan arrangements. Only one respondent had faced cutbacks in borrowing and lending practices during the last year. Eighty-five of these schools used manual systems, 30 used online systems, and 5 failed to answer the question. Books were borrowed by 116 schools; lent by 104. Audiovisual materials were borrowed by 75; lent by 64. Serials were borrowed by 61 schools; lent by 55. Three of the schools borrowed and lent photocopies of articles.

The four types of borrowing practices used by the schools included borrowing from other schools in the district (106), from nonschool libraries (65), from members of the network (65), and from schools in other districts (43). Borrowing privileges had been extended to other schools in the district by 102 schools, to schools in other districts by 58, to members of the network by 55, and to nonschool libraries by 43. Borrowing privileges had been extended to teachers (117), to high school students (71), to middle school and junior high school students (50), to elementary school students (50), to administrators (86), to parents (24), to school board members (18), and to other community members (11).

Delivery systems for interlibrary loan (ILL) materials varied, with some schools using more than one method. One hundred and two respondents used school system couriers, 32 used the post office, 25 multitype library couriers, 16 United Parcel Service, 12 telefacsimile, 1 satellite, 1 cable, and 1 "me and my car."

Fifty-one schools participated in formalized ILL procedures through networks, 34 in formalized ILL procedures within their district, 20 in formalized ILL procedures through the state library, and 12 only through reciprocal borrowing agreements. Ninety-two charged no fees, 3 charged by the item, 5 for postage, and 1 for journal articles exceeding 10 pages.
RESPONSIVENESS OF USERS

The school library media specialists participating in the study shared the following perceptions about the responsiveness of users to networking:

1. Initially teachers might be slow in accepting networks and automation, but as they learn about the resource possibilities they become responsive and enthusiastic and eventually develop higher expectations of services.
2. Elementary school teachers involved in whole language programs benefited from interlibrary loans, but as one respondent wrote, "The ones who use it love it. Until the others comprehend what it can do for them, they will not use it." One media specialist reported that the teachers were very positive, but "felt neglected when the media center staff was so involved in the automation process." Another faced the question, "Why does automation take so long?" For many teachers enthusiasm began only when they first received needed materials through ILL.

Students were responsive, enthusiastic, and excited. One librarian wrote, "They are grateful that they can avail themselves of the entire library collections of many schools." Another respondent reported "fantastic use, they print out their bibliography using the business department's printers then bring it to the library to check out materials." According to one media specialist, "Students generally approach the computer with more eagerness than they evidence after doing a print search."

In one high school this response was particularly strong among the boys. "Special needs students doing science projects have been grateful," wrote one respondent, but this "requires staff to work extra hours to develop the service." Students of all ages responded positively, and older ones wanted to learn how to search BRS.

Can schools keep up with this interest?

Some are already recognizing the limited number of stations they have available, especially when all members of a class are being served at one time.

NETWORKING BARRIERS

Commonly cited barriers included psychological barriers (i.e., attitudes), political and legal barriers, funding, communication, and planning. Additional barriers for building-level personnel were lack of leadership at the district level, lack of personnel at the building level, and rigid scheduling. (One elementary school media specialist had thirty classes per week.)

Other barriers were related to technology and lack of standardization. One respondent wrote:

"Our district is working on a technology update and is designing software for multischool use in preparation for networking . . . . Of the six high schools, only three have the same software and only two have similar hardware.

The problem of standardization is addressed in the following remarks:

Wouldn't it be wonderful to find some standardization in the area of automation and networking? Anywhere in the computer industry? It is particularly frustrating to think that you have asked all the right questions, gotten all the right answers, are ready to set a project in motion only to find that some component is incompatible. It is also frustrating that many of us, particularly in smaller districts, have to re-invent the retrospective conversion wheel at a great deal of expense to the district. There are so many common factors from one high school library to the next, why are we not sharing our knowledge and collection information free of charge or for a minimal charge? Why are we all paying for a MARC record for our Encyclopaedia Britannica? School libraries are getting less and less of the education dollar, so it becomes more and more important that we find ways to share collections and resources.

Space and facilities can also create barriers in crowded schools where classes are taking over library space or where the "reading room is too small to
absorb the noise accompanying terminals and printers.”

Three respondents encountered restrictions in the range of their collections, while one reported having free exercise of professional judgment inhibited. Eight found staff commitment to be a problem, six ran into problems with a lack of understanding of the concept of networking, and two were in schools that were unwilling to share resources.

The attitudes of the respondents ranged from very enthusiastic to that of the individual who wrote, “I do not participate. I don’t feel the need.” This is in contrast to another high school media specialist from the same district who stated:

Because of a state grant, we have not had to absorb any of the costs associated with networking. Therefore, we have had many benefits associated with being part of the state grant including computer hardware and software. It has enhanced the image of our meager high school library, located in a nearly bankrupt city.

A different concern was expressed by the respondent who remarked:

Networking would be useful, but most librarians in our district would be extremely reluctant to lend materials to other schools due to the very reasonable fear that they would never re-appear!

This is in contrast to the new media specialist who wrote, “One thing I’ve learned very quickly is that interlibrary loan within the district is great!” Other media specialists spoke of networking as being a real asset to their school.

Regarding contractual matters, one respondent recommended, “Define exactly what is to be gained. Then seek help!” Another warned, “Get everything in writing, make sure the bid document is realistic. Do carry a maintenance agreement on all hardware and a technical service agreement on all software programs accessed through the in-house network.” Others advised, “Get someone who will deal with details if you won’t,” and “Use strong, tactful leadership.”

Twenty-two media specialists reported that lack of fiscal commitment created a barrier. Respondents addressed this barrier by seeking grants from their state legislature and other funding sources. One reported that it is “almost impossible to keep up technology-wise and we have been sacrificing by not buying books; the collection is suffering badly.” Others requested additional funding based on enrollment, used student volunteer services, and charged for photocopies and telefacsimile services. Funding for automation meant no new audiovisual equipment for another school.

Respondents commonly agreed that networking takes money and time. They offer the advice to “plan in stages over several budgets” and be prepared to “sacrifice other services and/or materials.” As one respondent wrote:

Help your immediate administrator to understand the benefits to students and staff. With his or her help and support, discuss your long term networking goals with the superintendent. Be willing to accept that the project might have to be done over a long period of time. Be patient and keep everyone posted on the progress.

Communication methods available in the schools include terminals (57), telephone (86), telefacsimile (12), satellite communication systems (8), and cable television (55). Telefacsimiles and satellite communication systems were more readily available at the district level. Thirty districts had telefacsimiles, 11 had satellite communications systems, 38 had terminals, 34 had telephones, and 24 had cable televisions. One media specialist wrote:

My library does not have a computer nor is there any money to purchase one in the future. I have an old fashioned library. I still stamp the books and book cards! We do not even have a telephone; I’m afraid that networking is an unreachable star.

Another communication problem occurs when building-level media specialists are not consulted about “decisions about district-wide things like networking” or the allocation of funding.

To address this problem, one county district regularly uses teleconferences as well as memos and workshops to keep the media specialists informed. Regional networks, such as BOCES in New York State, provide a variety of services and opportunities for media specialists to meet and to
serve on committees to update their knowledge and to share their needs.

Lack of staff commitment can be another barrier. One respondent warned, "Prepare to give your life to automation for several years." Or to word the advice another way:

Be willing to make automation and networking your top priority for a couple of years—set other goals aside. If it is necessary to recruit volunteers, be very choosy. Select "detail" personalities with good keyboarding skills.

Another advised, "Prepare the staff, for it is essential to have staff commitment and one must give sufficient lead time to raise the staff's comfort level." Other respondents noted as additional barriers the amount of staff time required on a regular basis to handle interlibrary loans, to keep records, and to train students and teachers in how to use the systems and how to conduct searches.

Lack of understanding about the concept of networking and lack of knowledge about the benefits of networking and its operations can also serve as barriers. Several respondents were not aware of the characteristics and benefits of networking. One consulted the school's principal who was also not knowledgeable about networking that exists within the system.

To create an understanding of the concept, one respondent suggested, "Education, Education, Education." Others recommended community meetings, information sharing sessions, publicity aimed at teachers, and workshops for teachers.

Leadership at the state and district level can help media specialists overcome all of these barriers. A tribute to one state media coordinator is evident in the following remarks:

Networking has brought more boys into the library environment and sparked a renewal of interest in an eighty-year-old building. Thank you, Dr. Epler, state media coordinator for Pennsylvania, for your foresight in reinvigorating a small Pennsylvania library. Thanks for upgrading a small high school library and allowing students to use computer applications beyond their computer literacy courses. The library is the one environment in a school where almost every student can feel comfortable using computers to fill and answer a real "need" that they have and integrate computers into the school environment.

The district school library media supervisor is a key figure for both leadership and communication. In one district, the loss of this position has deterred the development of networking plans for the district, which has network services available only at an inaccessible county office.

Individuals who took the initiative in a school's participation in an external network were identified as district media supervisors (59), the principal or other school administrator (18), the respondent (14), other school-level media staff (9), and a state school library media supervisor (1). The individual schools were represented in the governance of the external networks by the district media supervisors (12), librarians representing the district (8), respondents (6), administrators representing the district (3), board members (2), and superintendents (2). The success of networking experiences led one respondent to plan and develop a proposal to fund an information retrieval network within the school.

General suggestions for overcoming the barriers to networking included the following: "Have a strong desire and persevere," work with the district in establishing a long-range planning budget, and use communication to slowly remove the barrier.

**Implications for Cataloging and Classification**

Cataloging and processing were handled in a variety of ways. Thirty-three schools had online catalogs, 2 had COM (computer output microform), 2 had CD-ROM networks, 113 had card catalogs, 1 had a local in-house network, and 8 did not respond. In the 33 schools with online catalogs, the coverage varied: 20 schools had 100% of their books included, 9 schools had 75-99%, 3 schools had less than 50%, and 1 respondent did not answer the question. For audiovisual materials, 12 schools reported that 100% were in the online catalog; 4 schools had 75-99%, 11 reported
less than 50%, and 6 did not respond. Magazines are less frequently found in the online catalogs. One school reported 50–74% of its magazines were listed in the online catalog, 15 schools had less than 50% of their magazines listed, and 17 did not respond. Records were added to the online catalog in a variety of ways: by district-level staff (12), by building-level staff (9), by the online network (6), and by commercial agencies (2). Three schools used Bro-Dart; one used Baker and Taylor, and one used MICROLIF.

In the 113 schools where catalogs were not online, 100% of the books had been cataloged in 75 schools, and 75–99% of the books in 38 schools. Seventy-nine schools had 100% coverage of audiovisual materials in their non-online catalogs, 3 schools had 50–74% coverage, and 18 did not reply. The inclusion of magazines in the non-online catalogs appeared less frequently. Nine schools had 100% of their magazines listed, 4 schools had 75–99%, 3 schools had 50–74%, 70 schools had less than 50% coverage, and 27 did not reply. In these schools cataloging and classification were handled by building-level staff (43), by a commercial firm or firms (41), with cards ordered from the network (35), by the district-level services (25), and by the intermediate unit serving more than one school district (16).

Some schools used more than one method to catalog their materials. The commercial services included jobbers such as Baker and Taylor (13), Bro-Dart (3), and Follett (3). Card services being used included American Card Catalog Co. and Catalog Card Corp. Three schools used the OCLC bibliographic services. Schools also used the bibliographic services of publishers. Cards were produced using software programs (39), by typing each card (28), by using a memory typewriter (8), and by photocopied the master card (3). Software programs used by the respondents included Quick Card Printer, MacCard, Biblofile, Microsoft Word, Word/Spring Board, Catalog Card Assembler, Librarian's Helper, and Rachel's Catalog Card Printer.

Eighty-two school library media specialists checked the subject headings on acquired cards to be sure they agreed with the subject headings already in the catalog. Ninety-two checked the classification numbers on acquired cards to be sure they were compatible with existing class numbers.

Sears List of Subject Headings was the authority for 121 schools, Library of Congress Subject Headings for 16. Authority files were maintained for subjects by 43 schools; 34 had name authority files.

Nearly all of the schools cataloged their materials using the Dewey Decimal Classification; 79 used the abridged edition, and 61 used the unabridged. Two respondents used the Library of Congress Classification.

Bibliographic records were often customized by the district (49) and by the schools (53). Customization included truncated classification numbers (45), locally created subject headings (16), and specialized codings for special collections (1).

Anglo-American Cataloguing Rules, 2 ed., 1988 revision (AACR2R) was used as a standard in cataloging by 93 schools. Fifty-one schools cataloged at the first level (minimum), 8 at the second level, and 6 at the third. Six schools used older editions of AACR2R as their standard.

Fifty-one schools used the same cataloging standards for books, magazines, and audiovisual materials. Forty-five schools did not catalog magazines. Procedures for audiovisual materials were modified in some schools. Accession numbers instead of classification notations were used in two schools, cards were color-coded in the catalog by two, district-prepared rules were used by two, and two schools did not catalog audiovisual materials.

Processing was handled by building-level staff in 70 schools, by the district in 51, an intermediate unit serving more than one school district by 23, and outside agencies in 9.

Retrospective conversion of catalog records into machine-readable form for those schools with online catalogs had been completed in 23 schools and was in process in 10 others. Funding for this process was provided by the district (11), the state (8), and local authorities (6). Personnel responsible for retrospective con-
version included the school’s media center staff (14), regular school district staff (9), personnel contracted through the network system (8), and other agencies (7).

Thirty-three of the schools weeded their collection before retrospective conversion. This job was handled by the media center staff (33), with help from personnel from the intermediate unit serving more than one school district (1), and district-level staff (1). Teachers and department chairpersons often weeded in their areas of expertise.

**Further Research**

This exploratory study can serve as a beginning step in recording the developing role of school library media centers that participate in networks, as well as record the impact of networking on their collections and practices. Further studies are needed. This investigation was focused on the building level, whereas an earlier study was concentrated at the district level. The field also needs information on the impact of networking on students and teachers.

More details about coordinated collection development programs are needed. The effect of networking activities on collection development, selection of materials, and evaluation of collections should be further explored.

Also important, as a model for other schools, would be a look at the effect of integrated search strategies in the curriculum.

The relationship between the leadership role and the responsibility of the central staff in terms of guiding the practices used in the system were not addressed in this study. If such responsibilities are not handled at the district level, on what basis are decisions being made about the level of involvement of individual schools? The representation of building-level personnel in governance and decision-making also needs to be addressed.

Library educators would benefit from answers to two central questions: With many schools having centralized cataloging and classification, what educational preparation do school library media specialists need? Also, should library schools consider the move toward centralization and the availability of commercial cataloging in their curriculum design?

With this study some baseline data about networking in school library media centers are established, but only a small proportion of the nation’s schools is represented. Research on a grander scale is needed.

**Conclusions and Recommendations**

The analysis revealed an unfortunate pattern of the haves and the have-nots, reflecting priorities within districts. In some school districts only the high schools are being funded to automate and to participate in formal networking. In other districts many operations, including those dealing with resource sharing, are handled at the district level and are not accessible to the building-level media specialists or their patrons. As one media specialist observed:

I knew that we were very backward. However, after answering this questionnaire, I feel like I am operating a facility from the last century.

Several serious barriers that hinder networking activities of building-level personnel were identified. The strength and commitment of district supervisors are instrumental in charting networking activities. In one community the district supervisor’s position was eliminated; thus, that community lost its representation in the networking system plus the small progress that had been made toward networking within the district.

Staffing and scheduling patterns can deter networking activities. Two examples of individuals who wrote that they had neither the time nor the inclination to expand their activities for these reasons were (1) an elementary school library media specialist with thirty classes per week in the library and (2) a high school librarian responsible for three thousand students.

Additionally, responses revealed a frightening aspect of networking activities. Some schools, enthusiastic about the prospect of networking, channeled funds from book budgets for technological expenses...
without consideration of the effect on the collection or the purchase or replacement of materials.

It was evident from the answers given to the survey questions that centralized cataloging and processing had affected the knowledge that school library media specialists have about the standards and methods used in the bibliographic organization of their collections; many of them did not know what was being done. Yet the principles of bibliographic control are basic to the field of librarianship. Some method must be found to keep the individual media specialists informed about decisions that are made at the district level.

The need for standardization in automation and networking was mentioned in several of the survey responses, reflecting the concerns of all librarians dealing with automation.

In spite of these problems, building-level media specialists are motivated by the benefits of networking. One individual stated:

Networking has made our library into a "library without walls." We can offer courses, backed by materials never before available. Online searching would be useless without the ILL services provided by our regional BOCES. We serve an academic population and can prepare students for college more easily now.

For a rural school library media specialist, networks removed isolation and expanded resources. The pride school library specialists have in their networking activities is described by one school library media specialist who wrote:

School libraries have an important role to play in information networks. We have unique collections that are useful to all citizens. School librarians need to work with public and university librarians to develop networks that will benefit all participants.

Sharing the experiences of these school library media specialists will help readers recognize the importance of media specialists' participation in providing information to teachers and students in the most effective manner possible through networking.

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Indexing Overlap and Consistency between the Avery Index to Architectural Periodicals and the Architectural Periodicals Index

Angela Girai and Arlene G. Taylor

The rapid development of access to information via such avenues as the Internet requires that librarians learn more about secondary sources that serve as tools for organizing vast amounts of information into manageable pieces. Two such secondary sources are the Avery Index to Architectural Periodicals and the Architectural Periodicals Index. The overlap of article coverage and the consistency of indexing between the two indexes, which include articles from many of the same journals, were examined. Approximately 71% of the sample articles were from the journals indexed in common. However, indexing is selective, and it was found that about 45% of the sample articles were not selected for indexing by the other index. The articles that were indexed by both had considerable indexing differences. The title was recorded significantly differently about 16% of the time. There were also numerous differences in number of access points assigned and in the form of access points used by both indexes. In order to collaborate, the two agencies involved would have to agree on such things as selection criteria, treatment of special issues, guidelines for description, sources of authority control, and terminology for descriptors. Dividing up the common journals would not necessarily reduce the current work load for each index. Users of online indexes and librarians who must choose indexes to be mounted locally need to be aware of differences in comprehensiveness, terminology, recording of titles, and recording of names.

INTRODUCTION

Librarianship is faced today with two opposing forces. On the one hand the ever-increasing cost of acquisitions, especially of serial subscriptions, and the overall downsizing of budgets are forcing a reconsideration of library service that focuses on access to, rather than ownership of, information. On the other hand rapid changes in technology (e.g., the decreasing costs of computer storage and local area networks,
the development of the Internet) enhance the possibilities of access to an extent that threatens to become dizzying. It thus behooves librarians to learn as much as possible about the nature and practices of secondary sources, which are the intellectual tools that can help us sort out the masses of information into more or less useful and relevant pieces for library users.

The original impetus for this study was a desire to learn more about the nature and extent of overlap in the coverage of architectural periodical literature provided by two indexing services of very similar history and evolution: the Avery Index to Architectural Periodicals (referred to hereinafter as Avery Index) and the Architectural Periodicals Index (API). Although situated on opposite sides of the Atlantic Ocean, both services were started as natural extensions of the reference services of the two most distinguished architectural libraries in the world. While one is affiliated with an academic institution and the other with a professional society, in each case the indexing service evolved from an in-house tool to a service transcending the walls of the parent institution. One potential use of an overlap study, then, was to inform a possible collaboration between these two indexes that would reduce unnecessary duplication of effort and result in expanded access to the literature of architecture.

As the study proceeded, issues emerged pointing toward broader implications. Our findings expose new insights into the numerous variations that can occur when two different people transcribe and index the same information, in spite of the increasing standardization in areas like format, authority files, and subject thesauri. As others prepare to develop specialized indexes of their own or to select automated indexes either to mount on their local OPACs or otherwise make accessible to their patrons, they might do well to keep these variables in mind. And lest any persons think that the machine itself will be more precise than human beings in its objectivity, let them look at the many instances in which one such service, CARL UNCOVER, deriving its information by machine from tables of contents, mistakes the name of an architect for the name of the author of an article about that architect’s building.

**Review of the Literature**

For the study described here methodology was taken from two traditions of research: journal coverage overlap research and interindexer consistency research. A recent review of the journal coverage overlap literature may be found in an article by Gluck (1990), who noted that overlap had been studied for more than fifty years. He cited Martyn (1967) as the first to attempt to develop an overlap theory. Following Martyn’s work in a variety of subject areas, there were a number of analyses of coverage overlap in narrower subject areas. According to Gluck, many of these studies were focused on primary journal title overlap and ignored the overlap of the actual articles indexed. He pointed out that because most services index selectively from the journals they scan, studies that ignore the overlap of articles give only a rough indicator of overlap because an article might not be indexed in any of the secondary sources that claim to cover the journal in which the article appears (Gluck 1990, 44).

Bourne (1969a, 1969b) and Bourne, Kasson, and North (1969) did look at overlap at the article level, comparing citations from the Bibliography of Agriculture with fifteen other secondary sources. These researchers went a step further and compared the indexing of the Bibliography of Agriculture with the indexing in the fifteen other sources. They compared policies on such things as fullness of authors’ names given, inclusion of various data elements in citations, and inclusion of specialty indexes (e.g., for patent numbers). But on an article-by-article basis they compared only subject terms on one article with those on the matching record and subject terms with title words. About this part of the study Gluck says (1990, 44):

[They] detailed many of the problems in comparing bibliographic records such as transliteration, variable spellings, use of
initials in authors’ names, nonuniform data elements, and inconsistent combinations of data elements in the records of the various services.

Gluck stated that a study by Bearman and Kunberger (1977) is the high point of secondary source coverage overlap analysis because of the introduction of broader measures using highly sophisticated mathematical analysis tools and employing the concept of two-way relative overlap of the secondary sources (Gluck 1990, 45). Bearman and Kunberger concluded that overlap can be measured in several meaningful ways. The authors analyzed at the article overlap level, but did not compare content of index records.

Numerous studies produced in the 1960s, 1970s, and 1980s are listed in the bibliography to Gluck’s paper. In his summary of the literature, Gluck (1990, 47) includes among items in his list of major past achievements of journal coverage overlap research the following:

- Development of a basic approach to overlap analysis
- Realization of the need to analyze articles as well as titles
- Realization of the need to perform comparative analysis of secondary source content and indexing
- Improved cooperation among the producers and vendors of secondary sources

Virtually all of the recent overlap studies have been conducted from a subject perspective. That is, samples have been chosen by conducting subject searches and then comparing the results for overlap. One such study that went a step further was reported by Sievert and Sievert (1991). They studied the overlap of philosophical materials retrieved from FRANCIS versus Philosopher’s Index via subject searches. Then they determined whether articles retrieved from FRANCIS but not from Philosopher’s Index were actually present in Philosopher’s Index, and, if so, why they had not been retrieved. They found that 46% of the retrieved items had no comparable record due to both indexing policy and to apparent indexer error. The remaining 54% were included in the index but were not retrieved in response to the subject searched due to differences in indexing or differences in the searcher’s strategy.

All of the overlap studies have shown that there is never complete overlap between and among secondary indexing sources regardless of the purported subject coverage. That is, to achieve a high level of recall of articles on any subject, multiple databases must be searched.

The second research tradition converging in the current study is that of measuring interindexer consistency. Interindexer consistency has been defined as “a quantitative measure of the degree to which two or more indexers agree in their assignment of codes or terms representing the subject contents of a document” (Markey 1984, 155, italics added). Indeed, virtually all such researchers have looked only at the consistency of indexing the subject contents. It seems to be assumed that other elements of index records—such as titles proper, subtitles, journal titles and citations, personal names, and corporate names—will be consistent because they are being copied from the item in hand. It is also possible that there is an assumption that inconsistency in recording titles and names does not cause problems as severe as does inconsistency in subject terminology. However, there have been a number of articles discussing the difficulties of searching for names in databases where there is no authority control—e.g., Everett and Pilachowski (1986).

A review of the literature of interindexer consistency was presented in 1984 by Markey. She pointed out that the variability of the findings of such studies, from 4% to 82%, is due to one or more of at least 25 factors that influence consistency, such as readability of the text, indexing method, fatigue, or noise in the work area. She also noted that researchers used different standards for such things as “exact match of index terms” (Markey 1984, 156). The findings of the studies tend to reflect the following (Markey 1984, 165–66):

- Interindexer consistency improves when indexers choose index terms from a controlled vocabulary.
Short articles are indexed more consistently than long articles.
Interindexer concept consistency exceeds interindexer terminology consistency.
Experienced indexers attain higher interindexer consistency than inexperienced indexers.

A logical progression following upon both the overlap research and the interindexer consistency research is to examine the consistency of the entire indexing record as well as to determine the overlap of the two indexes that are the concern of the present study. The remainder of this paper is a report of a study of the overlap and interindexer consistency between the Avery Index and the API. This study is unique in its measurement of journal overlap coverage in the field of architecture and in its examination of indexing consistency with regard to recording of title information, names, citations, and description, in addition to comparison of subject descriptors.

**History**

The Avery Architectural and Fine Arts Library at Columbia University has been indexing periodical articles on architecture since 1934. Index entries were produced on catalog cards and were available only at the Avery Library until 1963, when G. K. Hall first published them in book form. Two editions and eleven supplements to the second edition were published between 1963 and 1991.

In 1979 the Avery Index became a special database available on the Research Libraries Information Network (RLIN), thus becoming available online beyond the confines of Avery Library. In 1983 the Avery Index became an operating program of the J. Paul Getty Trust and was incorporated into its newly formed Art History Information Program. Under the auspices of the Getty Trust the Avery Index has been able to expand coverage of the literature and access to the index. Availability of the Avery Index in book form to those places where online access is not possible has also been increased through the more frequent production of supplements by G. K. Hall. Finally, the Avery Index became available on Dialog in January 1990.

The British Architectural Library at the Royal Institute of British Architects began indexing articles from the periodicals received in the library in the 1930s. The index entries were first published in the RIBA Journal beginning in 1933. In 1946 their new Library Bulletin included the periodical references in a separate section. These began to be cumulated quarterly in 1965 and, in 1972, became an independent publication entitled Architectural Periodicals Index.

The API has been computerized since 1977, but it was not until 1985 that it became available for online searching as part of the integrated database of the British Architectural Library. The API has been available on Dialog since 1987.

**The Overlap**

The overlap between the Avery Index and the API needs to be defined at several levels. The top level consists of identifying those periodical titles that are scanned by both agencies for the purposes of indexing. Prior to this study a careful title-by-title comparison in 1986 had determined that 846 journal titles were indexed by the Avery Index, and 606 were indexed by the API. For the comparison, an alphabetical list of journal titles indexed from the period 1979 to 1986 was compiled (using bound volumes of the API). From this API list, a title-by-title comparison was made with a "journal phrase" (JP) search-created list of Avery Index titles indexed during the same period (1979 to 1986). The API titles that appeared on the Avery Index list were so indicated. This resulted in a match of only 270 titles that were indexed by both agencies. These 270 titles represent 32% of those indexed by the Avery Index and 44% of those indexed by the API.

As a result of experiments toward collaboration, it had been determined from test samples that during the calendar year 1986 approximately 76% of all the articles indexed by the Avery Index came from the 270 titles in the common journal list, and
that approximately 78% of all the articles indexed by the API came from the same common journal list. These measures gave quite a different impression of the size of the overlap between the two indexing services and made it desirable to conduct a study that would take the comparison to deeper levels.

A second level of overlap consists of identifying the selection parameters of each index. That is, which articles in the common journals are selected for indexing by each agency? How often do both agencies choose the same articles for indexing from each issue of a common journal? The third level of overlap exists in the comparison of indexing policies applied to selected articles. That is, when the same articles are indexed by both agencies, how are the resulting index records alike, and how are they different?

**Methodology**

In order to get more accurate figures, searches for all articles with a publication date of 1986 were conducted on Dialog in files #178 (Avery Index) and #179 (API). It was determined that the Avery Index includes 9,570 records for articles published in the year 1986, and the API includes 7,148 articles published in 1986. Given discrepancies in format, conflicting priorities, and differences in form of journal titles, it proved unmanageable to draw samples from only the commonly held journal titles. Therefore, an alternative procedure was developed, consisting of drawing samples from both databases for all articles with a 1986 date of publication and manually scanning the resulting records to select those that came from the list of commonly indexed journal titles.

Through the use of a standard formula for computing sample sizes, it was determined that to arrive at sample percentages that, after narrowing the sample records to those from the common journals, would be within 3% of the population percentages with 90% confidence, it would be necessary to draw a sample of at least 1,374 records from the API. The standard formula is

\[ n = \frac{z^2Npq}{NE^2 + z^2pq} \]

where \( z \) is the value necessary to compute 90% confidence (1.65); \( N \) is the defined universe; \( p \) is the estimated proportion; \( q \) is \( 1 - p \); and \( E \) is the value of the confidence interval desired (in this case 0.02, representing 2%).

Systematic samples were drawn by taking every nth record, starting at randomly chosen points within the groups of records that contained a 1986 publication date. A sample of 1,506 records was drawn from the Avery Index, and after manual scanning it was determined that 1,057 records, or 70.2%, of the sample were for articles published in the commonly held list of journals. A sample of 1,745 records was drawn from the API records, and after manual scanning it was determined that 1,268, or 72.7%, of these came from the commonly held list of journals. The larger-than-necessary size of the API sample was the result of a misunderstanding, but we decided to go ahead and use all available records.

The next step consisted of searching the 1,057 records drawn from the Avery Index in the API and the 1,268 records drawn from the API against the Avery Index. One of the first things that emerged from this one-to-one comparison was the impact of an explicitly different policy in the handling of special issues. The API practice is to make a single record for special issues, while the Avery Index tends to make separate records for each article, and if the title of the issue is considered significant, yet another record is made for the whole issue (see figure 1). There was a total of 68 special issues identified in the API sample. Matches were found in the Avery Index for 37 of these, and partial matches were found for another 31. In addition, 3 more records were identified as "quasi-special" (see figure 2). Given that this difference in policy results in a relationship of one record (in the API) to many (in the Avery Index), it is not surprising...
1986 Awards of Excellence / Moira Farr.

Eight winning schemes, each indexed separately.
"Canadian architect" 1986 Dec., v.31, no.12, p.11-38, photos., elevs., dwgs., site plans, secns., plans, models, ill. ISSN 0008-2872


CALL: AB C15
ID: NYCA87-V968  UD: 03-09-87  CP: onc  L: eng

0130536 A111873
BIBLIOGRAPHIC NOTES: Includes illustrations - LANGUAGE: English
COUNTRY OF PUBLICATION: Canada
NOTES: Text in English. Awards to the following illustrated buildings: Kikino Elementary School, Kikino (architects Koliger Schmidt Architect-Engineer); Edmonton Advanced Technology Centre, Edmonton (Barry Johns Architect); Hospital for Sick Children, Toronto (Zeidler Roberts Partnership); Lytle residence, Cobourg (Ian MacDonald); Sundial Square, Tsawwassen, Vancouver (Cornerstone Architects); Toronto Hilton Harbour Castle Conference Centre (Anthony Kemp); Appleton residence, Victoria (Patkau Architects); Stanley Park Tropical Centre, Vancouver (Busby Bridger Architects).

DESCRIPTORS: Awards--Canada--Canadian Architect Awards of Excellence 1986  ARCHITECT(S): Koliger Schmidt Architect-Engineer; Barry Johns Architect; Zeidler Roberts Partnership; MacDonald, Ian; Cornerstone Architects; Kemp, Anthony; Patkau Architects; Busby Bridger Architects

Figure 1. For this special issue, Avery Index (top) made one record for the whole issue and eight separate records for each article. API (bottom) made one comprehensive record, listing the eight articles. Thus, the records “match,” but the access points are very different because API has made analytical access points for the architects.
Trois architectes au Tessin.

Articles on 3 architects from the Swiss region of Ticino: Luigi Snozzi, Aurelio Galfetti, and Livio Vacchini, each indexed individually.

"AMC" 1986 June, no.12, p.[4-43], ills. ISSN 0336-1675

1. Architecture--20th century--Switzerland--Ticino

CALL: AB Am19
ID: NYCA86-V10429 UD: 09-16-86 CP: fr L: fre

0125446 A110137
Trois architectes au Tessin Three architects in Tessin. - Article by Florence Kohler, Françoise Fromonot, and others -
Architecture Mouvement Continuite, no. 12, 1986 June, p. 4-43.
BIBLIOGRAPHIC NOTES: Includes photos, plans, sections, elevations, models -
LANGUAGE: French
COUNTRY OF PUBLICATION: France
NOTES: Text in French. Includes references Includes: Luigi Snozzi at Monte Carasso, by Florence Kohler and Françoise Fromonot (illustrates mayor's residence, bank and gymnasium); Livio Vacchini at Locarno, by Jacques Lucan (illustrates architect's office, Lido d'Ascona, house at Ascona, Palazzo Giardini Rusca); Aurelio Galfetti at Bellinzona, by Jacques Lucan (illustrates restoration of the Castelgrande, post office, tennis club).

DESIGNATORS: Swiss architecture--Ticino
ARCHITECT(S): Snozzi, Luigi; Vacchini, Livio; Galfetti, Aurelio

Figure 2. These two records are not an exact match because Avery Index (top) has made three additional individual records (on which the architects are given access points) for this quasi-special issue. Note also that AIP has given an English translation of the title in addition to the title proper.

Canada Place / Monte Bryer.

Architects: Musson Cattell & Partners, Downs/Archambault, and Zeidler Roberts Partnership/Architects.
"Architects forum : the official journal of Western Canadian architects" 1986 June, no.15, p.13-14, photos.


CALL: AB Ar2418
ID: NYCA86-V11057 UD: 06-20-88 CP: bcc L: eng

0144821 A115165
Special issue. Expo 86 - Article by Patricia Bourque, and others -
BIBLIOGRAPHIC NOTES: Includes photos, illustrations -
LANGUAGE: English
COUNTRY OF PUBLICATION: Canada
DOCUMENT TYPE: Article
NOTES: Text in English. Includes: World's fair architecture and utopia (by Patricia Bourque); Modules; Buildings; Gates and plazas; Residuals; Canada Place (by Monte Bryer); Fabrics and Expo (by David Campbell).

DESIGNATORS: Exhibition buildings--Canada--Vancouver--Expo 86
IDENTIFIERS: Bourque, Patricia; Bryer, Monte; Campbell, David

Figure 3. The sample record from Avery Index (top) is an individual record for one of the articles included in the special issue record from API.
that when records sampled from the *Avery Index* were searched against the *API*, a larger number of records (113) was found to be partially matched to special issues (see figure 3). In addition there were 14 records that were partial matches to quasi-special issues. Because the number of variables added by the difference in handling special issues would have complicated the coding task exceedingly, it was decided to place these partially matched special issues in a separate category and to make no further record-by-record comparison. It would nevertheless be useful to make a more exhaustive search in a later study to determine more precisely the impact of the different policies on matters of productivity and usefulness.

Following selection of the samples and identification of the records in each sample that had also been indexed by the other index, coding sheets were designed and instructions for filling them out were written. (A copy of the coding sheet may be found in appendix A.) Graduate students in the School of Library Service at Columbia University were recruited as research assistants and were trained to compare the index records for each article that had been indexed in both indexes. Upon checking each other's work they discovered that they were not interpreting some things in the same way. For example, the coding sheet called for distinguishing between the title proper and the subtitle. Often the two indexes put different punctuation marks when transcribing title and subtitle information. The *Avery* indexers tend to follow the *Anglo-American Cataloguing Rules*, second edition (AACR2) and place a colon between title proper and subtitle. The *API* indexers often use a dash, semicolon, or period in these situations. Some research assistants were interpreting the whole statement as title proper if there was no colon. Others were using other pieces of punctuation to distinguish between title proper and subtitle. It was necessary to work out resolution of inconsistencies and recode some of the data. The coders continued to check each other's work, and with experience their coding inconsistencies diminished considerably.

**FINDINGS**

Of the 1,057 records sampled from the *Avery Index* a matching record was found in the *API* for 444 records, or 42% (see table 1). Of the 1,268 records sampled from the *API* a matching record was found in the *Avery Index* for 671, or 52.9%. Considering that in 1986 the *Avery Index* appears to have generated almost 13 articles for every 10 generated by the *API* for the same list of journals, it is not surprising that more matches were found when searching for matches to the *API* sample records than when searching for matches to the *Avery Index* sample records.

A factor that became evident as a result of the one-to-one comparison is the fact that in both institutions, the realities of staff turnover and patron service requests intrude on a smooth production path in such a way that occasionally an entire issue

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<td><strong>COMPARISON OF THE TWO SAMPLES</strong></td>
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| | *Avery Index* | | *API* |
| | n = 1,506 | | n = 1,745 |
| | No. | % | No. | % |
| Articles in sample from common list | 1,057 | 70.2 | 1,268 | 72.7 |
| Common-list articles that are special and quasi-special issues | 127 | 12.0 | 34 | 2.7 |
| Common-list articles with matched records | 444 | 42.0 | 671 | 52.9 |
| Common-list articles with unmatched records | 486 | 46.0 | 563 | 44.4 |
of an indexed journal goes to the shelves bypassing the indexers and thus is left un-indexed. Without knowing in how many instances this was the case, it was found that 486 (46%) of the Avery Index sample records represent articles that were not selected for indexing by the API, and that 563 (44.4%) of the API sample records represent articles that were not selected for indexing by the Avery Index.

As mentioned above, records for special and quasi-special issues were placed into a separate category and were not counted as either matched or unmatched. The 127 such records from the Avery Index that could not be matched in the API represented 12% of the Avery Index sample. The 34 records for special issues from API that could not be matched in the Avery Index represented 2.7% of the API sample.

DIFFERENCES IN RECORDING TITLES PROPER

It was found that 317 (71.4%) of the 444 matched records from the sample taken from the Avery Index and 496 (73.9%) of the 671 matched records from the sample taken from the API had titles proper recorded the same (see table 2). Ninety percent confidence intervals were constructed for these proportions, using the formula for the binomial proportion confidence interval:

\[
p - z\sqrt{\frac{pq}{n}} < \hat{p} < p + z\sqrt{\frac{pq}{n}}
\]

where \( p \) is the proportion found; \( q = 1 - p \); \( n \) is the number of observations in the sample; \( z = 1.65 \), the value necessary for 90% confidence; and \( p \) is the population proportion. The 90% confidence interval for the Avery Index sample is \( \pm 3.3\% \) of the population percentage, and the percentage found for the API sample is within 2.8% of the population percentage. With the small intervals around these percentages, it is reasonable to assume that the percentage of consistently recorded titles hovers around 72%.

When titles proper were different, the coders were asked to indicate whether the difference was substantial or not substantial and, if substantial, to write out the difference. Some of the differences counted as substantial might not be considered important in certain retrieval situations, but all have the potential for causing retrieval failure in the case of a word-for-word title search. They include such cases as the use of "&" versus "and"; an abbreviation versus a fully spelled-out word; two words versus two hyphenated words versus two words combined as one word; words included in one title but not in the other. Diacritics were ignored throughout the coding process partly because our printouts did not always have them, but also because they make no difference in searching in the two indexes. Punctuation and capitalization were considered to be nonsubstantial differences. All other differences were considered to be substantial. Of the 127 records in the Avery Index sample that had the titles proper recorded differently, 72 were substantially different. Of the 175 records in the API sample that had titles proper recorded differently, 108 were substantially different. The Avery Index finding is 16.2% of the matched records (90% confidence interval = \( \pm 2.9\% \))

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<td><strong>COMPARISON OF MATCHED RECORDS HAVING TITLES PROPER RECORDED</strong></td>
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<td><strong>THE SAME OR SIGNIFICANTLY DIFFERENTLY</strong></td>
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<td><strong>Avery Index</strong></td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>Matched records with title proper recorded the same</td>
</tr>
<tr>
<td>Matched records with title proper recorded substantially differently</td>
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</table>
BALTIC WHARF

A truly sensitive partnership housing project, designed by the Halliday Meecham Partnership for Rendell Partnership Developments, has brought a whole new life to the old timber wharfs on the floating harbour in Bristol.
compared with the API finding of 16.1% (90% confidence interval = ± 2.3%). Thus, it is reasonable to assume that for articles indexed by both indexes the titles are recorded substantially differently around 16% of the time.

Upon closer examination of the matched pairs, it became evident that there are several important factors that account for the substantial differences that exist in how the two agencies record the title and subtitle of an article. The first has to do with the peculiarities of layout and graphic design that prevail in positioning the title elements in architectural magazines, often creating difficulties in ascertaining
James Gowan: house at Temple Hill, Hampstead.

"Architectural design" 1986, v.56, no.4, p.16-19, elevs. ISSN 0003-8504

1. Houses--England--London 2. Gowan, James, 1923-

CALL: AB Ar455
ID: NYCAG6-V9099 UD: 08-06-86 CP: enk L: eng

Figure 7. The first two pages of an article from the journal *Architectural Design* give the name of the architect and other title information on the same line on two facing pages.

Figure 8. The difference in recording of the title proper shown in figure 7 results from API’s policy of separating the name of the architect or firm and labeling it “Architects.”

those elements that belong to a title proper and those that belong to a subtitle (see figures 4 through 6). In many of these cases, of course, because all keywords are present in both records, the difference would matter only in a title phrase search or in a search in a system where subtitles are not in the same index with titles proper.

In addition to differences in interpretation of the layout, there are reasons of policy that result in different title configurations. The API, for instance, tends to segregate the name of the architect or firm from the title proper, labeling it “Architects;” while the *Avery Index* generally follows *AACR2* and uses the name of the architect in natural order as given in the title (see figures 7 and 8).
On 1 May the Society of Architectural and Associated Technicians (Saat) became the British Institute of Architectural Technicians (BIAT). Paul Robinson talks to Graham Watts, chief executive of BIAT, and Chris Pike, the new vice-president (technical) about the developing role of architectural technicians and their objective for improved collaboration.

To many architects, architectural technicians are an unknown quantity operating on the fringes of the profession and demonstrating often disparate levels of competence.

The emergence of BIAT, however, reflects a new spirit of professionalism and a quest for status. As Graham Watts explains, the change of name is primarily a response to the changing role of the qualified architectural technician.

New Society

The concept of a mid-tier technologist, trained to support design professionals within the building industry, first appeared at the 1988 RIBA conference at Oxford. In 1982 the RIBA produced a report, The architect and his office, which clearly identified the need for and defined the role of architectural technicians. It recommended a course of recognized training which would eventually lead to membership of a new 'society' sponsored by the RIBA.

The inaugural meetings took place in January and February 1985. Originally, there was support for two tiers of membership: the first for general technicians and the second for specialist technicians trained to cope with the rapid growth of science and technology. However, the idea of a specialist technologist was dropped. The technologist was seen initially as an all-rounder—equally at home in the architect's, surveyor's or engineer's office—hence the word 'associated' in the original name of the society.

This early idealism has been gradually eroded by a process of natural selection. The 'new' institute is no longer an organisation of generalist building technicians; its work and its members are solely concentrated within the architectural sphere.

Reform

Having achieved institute status following five years of negotiations there is an urgency within BIAT to reform its corporate structure. President Paul Newman is keen to alter the institute radically by cutting through the existing bureaucracy. He aims to establish clearer lines of communication between members, the 15 regional councils and the national council. The national council is also to introduce a faster system of voting for council members. It is hoped that Architectural Technology, the BIAT bi-monthly journal will become the major instrument of communication between the institute and its members, encouraging a two-way dialogue which will widen the decision making base.

In addition to the eight elected officers on the national council, and the 15 regional councils already mentioned, there are standing committees for education, technical, practice conduct and resources, as well as joint committees with the RIBA. The new-style annual general meeting will elect the RIBA and RICS in that it will be an extension of the national council best open to all membership.

Vice-president Chris Pike is particularly keen to reframe the existing standing committee. He intends first to examine the usefulness of the technical committee, whose original objective of originating and disseminating technical information to members has never been realised due to a lack of resources. Pike feels that there are adequate sources of technical information available elsewhere which can be tapped by the institute, allowing its present resources to be used effectively.

There are 10 permanent staff at the institute including Watts. Looking after the needs of 5500 members. The membership has steadily grown through the 1980s after a slack period during the 1970s when Watts admits that the society lost direction. Surprisingly, this figure represents only a small percentage of the estimated 25 000 people working as 'technicians' in the building industry.

Watts is keen to attract more members but equally determined to raise the institute's standards. Schemes are afoot to allow unqualified technicians to join by way of a combination of proven experience and examination. Qualified members are also encouraged to participate in a CPD programme that Watts hopes will become mandatory in 1988 or 1989.

Services

BIAT provides a range of services for members, not unlike those provided by RIBA but for a more friendly fee—£65 per annum.

It produces technical publications, for example a recent guide to the Building Regulations and a weighty report Architectural technology—the constructive link, which reviewed the position of the technician within the building industry.

One of its concerns is the policing of its members. The conduct committee meets quarterly and on average reviews about 80 to 90 cases a meeting, mostly involving the approval of letterheads.

Pike stresses that of 19 recent complaints against 'technicians' 18 were about non-members. This almost insoluble problem of poorly qualified draughtsmen calling themselves technicians dissuades, he feels, the standing of the qualified architectural technician.

BIAT also provides practice advice, runs an employment bureau, supplies lists of

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Figure 9. The first page of one article from a series that appears regularly in Architects' Journal shows the series title in the same size type as the title of the article.
Technicians come of age [BIAT] / Paul Robinson, Graham Watts, Chris Pike.

British Institute of Architectural Technicians, formerly Society of Architectural and Associated Technicians.
"Architects' journal" 1986 June 18, v.183, no.25, p.79-80, ports. ISSN 0003-8466


CALL: AB B863
ID: NYCA86-V9439 UD: 03-03-92 CP: enk L: eng

0110801 AIO4448
BIBLIOGRAPHIC NOTES: Includes portraits - LANGUAGE: English
COUNTRY OF PUBLICATION: United Kingdom
DOCUMENT TYPE: Article
NOTES: Text in English. Talks to Graham Watts and Chris Pike of the British Institute of Architectural Technicians about the developing role of architectural technicians.
DESRIPTORS: Architects--assistants--societies, organisations--Great Britain--British Institute of architectural Technicians; Architects--assistants--Great Britain
ARCHITECT(S): British Institute of Architectural Technicians
IDENTIFIERS: Robinson. Paul

Figure 10. Although it is not clear from the typography in figure 9, the regular feature title has been chosen by API (bottom) as the title proper, while the Averv Index matching record uses only the individualized title, which API records as a subtitle.

Possibly the source of greatest confusion is the different treatment of what may be called series titles, or regular features. The API tends to use these series titles ahead of the individual article's title (see figures 9 and 10), even when the series title does not appear on the same page, while the Avery Index uses only the title of the individual article, generally ignoring the series or feature title except when creating a group record.

Finally, there are a few instances in which what the searches considered a matched pair (see figure 11) resulted in the coders recording substantial differences in title, subtitle, and journal citation, when in reality the API record is for two different articles, while the record from the Avery Index sample is for only one of the articles. A new examination based on this finding could result in putting records such as these in the quasi-special category that resulted from the prevalent API practice of grouping various articles with a common theme into a single record when the supposedly “matching” record from the Avery Index is for only one of the articles covered by the API record.

The penchant of the API for combining several articles on either the same architect or the same theme into a single record might be viewed as a justifiable economy of means because the reader will be directed to the very same issue in which they appear together. This is clearly exemplified in figure 12, where the searches failed to find a match for the record from the API sample because it combines three totally separate articles on two of the very large pages of the tabloid Building Design into a single record. A record was found for one of the three articles, the middle one, in the Avery Index. It seems to be the only one of the three that the Avery Index selected for indexing.

Thus, depending on the direction that
EXPO '86 Preview Center, Vancouver, Canada, 1985.


1. Exhibition buildings--Canada--Vancouver (British Columbia)--EXPO 86--Preview Centre 2. World fairs--Canada--Vancouver (British Columbia)--Expo 86 3. Freschi, Bruno

CALL: AB K34
ID: NYCA86-V10529 UD: 06-20-88 CP: ja L: mul

0123157 A107764
BIBLIOGRAPHIC NOTES: Includes photos, plans, sections - LANGUAGE: Multilingual
COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Article
DESCRIPTORS: Architects--Canada--Freschi, Bruno
ARCHITECT(S): Freschi, Bruno

Figure 11. The API record (bottom) is not really a match for the Avery Index sample record. The API record is for two articles (the first titled "Burnaby Jamatkhana" and the second titled "Expo '86 Preview Centre") about two different buildings by the same architects.

D-Day in Docklands: a new stage in the battle to save Limehouse Basin from what local people consider totally inappropriate development... / Peter Phippen.


CALL: AB B8576
ID: NYCA86-V11372 UD: 10-03-86 CP: enk L: eng

0120203 A104748
Limehouse - 'I didn't take the decision': shock confession by Patrick Jenkin; D-day in Docklands; Save joins fight against Limehouse scheme; Architects: Seifert - Article by Peter Phippen - Building Design, no. 793, 1986 June 27, p. 1, 2.
BIBLIOGRAPHIC NOTES: Includes photos, sketches - LANGUAGE: English
COUNTRY OF PUBLICATION: United Kingdom
DOCUMENT TYPE: Article
NOTES: Text in English.
ARCHITECT(S): Seifert
IDENTIFIERS: Phippen, Peter

Figure 12. The record from API (bottom) was declared as "unmatched" by the searchers because they failed to see that it covered three different articles and only one of them was indexed by Avery Index.
the searchers went, these discrepancies in indexing policy were variously coded as nonmatches or as matching records with substantial differences in recording various elements of the record. Another examination in a follow-up study should result in a better codification of these differences.

**DIFFERENCES IN RECORDING DESCRIPTIVE DETAILS**

Data tabulated about the recording of journal titles (as opposed to article titles), journal citations, and physical description are shown in table 3. It can be seen that close to 20% of the time, journal titles are recorded differently by the two agencies. These differences include such things as using "&" versus "and" and differences in abbreviation. Differences in capitalization of journal titles were ignored because the *API* often capitalizes words following the first, while *Avery Index* only capitalizes words after the first if they are proper nouns. The only nonsubstantial difference counted in this category was punctuation.

### TABLE 3

**COMPARISON OF THE TWO SAMPLES WITH RESPECT TO RECORDING OF JOURNAL TITLE, JOURNAL CITATION, AND PHYSICAL DESCRIPTION**

<table>
<thead>
<tr>
<th></th>
<th>Avery Index (n = 444)</th>
<th>API (n = 671)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Journal title</td>
<td>358</td>
<td>80.6</td>
</tr>
<tr>
<td>different</td>
<td>86</td>
<td>19.4</td>
</tr>
<tr>
<td>substantially different</td>
<td>86</td>
<td>19.4</td>
</tr>
<tr>
<td>Journal citation</td>
<td>313</td>
<td>70.5</td>
</tr>
<tr>
<td>different</td>
<td>131</td>
<td>29.5</td>
</tr>
<tr>
<td>substantially different</td>
<td>131</td>
<td>29.5</td>
</tr>
<tr>
<td>Physical description</td>
<td>148</td>
<td>33.3</td>
</tr>
<tr>
<td>different</td>
<td>296</td>
<td>66.7</td>
</tr>
<tr>
<td>substantially different</td>
<td>296</td>
<td>66.7</td>
</tr>
</tbody>
</table>

Journal citation refers to the volume, date, number, and page(s). Here, differences in order, punctuation, abbreviation, capitalization, and brackets around page numbers were completely ignored. Only differences in information content, such as "Vol. 3" versus "v. 5" or "p. 37–45" versus "p. 37–85," were noted. Journal citations were different about 30% of the time. The validity of the data is slightly obfuscated by the difference in treatment of multiple articles as discussed above (see again figure 11).

Physical description refers to information about illustrations and bibliographical references. In the *API* records, this information is labeled "Bibliographic notes:" or "Notes:"; in the *Avery Index* records, it is not labeled. Again, only differences in information content, such as "elevs." versus "Includes plans, sections, elevations" or the inclusion of a bibliographical reference in one but not the other, were noted. Physical description was the same only about one-third of the time. "Sameness" generally occurred when there were no illustrations recorded at all, and therefore both
Differences in Recording Name Access Points

The next category to be compared was that of name access points (see Table 4). These included all personal and corporate names whether they represented authors, architects (who are often the subject of articles), or subjects. The total number of name access points for each article was recorded. For the 444 matched records from the Avery Index sample, the Avery Index indexers made 687 name access points, and the API indexers made 688 name access points. For the 671 matched records from the API sample, Avery indexers made 1,192 name access points, and API indexers made 1,203 name access points. The closeness of these figures is deceiving, however. In the Avery Index sample, 130 (18.9%) of the 687 names used by the Avery Index were not used as access points at all by the API, and 131 (19%) of the 688 names used by the API were not used as access points by the Avery Index. That is, only 81.1% (90% confidence interval = ± 2.5%) of the names were used in common. In the API sample 274 (23%) of the 1,192 names used by the Avery Index were not used as access points by the API, and 285 (23.7%) of the 1,203 names used by the API were not used as access points by the Avery Index. In this case 76.3% (90% confidence interval = ± 2%) of the names were used in common.

We also recorded whether the form of names used in common was the same or different and, if different, whether the difference was substantial. The only difference not considered substantial was capitalization. Of the 557 names in the Avery Index sample, 307 were exactly the same. That is, only 44.7% (90% confidence interval = ± 3.1%) of the names in the Avery Index sample (or 55.1% of the names used in common) appeared in exactly the same form on the matched records from the API. Of the 918 names used in common in the API sample, 507 were exactly the same. That is, only 42.1% (90% confidence interval = ± 2.3%) of the names in the API sample (or 55.2% of the names used in common) appeared in exactly the same form in the matched records from the Avery Index. The differences between the forms of all but four names (differing only in capitalization) in each case were recorded as substantial. Many of the differences recorded were because one agency gave a birth date for a personal name, while the other agency did not. Other differences resulted from such things as different usages of “&” and “and.”

Table 4

Comparison of the Two Samples with Respect to Recording of Name Access Points

<table>
<thead>
<tr>
<th>Avery Index Sample (n = 444 matched records)</th>
<th>API Sample (n = 671 matched records)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avery Index</strong></td>
<td><strong>API</strong></td>
</tr>
<tr>
<td><strong>No.</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Name access points assigned on sample records</td>
<td>687</td>
</tr>
<tr>
<td>Name access points assigned on matching records</td>
<td>688</td>
</tr>
<tr>
<td>Names used by both agencies on matching records</td>
<td>557</td>
</tr>
<tr>
<td>Names in exactly the same form on matching records</td>
<td>307</td>
</tr>
</tbody>
</table>
differences resulted from different spellings or from differences in words included or not included as parts of names. Further analysis will be done to categorize the differences found in forms of names.

**Differences in Recording Descriptors**

The next category analyzed was that of descriptors. These correspond to subject headings in cataloging practice. Each institution uses its own in-house thesaurus, and, therefore, it was not expected that many matching descriptors would be found. Because of the difference in the practice by the two agencies of providing subdivisions after main topics, the coders were instructed to count elements of descriptors, as well as whole descriptors. An element was considered to be any word or group of words separated from the rest of the string by dashes or by parentheses. For example, the following *Avery Index* descriptor has eight elements: Period rooms—Neoclassical—Conservation and restoration—United States—Philadelphia (Pennsylvania)—Philadelphia Museum of Art—Lansdowne House drawing room. For the 444 matched records from the *Avery Index* sample, the *Avery* indexers assigned 564 descriptors with 1,964 elements, and the *API* indexers assigned 546 descriptors with 1,851 elements (see table 5). This is an average of 1.3 descriptors and 4.4 elements per record assigned by the *Avery* indexers and 1.2 descriptors and 4.2 elements per record assigned by the *API* indexers. For the 671 matched records from the *API* sample, the *Avery* indexers assigned 981 descriptors with 3,445 elements, while the *API* indexers assigned 897 descriptors with 3,142 elements. This is an average of 1.5 descriptors and 5.1 elements assigned per record by the *Avery* indexers, and 1.3 descriptors and 4.7 elements assigned per record by the *API* indexers. It can be seen that the *Avery* indexers consistently on average supply slightly more descriptors with somewhat more elements than do the *API* indexers.

We also attempted to compare the terminology used for descriptors in the two indexes. It was found that 40 descriptors, including all elements, of the 564 descriptors assigned by the *Avery* indexers to the 444 *Avery Index* sample records were matched exactly by the *API* indexers on the *API* matching records. That is, 7.1% (90% confidence interval = ± 1.8%) of the descriptors in the *Avery Index* sample appeared in exactly the same form in the

**TABLE 5**

**Comparison of the Two Samples with Respect to Recording of Descriptors**

<table>
<thead>
<tr>
<th></th>
<th><em>Avery Index</em> Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 444 matched records)</td>
<td>API Sample</td>
</tr>
<tr>
<td>(n = 671 matched records)</td>
<td></td>
</tr>
<tr>
<td><strong>No.</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
</tr>
<tr>
<td>Descriptors assigned on sample records</td>
<td>564</td>
</tr>
<tr>
<td>Descriptors assigned on matching records</td>
<td>564</td>
</tr>
<tr>
<td>Descriptors identical in form on matching records</td>
<td>40</td>
</tr>
<tr>
<td>First elements same on matching records</td>
<td>196</td>
</tr>
<tr>
<td>First elements present in descriptor in matching record</td>
<td>224</td>
</tr>
</tbody>
</table>
matched records from the API. For another 5 descriptors (or 0.1%) the form was identical except for a difference in form of a personal or corporate name element or in form of a geographic name subdivision that was different only because of inversion (e.g., "Chicago (Illinois)" versus "Illinois—Chicago"). For the API sample 68 of the 897 descriptors assigned to the 671 API records were matched exactly by the Avery indexers on the Avery Index matching records. That is, 7.6% (90% confidence interval = ± 1.5%) of the descriptors in the API sample appeared in exactly the same form in the matched records from the Avery Index. Another 10 (0.1%) were the same except for differences in form of personal, corporate, or geographic name elements.

More positive is a look at the number of times the first element of a descriptor in the sample record was identical to the first element of a descriptor in the matching record or was present somewhere in a descriptor in the matching record. In the Avery Index sample, 196 first elements (34.8% of the 564 descriptors assigned by the Avery indexers) had matching first elements in the API records, and another 28 first elements (5%) were present in an API descriptor, although not as the first element. In the API sample, 292 first elements (32.6% of the 997 descriptors assigned by the API indexers) had matching first elements in the Avery Index records, and another 63 first elements (7%) were present in an Avery Index descriptor. This means that 224 first elements from descriptors in the Avery Index sample were present in the API descriptors on matching records, and 355 first elements from descriptors in the API sample were present in the Avery Index descriptors on matching records. That is, 39.7% (90% confidence interval = ± 3.4%) of the first elements from the descriptors in the Avery Index sample were present in the API descriptors in matching records, and 39.6% (90% confidence interval = ± 2.7%) of the first elements from the descriptors in the API sample were present in the Avery Index descriptors in matching records.

Because of the complications of coding, it was not possible within this project to determine how many times second or later elements of a descriptor were matched by some element of a descriptor assigned by the other agency, but we know that there were some such instances. In addition there were cases where the same concept was referred to by different terminology (e.g., "elevator" versus "lift"; "Universities and colleges—buildings" versus "University buildings"). In other instances the concepts chosen were different. Further analysis is needed to determine the extent of each of these situations.

Geographic elements of the descriptors were considered separately (see table 6). In the Avery Index sample, the Avery

<table>
<thead>
<tr>
<th>Geographic names assigned on sample records</th>
<th>396</th>
<th>627</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic names assigned on matching records</td>
<td>393</td>
<td>649</td>
</tr>
<tr>
<td>Geographic names assigned by both agencies using same elements</td>
<td>200</td>
<td>310</td>
</tr>
</tbody>
</table>

**Table 6**

Comparison of the Two Samples with Respect to Recording of Geographic Names
indexers assigned 396 geographic names (made up of 813 elements) while the API indexers assigned 393 geographic names (made up of 879 elements). In the API sample, the Aery indexers assigned 649 geographic names (made up of 1,523 elements), and the API indexers assigned 627 geographic names (made up of 1,416 elements). If geographic elements were the same except for inversion (e.g., “Portland (Maine)” versus “Maine—Portland”) they were counted as being the same. In the Aery Index sample the same geographic elements were assigned by both the Aery and the API indexers in 200 cases, which constitute 50.5% (90% confidence interval = ±4.1%) of the 396 geographic names assigned by the Aery indexers. In the API sample the comparable figure is 310 geographic names, or 40.4% (90% confidence interval = ±3.3%), of the 767 geographic names assigned by the API indexers. Many of the differences are accounted for by the depth of the elements used rather than by actual differences in identification of place (e.g., “Canada—Toronto” versus “Canada—Toronto (Ontario)”).

The last category to be counted was site names as an element of descriptors (see table 7). In the Aery Index sample, site names were given by the Aery indexers 224 times, while they were given 206 times by the API indexers. In the API sample the Aery indexers assigned 405 site names, and the API indexers assigned 366 site names. Ninety of the site names on the records from the Aery Index sample were matched in form by site names on the matching API records. This constitutes 40.2% (90% confidence interval = 5.4%) of the 224 site names on the Aery Index records. In the API sample 137 site names were given in identical form on matching records. This represents 37.4% (90% confidence interval = ±4.2%) of the 366 site names assigned by the API indexers.

**CONCLUSIONS**

The situation described here is reminiscent of that in United States cataloging practice before the advent of the bibliographic utilities, around twenty-five years ago. Individual libraries followed their own policies and practices. Many began with cataloging copy from the Library of Congress (LC), but they adapted it extensively. LC’s authority file was not available outside LC, and libraries established names according to their own interpretations of the rules. A difference, however, was that the library community did have a common

### TABLE 7

**COMPARISON OF THE TWO SAMPLES WITH RESPECT TO RECORDING OF SITE NAMES**

<table>
<thead>
<tr>
<th></th>
<th>Aery Index Sample</th>
<th>API Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 444 matched records)</td>
<td>(n = 671 matched records)</td>
</tr>
<tr>
<td>Aery Index</td>
<td>API</td>
<td>Aery Index</td>
</tr>
<tr>
<td>Site names assigned on sample records</td>
<td>224</td>
<td>366</td>
</tr>
<tr>
<td>Site names assigned on matching records</td>
<td>206</td>
<td>405</td>
</tr>
<tr>
<td>Site names assigned by both agencies using same form of name</td>
<td>90</td>
<td>137</td>
</tr>
</tbody>
</table>
Barcelona reconstructs an icon of architectural modernism.

Reconstruction of the German Pavilion designed for the 1929 Barcelona International Exposition by Mies van der Rohe.

"Architectural record" 1986 Aug., v.174, no.9, p.60-61, photos. ISSN 0003-888X


CALL: AB Ar44
ID: NYCA86-V9914 UD: 11-25-91 CP: nyu L: eng

0122573 A107163

LANGUAGE: English
COUNTRY OF PUBLICATION: United States
DOCUMENT TYPE: Article
NOTES: Text in English.
DESCRIPTORS: Exhibition buildings--Spain--Barcelona--Barcelona Pavilion
ARCHITECT(S): Mies van der Rohe, Ludwig--1886-1969

Figure 13. In this example, Acery Index used the “complete and proper” site name (i.e., “German Pavilion and Industrial Exhibits”), while API used the “better known” form (i.e., “Barcelona Pavilion”).

Architecture _a la carte: Brion family cemetery: scenes in sequence / Tetsuo Itoh.

"Architecture and urbanism" 1986 Jan., no.1(184), p.8-9, photos., port. ISSN 0001-0316


CALL: AB K34
ID: NYCA86-V1808 UD: 02-10-86 CP: ja L: mul

0142878 A113632

BIBLIOGRAPHIC NOTES: Includes photos, portraits

LANGUAGE: Multilingual
COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Article
DESCRIPTORS: Cemeteries; Appraisal of buildings--Italy--San Vito d'Antivole--Cimitero Brion-Vega
ARCHITECT(S): Scarpa, Carlo--1906-1978
IDENTIFIERS: Ito, Tetsuo

Figure 14. In this example, Acery Index used the English form of the site name (i.e., “Brion-Vega Cemetery”), while API used the name in the Italian vernacular (i.e., “Cimitero Brion-Vega”).
set of rules for descriptive cataloging as a standard, which the agencies that create the Avery Index and the API do not.

CONSIDERATIONS FOR COLLABORATION

For the two agencies involved, it is clear from this examination that there are many issues to be negotiated and resolved before there can be a productive collaboration. Regarding the matter of selection practices, the results make clear that the two agencies vary considerably, because they coincided in barely more than half the articles selected for indexing. This means that in order to have collaboration, criteria for selection would have to be clearly spelled out and included in a manual. It also means that if the two agencies were to have mutual trust that all the articles of interest to both were being selected, each agency would have to increase the proportion of articles indexed from each issue of the journals for which they would be responsible. That is, while each agency might be responsible for indexing only half of the 270 journals that they both index, at the same time they would have to almost double the number of articles selected for indexing from each issue.

When the same article is selected for indexing by both agencies, the differences detailed in these findings point to the need for action in several areas. There are matters of policy that can be resolved through the development of a clearly articulated indexing manual that would codify the policies on which mutual agreement should be reached. Such a manual should include criteria to determine at least the following:

- How would special issues be treated—i.e., one collective record or many individual ones?
- If several articles on a common theme or architect are to be combined in a single record, what conventions should be followed to ensure that users can distinguish between titles followed by second titles and titles followed by subtitles?
- What measures should be taken to ensure that all issues of a journal go through the indexing process regardless of the operational demands of a busy library?
- What guidelines would be needed for recording the title of an article? Should AACR2 be used, or should there be recognition that the most effective searching algorithm for article titles in an online environment is title keyword?
- What guidelines would be given for enriching article titles either by translation of foreign titles into English (as is done by the API; see again figure 2) or by adding a descriptive word or phrase such as "[exhibition review]" or "[obituary]" (as is done by the Avery Index; see again figure 6)?
- What guidelines would be necessary for consistent extent and level of detail in recording the types of illustrative material in the physical description area?
- What guidelines would be needed for the addition of birth and death dates when a name has been established without them and there is no conflict? Some of the differences could be resolved easily by pointing to a third authoritative source that both parties might agree to follow rigorously, for instance:
  - AACR2 rules for physical description
  - Use of the form of journal name that has been established by one of the respective national libraries
  - Use of certain gazetteers for the source of place names and geographical descriptors

Finally, other differences point out the desirability of shared and jointly created new authority files:

- For personal and corporate names: The differences between LC and British Library authority records along with the large percentage of names that need to be established for the periodical literature long before full-length books are published by or about them almost demand a shared name authority file with plentiful cross-references. The fact that around 80% of all the names used were used in common indicates the usefulness of such a shared file. That about 55% of names used in common are exactly the
same without the existence of such a shared authority file is encouraging.

- For architectural site names: The fact that about 60% of site names were different on the matched records indicates the need for coordination.

It might be expected that one conclusion should be that authority work for descriptors be coordinated. This is a noble goal, but one that the entire bibliographic-control community is finding difficult to deal with. In the first place it is coming to be understood that it is very difficult for two indexers, or even the same indexer at different times, to reach the same conclusions as to what an article or other item is "about." In 1968 Patrick Wilson discussed the problem at some length (Wilson 1985). He pointed out that determining what something is about depends to some extent upon one's knowledge or opinions about the world and upon understanding a work in different ways depending upon one's experiences. Wilson also described different methods that people use to come to an understanding of what a work is about. The different methods do not necessarily lead to the same result. A number of studies have found that people do not think of "aboutness" in the same way. In one such study by Oliver Lilley, 340 students looked at six books and suggested an average of 62 different headings for each book (Lilley 1986). It seems clear that in a cooperative indexing project, interindexer inconsistency in determining "aboutness" would be accepted between agencies as it is now accepted among indexers in the same agency.

There should, however, be some attention given to the terminology used to express a concept. British versus American terms, for example, could be connected at the searching stage so that a user searching for articles on "lifts" would also be given articles indexed with the term "elevators." Similarly, consistently different usages could be identified (e.g., the API's subdivision "preservation, restoration" and the Avery Index's subdivision "Conservation and restoration"). These could be handled as suggested for British versus American terms, or a consistent list could be developed.

The development of the Art & Architecture Thesaurus (AAT) has for some time held the promise of a thoroughly authoritative, hierarchically arranged, comprehensive vocabulary to which both agencies could migrate as a common denominator. Such migration would be expected to be facilitated by the fact that the AAT used the subject terminology of both the API and the Avery Index as sources for its development and has attempted to keep track of the origins of each term through the use of codes. Both agencies have collaborated over the years in the development and refinement of AAT terminology, have participated in tests, and have contributed to the elaboration of several possible application protocols.

The availability of the AAT online in RLIN might provide the occasion for an experiment as a follow-up to this study. It would be interesting to test whether, given a newly developed application protocol and access to the same AAT online, a group of indexers from both agencies could achieve any greater consistency in application of terminology than has been demonstrated through this study.

While collaboration between the Avery Index and the API seems easy conceptually, and the areas of overlap and coincidence are considerable, the findings of this study demonstrate that indexing is not an exact science, and a substantial amount of work is needed before such collaboration can be successfully implemented. The time that might be gained in reducing the number of journals each agency must scan might be again lost due to the increased work load implied by expanded selection criteria and the additional efforts required to develop and implement rigorous practices. However, as has been found to be true in the cataloging community, time is gained by adherence to clear standards because of reduction in decision-making time. In addition users of the two indexes would benefit from the increased consistency.

**Considerations for Users**

For users of online indexes (both end-users and reference intermediaries), for librarians
who must choose among indexes to be mounted locally, or for those who are building their own periodical databases, there are likewise a number of implications:

- **Differences in comprehensiveness and treatment:** In this case, 58% of the *Avery Index* records were not found in the API, and 47.1% of the API records were not found in Avery Index. In many cases, indexers for the *Avery Index* and the API chose different articles from the same journals. In some cases, some issues of journals were completely missed. There were other cases where the API grouped several articles into one record, thus changing the “aboutness” addressed by descriptors. Special issues were also treated differently. Decisions must be made about the importance of having a special issue indexed as a unit versus having each article in the issue indexed separately.

- **Differences in terminology:** In this study, British versus American differences in word usage were a factor, as were the different thesauri used by the two indexes.

- **Differences in number of descriptors:** Databases that have more descriptors and more elements, as did the *Avery Index* records in this study, have the potential for retrieval of more relevant records as the result of a search.

- **Differences in the recording of titles:** Approximately 28% of the titles proper in this study were recorded differently. More than half of these (about 16% of the titles proper) were recorded so substantially differently as to affect retrieval of the record in a title search. This finding should be of particular concern to creators of new databases. Recording of titles from articles is not necessarily a matter of copying what one sees. There should also be consideration of the issue of title enrichment. The API gives English translations of titles in the title field, while the *Avery Index* adds explanatory words.

- **Differences in the recording of names:** In this study, approximately 19% of the personal and corporate names indexed in the *Avery Index* sample were not included in the API, and about 24% of the personal and corporate names indexed in the API sample were not included in the *Avery Index* matching records. Of the names included in both, almost half were recorded differently.

Earlier studies of overlap in secondary sources have found that a searcher would always miss relevant material if only one source were searched. Earlier consistency studies have found that consistency in assignment of subject descriptors is usually low. Of 56 studies reviewed by Markey (1984), 38 had consistency levels below 50%. There has been anecdotal evidence of much inconsistency in the recording of names. This study confirms these earlier findings and adds evidence of inconsistency in the recording of names, titles, descriptive information, and treatment of special issues. Perhaps it is time to give the kind of attention to indexing standards that has previously been given to cataloging standards.

**Acknowledgments**

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WORKS CITED


Lilley, Oliver, as reported by Marcia J. Bates. 1986. Subject access in online catalogs: A design model. Journal of the American society for information science 37, no.6: 357–76.


## APPENDIX A
### CODING SHEET

<table>
<thead>
<tr>
<th>No.</th>
<th>Title: Proper</th>
<th>Same?</th>
<th>Signif?</th>
<th>If significant is yes then explain:</th>
<th>API (Arch. Database)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subtitle</td>
<td></td>
<td></td>
<td>AI (Avery Index)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parallel title</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Journal Title</td>
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<td></td>
<td>Journal Citation</td>
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<td></td>
<td>Physical Description</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Names</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Form

1. 
2. 
3. 
4. 
5. 
6. 

### Descriptors

- **(topical elements)**
- **(geographic elements)**
- **(site names)**

### AI Subject Headings

- **First Element:**
  1. 
  2. 
  3. 
  4. 

### API Descriptors

- **First whole element:**
  1. 
  2. 
  3. 
  4. 

- **Different first element:**
  1. 
  2. 
  3. 

### If different explain:

- **AI**
- **API**

1. 
2. 
3. 

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Characteristics of Subject Headings in the Library of Congress BOOKSM Database

Martha O'Hara Conway

A thorough understanding of current subject cataloging practice, especially Library of Congress practice, will assist librarians in making the best use of new and emerging technology to ease the task of constructing subject headings. To gain insight into the most current subject cataloging techniques at the Library of Congress, a random sample of one thousand bibliographic records with one or more 6XX fields and Library of Congress card numbers assigned from 1988 to the present was drawn from the BOOKSM database. Library of Congress catalogers rely heavily on the system of free-floating subdivisions in the process of constructing subject headings. Attempts to improve the subject cataloging process must take into account this fundamental characteristic of the Library of Congress subject headings system.

Subdivisions have long been an integral component of the Library of Congress (LC) subject headings system, although today they are more abundant in our catalogs and more difficult to apply than was probably ever imagined. Gone are the days when the cataloger's task, at least according to Haykin, was simple: Determine the subject of the book, find it in Library of Congress Subject Headings (LCSH), and use it for the book (Haykin 1947). Because only a fraction of all possible heading-subdivision combinations are listed in LCSH, the subject cataloger's task is governed increasingly by a complicated system of rules rather than by what is printed in the 4,904 pages that make up the fourteenth edition of LCSH. In fact, the problem is so great that the Library of Congress, with funding from the Council on Library Resources, recently convened a large group of experts to address exclusively the many issues that make subdivisions the most burdensome aspect of the Library of Congress subject headings system. This meeting was the Subject Subdivisions Conference, which was held May 9–12, 1991, at Airlie, Virginia. In addition to relying on each other, however, librarians are learning how information technology can ease tasks, solve problems, and improve services. A thorough understanding of current subject cataloging practice, especially Library of Congress practice, should assist librarians in making the best use of new and emerging technology to ease the task of constructing subject headings.

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Standard cataloging practice, for want of an absolute measure, has long been defined as congruence with Library of Congress cataloging practice (Chan 1989, 349). Chan identified patterns of inconsistency in subject cataloging between LC and non-LC cataloging records and suggested that some of the variations could be lessened by better external communication of LC cataloging policies (1989, 357). Indeed, such information is critical to a thorough understanding of current subject cataloging practices that, in the eyes of many, have grown decidedly too complex. Additionally, however, there is a notable lack of empirical data that reflect current subject cataloging practices at LC.

The purpose of the research described in this article is to answer two fundamental questions: (1) What do the subject headings currently assigned by LC catalogers look like? (2) From what sources do LC catalogers derive the subdivisions appended to headings?

BACKGROUND

The application of Library of Congress subject headings requires the extensive use of subdivisions because complex topics are often represented by the combination of a number of different concepts into a single subject string. Until 1974, subject catalogers at LC regularly established heading-subdivision combinations by submitting proposals for review, approval, and printing in LCSH. In 1974, it was decided that most heading-subdivision combinations would in the future be constructed according to rules instead of according to individual authorizations. The term free-floating subdivision was coined to designate subdivisions that could be appended to headings according to rules.

Limited use of free-floating subdivisions actually dates back to the second edition (1919) of Subject Headings Used in the Dictionary Catalogues of the Library of Congress, in which certain form subdivisions were used in cataloging but omitted from the alphabetical list. The fourth edition (1943) of LCSH introduced the concept of pattern (model) headings, which means that certain headings are used as models for subdivisions that can be used with other headings in the same subject category.

The long introduction to the eighth edition (1975) of LCSH included a list of the most commonly used subdivisions (free-floating subdivisions) and scope notes governing their application. The list was revised and published in 1981 under the title Library of Congress Subject Headings: Guide to Subdivision Practice. In 1984, a preliminary edition of the Subject Cataloging Manual: Subject Headings (SCM) was published to assist other libraries in applying LC subject headings. Catalogers now use the fourth edition of the SCM (1991) as the primary source for finding appropriate subdivisions and guidelines governing their application. At the request of LC subject cataloging staff, a single, alphabetical list of all free-floating subdivisions used in the LC subject heading system was produced. The annual publication Free-Floating Subdivisions: An Alphabetical Index serves as an index to the subdivisions in the SCM.

Between 1974 and 1985, the Library of Congress deleted from LCSH many heading-subdivision combinations that can be constructed according to rules. Because subject authority records exist only for headings that are printed in LCSH, few authority records are available to assist in the construction or the validation of heading-subdivision combinations. Most of the subject headings in a library's catalog, however, are likely to contain subdivisions (O'Neill and Aluri 1981; Frost and Dede 1988; Drabenstott and Vizine-Goetz, forthcoming).

REVIEW OF THE LITERATURE

The widespread adoption of the online catalog has prompted researchers to assess the appropriateness of subject cataloging practices designed for the card catalog (Chan 1990b). The OCLC Online Computer Library Center's database, because it contains millions of catalog records contributed by a large number and variety of libraries, has proved to be fertile ground for research efforts aimed at better understanding past and present subject cataloging practices (O'Neill and Aluri 1981;
Chan 1989; Drabenstott, forthcoming). Because the OCLC database and other large catalogs represent a twenty-year accumulation of cataloging practice, however, they can function only as a barometer of current LC practice.

More than ten years ago, O'Neill and Aluri conducted a study that indirectly shed some light on LC practice (1981). They examined the characteristics of subject headings assigned to bibliographic records in the OCLC database. The study, based on more than 50,000 subject headings appended to 33,455 monographic records, revealed that LC records had a slightly higher number of subdivisions than records contributed by other libraries.

Frost and Dede analyzed topical and geographic subject headings from a sample of 3,814 bibliographic records in the library catalog at the University of Michigan to determine the degree of match with the 10th edition of LCSH and to identify the types of heading conflicts that lend themselves to automatic subject authority control (Frost and Dede 1988). They found that more than two-thirds of the geographic and topical main headings had subdivisions and that 63% of the subdivisions were topical or form subdivisions. They also found that only 23% of the headings with subdivisions matched LCSH exactly. The researchers noted that because almost 94% of the topical subdivisions that did not match LCSH were found on free-floating lists, some consideration should be given to developing a machine-readable file of free-floating subdivisions for validation purposes.

Markey and Vizine-Goetz (1988) conducted a detailed study of the characteristics of authority records for topical subject headings and geographic names in the machine-readable Library of Congress subject headings (LCSH-mr). They demonstrated again that the LCSH-mr has limited value for validating assigned headings. The majority (70%) of topical subject headings in the LCSH-mr are unsubdivided, and almost half (48%) of the geographic name headings do not contain any subdivisions.

Given the demonstrated inadequacy of the LCSH-mr as a mechanism for validating assigned subject headings, it is not surprising that the literature bears witness to a call for machine-readable subdivision records (Holley and Killheffer 1982; Cochrane 1986). Drabenstott (forthcoming) recently undertook an extensive study of subdivided topical and geographic headings in the OCLC database. The analysis served as the basis for several recommendations for enhancements to the contents of machine-readable authority records to improve the quality and accuracy of subdivision assignment.

**Structure of Subject Headings**

Subject headings in the LC BOOKSM database are represented by several elements, including a tag number, two indicators, and a variable number of subfields. The three-digit tag preceding the heading identifies the subject heading type: Personal Name (600), Corporate Name (610), Meeting Name (611), Uniform Title (630), Topical Heading (650), or Geographic Name (651). The first indicator is used only for personal, corporate, and meeting name subject headings to identify the structure of the name. The second indicator shows the source of the subject heading, e.g., LCSH, Medical Subject Headings, etc. Each subfield is separated by a delimiter (,) and identified by a subfield code. Subfield codes are not embedded in the text of the heading but rather precede the heading in the order in which the subfields they represent appear in the heading. The first part of the subject heading—the main heading—is identified by the subfield code + a. Topical and form subdivisions are coded + x, period subdivisions are coded + y, and geographic subdivisions are identified by the subfield code + z. Other subfield codes are used to separate various elements of subject headings, such as dates (+ d). A typical subject

![650 -0*ayzx Art, Modern*20th century*Italy*Exhibitions](image-url)

Figure 1. Typical Subject Heading from the BOOKSM Database.
heading as it appears in the LC database is shown in figure 1.

**RESEARCH METHODOLOGY**

The BOOKSM database contains more than three million bibliographic records for monographs cataloged by LC in English since 1968 and in all languages since 1980. Bibliographic records for works in Japanese, Arabic, Chinese, Korean, Persian, Hebrew, and Yiddish are not included in the BOOKSM database. Approximately 84% of the bibliographic records contain one or more 6XX fields, and slightly more than 312,000 of those records represent items that have been cataloged since 1988.

To gain insight into the most current subject cataloging practices at LC, a random sample of 1,000 bibliographic records with one or more 6XX fields and LC card numbers assigned from 1988 to the present was drawn from the BOOKSM database. The 1,000 bibliographic records yielded 2,463 6XX headings, of which 199 were eliminated from the analysis because they fell outside the scope of the research. Headings of this type include Medical Subject Headings (MeSH), children's headings, and headings tagged 653 (Index Term—Uncontrolled) or 655 (Index Term—Genre/Form). Also excluded from the study were 29 unauthorized main headings (e.g., God [Islamic], which should be God [Islam]) and 17 unauthorized heading-subdivision combinations (e.g., Borgomanero [Italy]—Catholic Church—History— Exhibitions, which is not a valid combination because Catholic Church is not authorized as a subdivision under headings for names of places). The resulting data set contained 2,218 valid LC subject headings.

Each main heading was searched in the 13th edition of LCSH. If the heading was not found in LCSH it was sought in the online name authority file or the online subject authority file, or it was determined to be a valid, unprinted heading. Headings of this type include those that are constructed with a free-floating phrase such as ... in literature or are constructed according to rules for uniform titles. Each heading additionally was categorized according to whether it could be subdivided geographically and whether it belonged to a particular category of headings controlled by pattern headings.

Subdivided headings were analyzed to determine the number and type(s) of subdivision(s) appended to each heading. For the purposes of the study, form subdivisions were distinguished from topical subdivisions even though both types of subdivisions appear in the x subfield. Additionally the sources of the subdivision(s) in each heading-subdivision(s) combination were determined.

**FINDINGS**

Because subject headings are not regularly assigned to all types of monographic materials, the average number of subject headings per record can be a misleading figure. In this study, only those bibliographic records with one or more 6XX headings have been included. Each of these records has on the average 2.5 6XX headings. Of those headings, 92% are LC subject headings, 5% are LC Annotated Card Program (children's) subject headings, 3% are MeSH subject headings, and less than 1% are uncontrolled subject terms. Each record has an average of 2.3 LC subject headings. In the following discussion, only the 2,218 valid LC subject headings in the sample are described.

General characteristics of the sample serve as the basis for addressing the first research question: What do the subject headings currently assigned by LC catalogers look like?

Seventy-four percent of the headings assigned to current monographs are topical headings, 14% of the headings are geographic name headings, and 8% represent personal names. Corporate name headings, headings for uniform titles, and meeting name headings comprise the remaining 4% of the sample. These figures are very similar to those reported in previous studies and, when compared with actual distributions in the BOOKSM database, confirm that the sample is representative of the population.

Overall, 86% of the headings in the sample are found in the 13th edition of LCSH. Ninety-nine percent of the topical
headings assigned by LC catalogers are printed in LCSH. Of those that are not printed in LCSH, 13 are new headings found in the online subject authority file (e.g., German reunification question (1949–1990) and Hypermedia systems) and 5 are valid unprinted headings constructed with a free-floating phrase (e.g., Vietnamese Conflict, 1961–1975, in Art and Wilderness Areas in Literature). Only 12% of the personal name headings assigned by catalogers are printed in LCSH. This is not surprising because these and other headings residing in the name authority file are omitted from LCSH unless they are used as pattern headings or examples (e.g., Shakespeare, William, 1564–1616) or unless a subdivision or special instruction for subject usage must be printed.

The distribution of the number of subdivisions by type of heading is illustrated in table 1. The first number in each cell represents the frequency with which the number of subdivisions occurred with the type of heading. The second number in each cell is the percent of the total frequency count for that row represented by the cell. The third number in each cell is the percent of the total frequency count for that column represented by the cell.

The great majority (74%) of the headings currently assigned by LC catalogers contain subdivisions. In fact, 35% of the subject headings in the sample contain at least two subdivisions, although the number of subdivisions varies widely with the type of subject heading. While more than half (52%) of the personal name headings do not contain any subdivisions, less than 4% of the geographic name headings are unsubdivided. Almost three-quarters of the topical headings, however, contain subdivisions, and of those almost half (48%) contain two or more subdivisions. The most frequently occurring type of heading is a topical subject heading with one subdivision.

The distribution of the four types of subdivisions by type of heading is given in table 2. Because form and topical subdivisions function quite differently in LC subject headings, they are distinguished one from the other for the purposes of this study, although both types of subdivisions are assigned in the •s subfield. Forty-one percent of the subdivisions appended to headings are topical subdivisions. For the purposes of this study, topical subdivisions include, for example, the subdivisions — History, —Law and legislation, —Research, and —Social conditions. Thirty-two percent of the subdivisions are geographic subdivisions, and only 7% are period subdivisions. Twenty percent of the subdivisions in the sample are form subdivisions. Form subdivisions, so identified on a subjective, as-encountered basis, include, for example, the subdivisions —Bibliography, —Congresses, —Dictionaries, —Juvenile literature, —Maps, and —Pictorial Works. A total of 41 subdivisions in the sample are categorized as form subdivisions. The 41 form subdivisions encountered in the sample are:

- Archival resources
- Archives
- Atlases
- Bibliography
- Biobibliography
- Biography
- Catalogs
- Congresses
- Diaries
- Dictionaries
- Directories
- Discography
- Early works to 1800
- Exhibitions
- Facsimiles
- Fiction
- Glossaries
- Glossaries, vocabularies, etc.
- Guidebooks
- Handbooks, manuals, etc.
- Illustrations
- Indexes
- Juvenile
- Juvenile fiction
- Juvenile literature
- Lab manuals
- (Language)
- Librettos
- Manuscripts
- Maps
- Pamphlets
- Photographs
- Photographs from space
| TABLE 1  |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | 0               |                | 1               |                | 2               |                | 3+              |                | Total           |                |
|                | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. |
| Personal name (590) | 89  | 51.74 | 15.59 | 64  | 37.21 | 7.31  | 17  | 9.58  | 2.81  | 2   | 1.16  | 1.20  | 172 | 100  | 7.75  |
| Corporate name (610) | 28  | 39.44 | 4.90  | 33  | 46.46 | 3.77  | 8   | 11.27 | 1.32  | 2   | 2.82  | 1.20  | 71  | 100  | 3.20  |
| Meeting name (611) | 2   | 100.00 | 0.35 | 0   | 0.00  | 0.00  | 0   | 0.00  | 0.00  | 0   | 0.00  | 0.00  | 2   | 100  | 0.09  |
| Uniform title (530) | 11  | 61.11 | 1.93  | 5   | 27.78 | 0.57  | 2   | 11.11 | 0.33  | 0   | 0.00  | 0.00  | 18  | 100  | 0.81  |
| Topical heading (650) | 429 | 26.11 | 75.13 | 635 | 38.65 | 72.57 | 454 | 27.63 | 74.92 | 125 | 7.61  | 75.30 | 1,643 | 100 | 74.08 |
| Geographic name (651) | 12  | 3.85  | 2.10  | 138 | 44.23 | 15.77 | 125 | 40.06 | 20.63 | 37  | 11.86 | 22.29 | 312 | 100  | 14.07 |
| All Headings      | 571 | 25.74 | 9.45%  | 875 | 39.45 | 15.77 | 606 | 27.32 | 10.04 | 166 | 7.49% | 100%  | 2,218 | 100% | 100%  |

| TABLE 2  |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | Topical         | Form            | Period          | Geog            | All             |
|                | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. | No. | % Row | % Col. |
| Personal name (600) | 60  | 57.69 | 5.59  | 37  | 35.58 | 7.23  | 1   | 0.96  | 0.55  | 6   | 5.77  | 0.72  | 104 | 100  | 4.00  |
| Corporate name (610) | 37  | 64.91 | 3.44  | 15  | 26.32 | 2.93  | 1   | 1.75  | 0.55  | 4   | 7.02  | 0.48  | 57  | 100  | 2.19  |
| Uniform title (630) | 7   | 77.78 | 0.65  | 2   | 22.22 | 0.39  | 0   | 0.00  | 0.00  | 0   | 0.00  | 0.00  | 9   | 100  | 0.35  |
| Topical heading (650) | 659 | 34.15 | 61.36 | 357 | 20.05 | 75.58 | 85  | 4.40  | 47.23 | 799 | 41.40 | 95.69 | 1,930 | 100 | 74.20 |
| Geographic name (651) | 311 | 62.08 | 28.96 | 71  | 14.17 | 13.87 | 93  | 18.56 | 51.67 | 26  | 5.19  | 3.11  | 501 | 100  | 19.26 |
| All Headings      | 1,074 | 41.29% | 512 | 19.69% | 180 | 6.92% | 815 | 32.10% | 2,601 | 100% | 100% | 100% | 100% | 100% |
• Pictorial works
• Poetry
• Popular works
• Problems, exercises, etc.
• Sources
• Study guides
• Texts

Most (61%) topical subdivisions are appended to topical headings. Of those topical subdivisions that are not appended to topical headings, 75% are appended to geographic name headings. Likewise, most (76%) form subdivisions are appended to topical headings, and of those that are not, 57% are appended to geographic name headings. Period subdivisions, on the other hand, appear with nearly equal frequencies in topical headings and geographic name headings. This finding differs dramatically from those of O’Neill and Aluri (1981, 75), who found that period subdivisions occurred most frequently in geographic name headings. Geographic subdivisions seldom appear in headings other than topical headings; in fact, 96% of the geographic subdivisions in the sample are appended to topical headings.

**FREE FLOATING SUBDIVISIONS**

LCSH has two basic types of free-floating subdivisions: those that are generally applicable under all or a variety of headings and those that are applicable only under specific types of headings.

Subdivisions of the first type are enumerated in the SCM on a list of “form and topical subdivisions of general application.” The list contains more than 300 free-floating form and topical subdivisions that may be assigned by the cataloger without creating an authority record for the combination. The list includes general free-floating form subdivisions and those topical subdivisions that can be applied generally or that have an application not covered by, for example, the pattern list on which they also appear. This list governs the application of subdivisions such as —Bibliography, —Congress, —Exhibitions, —History, and —Planning. Subdivisions that can be appended only to specific types of headings are enumerated on forty different lists in the SCM. The category includes subdivisions used under headings for classes of persons and ethnic groups; subdivisions used under headings for names of individual persons, corporate bodies, and families; subdivisions used under headings for names of places and bodies of water; and subdivisions controlled by pattern headings. Subdivisions controlled by pattern headings are subdivisions that may be applied on a free-floating basis to headings belonging to one of thirty-two categories such as sports (Football, Snowshoes and snowshoeing), wars (World War, 1939–1945, United States—History—Civil War 1861–1865) and legal topics (Labor laws and legislation).

Although all headings in the LC subject...
headings system can potentially be subdivided by subdivisions enumerated on the general list of free-floating subdivisions (H 1095), fully 50% of the headings in the sample belong to one of the aforementioned categories of headings with an established set of applicable, free-floating subdivisions. Of the topical headings in the sample, fully one-third (33%) belong to a category of headings for which pattern and free-floating lists of subdivisions exist. An additional source of subdivisions is the May Subd Geog rule that identifies those headings and heading-subdivision combinations that may be subdivided further by place. Seventy-four percent of the topical headings in the sample can be subdivided further by place. A final source of subdivisions is LCSH itself, although it has already been pointed out that only a fraction of all possible heading-subdivision combinations are enumerated in LCSH.

The sources of subdivisions for all headings in the sample and for topical headings only are illustrated in tables 3 and 4, respectively. More than half (55%) of all subdivided headings in the sample include subdivisions found on the general list of free-floating subdivisions (H 1095). In fact, almost 60% of the topical headings alone contain subdivisions from this list, which governs the assignment of subdivisions such as —Bibliography, —Biography, —Congresses, —Exhibitions, and —Juvenile literature. These particular subdivisions are the most frequently assigned of the form subdivisions in the sample.

Forty-four percent of all subdivided headings in the sample contain subdivisions derived from various pattern and free-floating lists. The percentage of subdivided topical headings for which the pattern and free-floating lists are a contributing source of subdivisions is smaller (30%) because only one-third (33%) of the topical headings in the sample belong to a category of headings for which pattern and free-floating lists are applicable. Subdivisions found on these lists are free-floating, although their usage is restricted to headings that belong to a particular category. Subdivisions of this type in the sample came most frequently from the lists for names of places, classes of persons, literatures, names of persons, languages, and individual literary authors.

### TABLE 3

**Sources of Subdivisions**

<table>
<thead>
<tr>
<th></th>
<th>LCSH 13</th>
<th></th>
<th>May Subd Geog</th>
<th></th>
<th>General (H 1095)</th>
<th></th>
<th>Pattern Lists</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>487</td>
<td>29.57</td>
<td>696</td>
<td>42.26</td>
<td>911</td>
<td>55.31</td>
<td>726</td>
<td>44.08</td>
</tr>
<tr>
<td>No</td>
<td>972</td>
<td>59.02</td>
<td>951</td>
<td>57.74</td>
<td>736</td>
<td>44.69</td>
<td>194</td>
<td>11.78</td>
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<tr>
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<td>188</td>
<td>11.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,647</td>
<td>100.00</td>
<td>1,647</td>
<td>100.00</td>
<td>1,647</td>
<td>100.00</td>
<td>1,647</td>
<td>100.00</td>
</tr>
</tbody>
</table>

### TABLE 4

**Sources of Subdivisions**

<table>
<thead>
<tr>
<th></th>
<th>LCSH 13</th>
<th></th>
<th>May Subd Geog</th>
<th></th>
<th>General (H 1095)</th>
<th></th>
<th>Pattern Lists</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>357</td>
<td>29.41</td>
<td>662</td>
<td>54.53</td>
<td>720</td>
<td>59.31</td>
<td>364</td>
<td>29.98</td>
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<tr>
<td>No</td>
<td>849</td>
<td>69.93</td>
<td>552</td>
<td>45.47</td>
<td>494</td>
<td>40.69</td>
<td>123</td>
<td>10.13</td>
</tr>
<tr>
<td>N/A</td>
<td>8</td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,214</td>
<td>100.00</td>
<td>1,214</td>
<td>100.00</td>
<td>1,214</td>
<td>100.00</td>
<td>1,214</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Forty-two percent of the subdivided headings include geographic subdivisions. The *May Subd Geog* rule is applied most frequently with topical headings, as 55% of the subdivided topical headings in the sample include geographic subdivisions.

Only 30% of the subdivided headings in the sample contain subdivisions that are printed in *LCSH*. Similarly, 29% of the subdivided topical headings contain subdivisions that are printed in *LCSH*. In fact, only 7% of the subdivided topical headings in the sample include subdivisions for which *LCSH* is the only source. In other words, 93% of the subdivided topical headings in the sample could be constructed without consulting the thirteenth edition of *LCSH* for possible subdivisions.

Of those headings for which information printed in *LCSH* is necessary for the cataloger to construct the heading, almost one-third (31%) are for dates under art, literature, and music headings. Another large percentage (17%) of the cases in which *LCSH* is necessary to construct the string is for the subdivision — *Law and legislation*, which is free-floating only under certain types of headings.

**SUMMARY**

Most of the subject headings assigned by LC catalogers to current monographic works are subdivided topical headings. Forty-one percent of the subdivisions appended to subject headings are topical; 32% are geographic; and 20% are form. Although period subdivisions represent only 7% of the subdivisions appended to subject headings, they appear with nearly equal frequencies in topical and geographic subject headings. This finding differs dramatically with that of O'Neill and Aluri in part because the free-floating subdivisions — *History*—16th, 17th, 18th, 19th, or 20th century were not widely assigned at the time of their study (1979).

Library of Congress catalogers rely heavily on the system of free-floating subdivisions to construct subject headings. Fully 50% of the headings in the sample belong to one of forty categories of headings with an established set of applicable, free-floating subdivisions. In fact, 93% of the headings in the sample are constructed according to rules and not according to specific authorization in *LCSH*.

Library of Congress catalogers currently assign an average of 1.2 subdivisions per subject heading. When O'Neill and Aluri found that LC catalogers assigned an average of 0.93 subdivisions per subject heading and catalogers from member libraries assigned an average of 0.73 subdivisions per subject heading, the researchers explained the difference by pointing out that the large size of the LC collections might warrant a greater need to differentiate among subject headings (O'Neill and Aluri 1981, 77–78). Another explanation, however, could well be that catalogers outside LC do not understand the system as well as LC catalogers and, therefore, do not assign subdivisions as frequently. In fact, a more recent study by Chan demonstrates that a main area of variation in subject cataloging between LC and non-LC cataloging records is in the application of subdivisions (Chan 1989, 354–55).

**DISCUSSION**

The most obvious conclusion that can be drawn from the findings of this study is that the subject cataloging process is largely rule-based. As a direct result of the 1974 decision that, in the future, subdivisions would be appended to headings according to rules rather than according to specific authorization, catalogers at LC rely heavily on the system of free-floating subdivisions to construct subject headings. In other words, the future is here. It is a complicated future, however, and in many respects we are not ready for it.

Catalogers outside LC are not comfortable with the system of rules governing the construction of LC subject headings. Although the *SCM* contains a wealth of information, because it is a guide for LC catalogers, it is not always understood by catalogers who do not have firsthand knowledge of LC practice. In fact, even for those catalogers who, because of their participation in the National Coordinated Cataloging Program (NCCP), receive training at LC, subject subdivisions represent one of
the most difficult aspects of the bibliographic record.

Systems staff cannot always validate assigned headings. The limitations of the subject authority file, coupled with the wide variety of heading-subdivision combinations assigned to bibliographic records, make machine-validation a difficult if not impossible task. Some systems staff have, for example, created machine-readable subdivision records to verify frequently occurring heading-subdivision combinations (Ludy 1985; Miller 1984).

Reference librarians, who must bear the burden of deciphering LCSH for catalog users, do not always understand the system. Tools such as the SCM and even Free-floating Subdivisions: An Alphabetical Index are of limited usefulness to reference librarians. They might be better served by, for example, a publication similar to the now-outdated Guide to Subdivision Practice, which provided in one slim volume extensive usage guidelines, scope notes, and examples. Users probably do not know, for example, that some subdivisions are part of patterns they might be able to use for comprehensive searching of several headings in a category.

Much has been done to address these problems. Chan, who made the point that some of the variations between LC catalog records and those created by other libraries could be lessened by better external communication of LC cataloging policies, has recorded the principles that currently govern the construction and application of LC subject headings (Chan 1990a). Chan’s is the first such policy statement and is intended to provide an introduction to the system for those who do not apply it and to highlight its major features for those who do. The document includes references to the Subject Cataloging Manual and to LCSH.

As a direct result of the NCCP experience and with the support of the Council on Library Resources, LC convened a large group of experts to address subdivision practice in the LC subject headings system. Six specific recommendations emerged from the conference, all of which are aimed at easing the task of constructing subject headings (Conway, 1992). The conference participants made a general request to LC to “simplify subdivisions.” Specifically, the first recommendation suggests a prescribed order of subdivisions in topical subject heading strings. It is clear from the variety of heading patterns in the sample that many subject headings assigned to bibliographic records do not conform to the recommended order. If changes to existing headings are to be made, the task will be complicated in particular by the fact that the $a$ field contains both topical and form subdivisions. Projections based on the list of form subdivisions indicate that at least 37% of the $a$ fields in topical subject heading strings are likely to contain form subdivisions.

The second recommendation, in which conference participants requested that the authority file include records for topical heading-topical subdivision combinations, signals a major departure from current policy and the free-floating system on which LC catalogers depend. Projections based on the results of this study indicate that the number of combinations for which authority records do not exist is daunting. The recommendation suggests, however, that coded authority records for headings (pattern headings) and subdivisions (free-floating subdivisions) could be useful in creating the authority file. Findings from this study suggest that, indeed, a significant portion of topical subject headings belongs to a category of headings for which an established array of applicable subdivisions exists. The feasibility of creating an authority file based on coded records for topical headings and topical subdivisions could be determined in part by employing the methodology developed for this study to estimate the number of topical headings in the authority file that belong to one of the categories of pattern headings. Although specific implementation decisions are still under consideration at LC, where a study is underway to assess the implications of building and maintaining a national authority file as proposed in the recommendation, the conference and its recommendations represent considerable progress toward the goal of making the system more cataloger-friendly.
Yet much remains to be done. Neither our computer systems nor our cataloging tools are geared for the rule-based system they are intended to serve. Current validation techniques, for example, rely on a one-to-one character match and are not able to validate subject headings that do not have a corresponding record in the authority file. Drabenstott (forthcoming) articulates several recommendations for enhancements to authority records to permit catalogers to transfer data from the authority file to bibliographic records and to enable online systems to validate automatically many subdivided headings. She urges systems designers to take advantage of the system of pattern headings and free-floating subdivisions.

Automatic validation, however, depends on fundamental changes to our cataloging tools. For example, although forty different categories of headings are designated by lists of free-floating subdivisions enumerated in the SCM, individual headings in LCSH are not identified as belonging to a particular category. The cataloger is left to remember, for example, that Librarians and Football—Coaches are headings denoting classes of persons and therefore have an entire array of applicable subdivisions. Headings such as Publishers and publishing are even more problematic because, even if the cataloger is knowledgeable about the pattern headings system, he or she is at a loss to know whether the heading denotes a class of persons or an industry. In other words, only one part of the system—the subdivisions—is actually developed in an increasingly cumbersome body of cataloging tools.

One possible solution to the growing unwieldiness of cataloging tools such as the SCM and LCSH is the development of an online, interactive cataloger's workstation such as the one in a project underway at OCLC (Vizine-Goetz 1989). The Cataloger's Assistant is a prototype system for supporting the subject cataloging function in libraries. The system provides access to the Dewey Decimal Classification, LCSH, and cataloging data from the OCLC Online Union Catalog. The Cataloger's Assistant represents a major step in the right direction, although its usefulness to catalogers would be greatly enhanced by the availability of machine-readable authority records for subdivisions.

Attempts to ease the task of constructing LC subject headings must take into account the fundamental characteristics of the system. One very important characteristic is its dependence on an elaborate scheme of more than 3,500 free-floating subdivisions. The effectiveness of the system, however, largely depends on the degree to which it can be incorporated into current and future applications of information technology.

**Works Cited**


Holley, Robert P., and Robert E. Killheffer. 1982. Is there an answer to the subject
access crisis? *Cataloging and classification quarterly* 1, nos.2/3:125–33.


Duplicate records in the Online Union Catalog of the OCLC Online Computer Library Center, Inc., were analyzed. Bibliographic elements comprise information found in one or more fields of a bibliographic record; e.g., the author element comprises the main and added author entry fields. Bibliographic element mismatches in duplicate record pairs were considered relative to the number of records in which each element was present. When a single element differed in a duplicate record pair, that element was most often publication date. This finding shows that a difference in the date of publication is not a reliable indicator of bibliographic uniqueness. General cataloging and data entry patterns such as variations in title transcription and form of name, typographical errors, mistagged fields, misplaced subfield codes, omissions, and inconsistencies between fixed and variable fields often caused records that were duplicates to appear different. These factors can make it extremely difficult for catalogers to retrieve existing bibliographic records and thus avoid creating duplicate records. They also prevent duplicate detection algorithms used for tape-loading records from achieving desired results. An awareness of particularly problematic bibliographic elements and general factors contributing to the creation of duplicate records should help catalogers identify and accept existing records more often. This awareness should also help to direct system designers in their development of more sensitive algorithms to be used for tape loading. The resulting general reduction in the number of duplicate records in union catalogs will be a major step toward increased cataloger productivity, user satisfaction, and overall online database quality.

DEFINITION AND STATEMENT OF PROBLEM

Duplicate records that are identical are rare and easy to identify in union catalogs. As Hunstad (1988, 246) notes when discussing the problem of duplicates:

A procedure that matches two bibliographic

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descriptions byte by byte, and says yes, when all bytes match in number and in kind, and no when any slight difference occurs, will be simple enough to make, but will not fight actual duplication in a database.

It is the duplicate records that are similar but not identical that are hard to identify. Duplicate record studies and detection processes are useful only if they focus on these similar records. Duplicate records in the Online Union Catalog of the OCLC Online Computer Library Center, Inc., originate from batch loading of bibliographic records and from online cataloging. In a shared cataloging database, changes in cataloging rules and variations in cataloging practices can result in significantly different records for the same bibliographic item. In the case of batch loading, duplicate records are created when variations between the records being loaded and the corresponding records in the database prevent the system from identifying the duplicates. Duplicate records are created through online cataloging when a cataloger does not find the existing database record or does not recognize it as representing the item to be cataloged.

Failure to find an existing record can be due to inability or unwillingness to thoroughly search the database. Derived keys may be inadequate to retrieve an existing record. Improper searching techniques or errors in a bibliographic record can also prevent retrieval. Failure to recognize a record as representing the item to be cataloged can occur when the record includes more, less, or different information than appears on the item. This situation often results from a lack of uniformity among publishers in the use of publication date, printing date, and edition statements.

Duplicate records in online shared catalogs reduce efficiency in proportion to the actual number of records in the database. The greater the number of duplicate records online, the more difficult it is to search the database and to make cataloging decisions. Duplicate records also have an impact on library automation cost-effectiveness through indirect expenditures of time (e.g., searches and redundant cataloging) and direct expenditures of fees (e.g., searches; interlibrary loan; and EPIC, OCLC’s online reference service).

**Duplicate Record Sample**

A random sample from the Online Union Catalog was used to characterize duplicate records. The sample was formed by randomly generating OCLC control numbers. When the randomly generated numbers matched a bibliographic record for a book (bibliographic level = m, type of record = a), the record was included in the sample. Professional catalogers then manually searched the Online Union Catalog to identify as many potential duplicates as possible for each record in the sample. Automated searching techniques, developed to identify duplicate records in the Online Union Catalog were also used to identify additional potential duplicate records (Campbell 1991, 24). The results of both the manual and automated searches were combined into a single set of possible duplicates.

Thirteen specific bibliographic elements were used as a means of identifying and analyzing variations to determine record duplication. The elements used for this study included title, author, media (i.e., microreproduction or photocopy), date, control numbers (International Standard Book Number [ISBN], Library of Congress Card Number [LCCN], and Government Documents Control Number [GDCN]), statement of responsibility, edition, publisher, pages, size, and series. The use of elements rather than specific fields is an important distinction: Elements are descriptive of a like kind of information about a book and may include data found in more than one fixed or variable field of a bibliographic record. For example, the media element combines data from the fixed field Repr (form of reproduction) as well as the variable fields 007 (physical description), 500 (general note), and 533 (reproduction note).

Each pair of potential duplicates was evaluated by three to seven professional catalogers. Records were classified as either duplicates, nonduplicates, or unknown, pending physical examination of the books they represented. More than
one hundred of these unknown duplicates were obtained through interlibrary loan and reviewed physically. The result of all of these evaluations yielded the 742 confirmed duplicate record pairs analyzed in this study. All of the examples in this paper were taken from the 742 duplicate records pairs.

Because the sample was derived solely from the Online Union Catalog, no statistical basis exists for extrapolating to union catalogs in general. However, the types of problems observed in this study are likely to be found in other union catalogs.

**GENERAL CHARACTERISTICS OF DUPLICATE RECORDS**

A review of the confirmed duplicate records identified several general cataloging and data entry factors that contribute to duplication in the Online Union Catalog. These factors include (1) typographical errors, (2) erroneous tags and subfield codes, (3) omitted information, and (4) inconsistencies between the variable and fixed fields. Examples of these and other characteristics of duplicate records are included below and are reproduced exactly as they appeared on catalog records in the Online Union Catalog. Consequently, the examples might not reflect correct cataloging or the application of current rules and standards.

**TYPOGRAPHICAL ERRORS**

Typographical errors were found throughout the sample of duplicates. Although the error rate was relatively low, typographical errors in critical elements such as author, title, or control number can make it difficult to retrieve records.

As addressed within this study, transcription errors included spelling and transcription errors, as well as keying errors. Differences in capitalization, spacing, punctuation, and diacritic usage were not considered significant and were not counted as typographical errors.

Most typographical errors were one-character differences, e.g., the substitution of c for s in the title:

*The great school bus controversy*

or the addition of an i in the publisher:

*Macmillan*

*Macmillian*

In another example, *unlawful* was dropped from the title:

*Investigation of arson, and other unlawful burnings*

*Investigation of arson and other burnings*

While typographical errors were found in all fields, they were most common in the longer textual fields, particularly author, title, and publisher.

**ERROUS TAGS AND SUBFIELD CODES**

Mistagged fields and erroneous or misplaced subfield codes were another common problem. Some examples included (a) an author transformed into a subject by tagging the field 600 rather than 700, (b) statements of responsibility coded as subtitles, and (c) publishers coded as the place of publication. The title entry

*The Federalist or the new constitution*

by Alexander Hamilton, James Madison & John Jay

is a good example. That particular title was found with a ±b subfield code following *The Federalist* but without a ±c subfield code, creating the subtitle

*or the new constitution by Alexander Hamilton*

Erroneous or misplaced subfield codes often result in fields that algorithmically contain different information even when the contents of the fields are otherwise identical.

**OMITTED INFORMATION**

Initially, catalogers reviewing potential duplicate records tended to be conservative and to assume that information not present on a bibliographic record was not present on the book it represented. For example, if one record included a series statement and a potential duplicate record did not, the omission was initially thought to be an indication that different editions of the title had been published. However, as more records were reviewed—particularly those that were paired with multiple
potential duplicates—after examining the actual books, it became increasingly clear that omitted information usually was not significant. Omitted information was not limited to less-than-full-level records. Less-than-full-level records were not significantly more likely to be duplicates than were full-level records.

Analysis of duplicate record pairs in the sample showed that the omission of title information, author entries, edition statements, secondary publishers or distributors, and series statements did not necessarily mean that this information was not on the piece. In fact, in many cases the element was present, but some catalogers were more selective than others in deciding what to include in the bibliographic description, even when information appeared on the title page. These inconsistencies undoubtedly reflect differing local needs and a practice of including in the record only those elements of the description considered important for local use.

INCONSISTENCIES BETWEEN THE VARIABLE AND FIXED FIELDS

Fixed fields were included in the Machine-Readable Cataloging (MARC) record to ease automated processing, and in fact, most duplicate detection algorithms rely on the use of fixed fields for this reason. However, reliance on algorithms of fixed fields and their exclusion of the use of variable fields limit their accuracy in identifying duplicate records. This primary use of fixed fields also assumes greater reliability in the fixed fields. This is not necessarily the case, even though fixed fields contain simple encoded information. In fact, variable fields can provide more reliability because they contain the originating information; i.e., fixed fields contain a coded version of free-text information from the variable fields. Because the fixed fields do not contain original source information, they present a chance for error in encoding information and little, if any, chance for automatic correction. A one-character typographic error in a fixed field results in an immediate mismatch between potential duplicate records. For example, in one of the duplicate record pairs, the country of publication code did not match because one record had Connecticut coded correctly as conu, but the other record had it coded as conn.

Because variable fields are free-text, they provide for some natural redundancy within themselves. Differences can be considered within the context of surrounding letters or words and do not necessarily result in mismatches, especially with manual review. For example, in one duplicate pair, country of publication information differed between the variable fields (260 a subfield) but not between the fixed fields. The first record identified the place of publication as Allahabad while the second record had Allahabad (India). While Allahabad and Allahabad (India) would certainly be recognized as equivalent during a manual review, developing software with the ability to recognize these as the same information is difficult. Comparing the three-character code in the fixed field is, by contrast, straightforward.

The most common inconsistency in the form of reproduction code in the fixed field of potential duplicate records was leaving the code blank even when there was a clear indication in the variable fields that the monograph was a microform. Because a blank value in this field has meaning and, in fact, is the default value, it may represent a purposeful selection (meaning the item is not a reproduction), a miscoding, or an omission. Therefore, data from the variable fields (e.g., 533) were included in the media element to improve the accuracy of distinguishing records for reproductions from records for the originals.

While fixed fields are easier to use for computer matching and standardization of information, the likelihood of critical, unforgiving errors requires that the fixed fields be used in conjunction with variable fields if duplicates are to be reliably identified. When variable fields express the same information in different ways (e.g., place of publication), fixed fields can be used to obtain the record match. If the fixed fields do not match, variable fields can be checked so that errors in fixed fields become less crucial.
NOTES FIELDS

During manual review, information in the general notes fields of potential duplicate records often provided the clearest indication of whether records were duplicates. In one potential duplicate record, changes in the content of an item distinguishing it from an earlier edition were described in a note, although the record lacked a formal edition statement. In other examples, indications that a record represented a reproduction and not the original were included in a general note rather than in designated areas; e.g., fixed fields, reproduction note. A quoted note in one record often contained information found in a subtitle or series statement in another record.

According to the Anglo-American Cataloguing Rules, 2d ed., 1988 revision (AACR2R), "Notes contain useful descriptive information that cannot be fitted into other areas of the description" (Gorman and Winkler 1988, 50). Because notes are entered in free form, however, their usefulness in duplication detection processes is generally limited.

BIBLIOGRAPHIC CHARACTERISTICS OF DUPLICATE RECORDS

In addition to general factors such as typographical errors, erroneous tags/subfield codes, omissions, and fixed/variable field inconsistencies, each of the thirteen bibliographic elements used to evaluate potential duplicate records had its own unique problems. These problems could be attributed to changing cataloging rules, differing interpretations of the rules, local practice, or simply misinterpretation.

As indicated in figure 1, duplicate pairs frequently had more than one bibliographic element that differed between the records. A total of 28% of the duplicates had two elements that were different, and another 22% had mismatches in three elements. Twenty-six percent of the duplicate pairs differed in a single bibliographic element. These differences were most frequently due to differing cataloging interpretations of descriptive information for an edition.

When looking at duplicates that had only one element that was different, the date, author, and publisher elements were

![Graph showing the percentage of total duplicates based on the number of different elements.]

Figure 1. Duplicate Records: Number of Elements Present.
the ones that most frequently did not match between records. When individual elements were analyzed in duplicates with more than one mismatch, the elements that differed between duplicate records, in order of frequency, were date (58%), author (33%), publisher (29%), title (23%), size (23%), pages (23%), statement of responsibility (19%), and series (18%). Single-element and multiple-element mismatches as characteristics of duplicate records are compared in figure 2.

Key elements of the description that differentiated potential duplicate records included pagination, particularly preliminary paging (roman numerals), and statement of responsibility, especially when phrases such as *with new introduction* explained differences from other editions.

The commonality of bibliographic elements in duplicates is highlighted in figure 3. Title, media, and date elements were most frequently present in duplicates.

Least common were the control numbers, edition, and series elements.

**AUTHOR ELEMENT**

More than 30% of the duplicates had differing author entries. These differences tended to be insignificant, occurring primarily in the form of the entry or, in the case of multiple authors, the determination of which authors to include. *Settlement Patterns of the Western Hueco Bolson*, whose title page is shown in figure 4, exemplifies one of the duplicate pairs with differing author entries.

For the first record in the duplicate pair, the author entries were:

- 100 10 Whalen, Michael E.
- 710 10 United States. +b Army. +b Corps of Engineers. +b Fort Worth District

In the second record, the entries were:

- 100 10 Whalen, Michael Edward, +d 1948–700 10 Gerald, Rex E.
Figure 3. Duplicate Records: Percent of Time Field is Present.

Title Page

SETTLEMENT PATTERNS OF THE WESTERN HUECO BOLSON

BY

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HISTORIC AND NATURAL RESOURCES REPORT
U.S. ARMY, FORT BLISS
ENVIRONMENTAL OFFICE, DFAE
EL PASO, TEXAS

PUBLICATIONS IN ANTHROPOLOGY NO. 6
EL PASO CENTENNIAL MUSEUM
THE UNIVERSITY OF TEXAS AT EL PASO

JULY 1978

Figure 4. Replica of Title Page from a Duplicate Record Pair with Differing Author Entries.
The Library of Congress authority file entry for this author is Whalen, Michael E. This example is typical of the variations found in the author element in duplicate records.

Differing forms of entry are characteristic of duplicate records when the differences are in the author element. In the preceding example, one cataloger located and used the author's full name and date of birth; the other cataloger used the name as it appeared on the title page. Depending on when each of the records was created, this example might also illustrate a change in the cataloging rules concerning fullness of name in author entries. Differences in the forms of entry may also result from changes in the Library of Congress authority file.

Catalogers also have a choice as to which added entries they make. In the preceding example, one cataloger preferred the Corps of Engineers, for whom the report was prepared; the other selected Gerald, Rex E., the principal investigator.

Other author characteristics in duplicate records included authors publishing under different names (i.e., name changes, pseudonyms), differing forms of entry for corporate names, and the selection of a personal or a corporate name for the main entry rather than an added entry.

**Title and Statement of Responsibility Elements**

Consistent identification of a title and/or statement of responsibility can be difficult. Aside from the typographical and subfield coding errors discussed previously in this paper, one of the most common problems found in duplicate records is different interpretations of what constitutes the title and how to transcribe it. In the following four examples, the second title is fuller than the first; thus, the titles did not match in duplicate record pairs.

1. *Swedish Catalogue*
   *Swedish Catalogue; International Exhibition, 1876*

2. *Guide to Company Balance Sheets and Profit Loss Accounts*
   *Guide to Company Balance Sheets and Profit Loss Accounts, for Directors, Secretaries, Accountants, Bankers, Investors, and Students*

3. *The Resistance to Impact of Spent Magnox Fuel Transport Flasks*
   *The Resistance to Impact of Spent Magnox Fuel Transport Flasks: Papers Presented at a Seminar Held at the Institution of Mechanical Engineers on 30 April and 1 May 1985*

4. *Calculus Made Easy: Being a Very Simplest Introduction to... the Differential Calculus and the Integral Calculus*
   *Calculus Made Easy: Being a Very Simplest Introduction to Those Beautiful Methods of Reckoning Which Are Generally Called by the Terrifying Names of the Differential Calculus and the Integral Calculus*

In the fourth example, text was omitted from the middle of the title and replaced with ellipses.

In other cases, even the beginnings of titles were different. For example,

*Do Not Go Gentle into That Good Night*
*CBS Playhouse Presents, Do Not Go Gentle into That Good Night*

Or, as in the following example, the position of the date within the title varied:

*Scott 1990 Standard Postage Stamp Catalogue*
*Scott Standard Postage Stamp Catalogue, 1990*

Differences in the title were found in more than 20% of the duplicate records. Because the title is a primary element in any catalog record, title variations pose significant problems. Of the duplicate records with differing titles, 40% had shortened titles; 30% had typographical errors in titles; and 30% had a variety of differences, including both a shortened title and typographical errors in the same duplicate pair.

Differences in the statement of responsibility also were significant, occurring in 19% of the duplicates. In addition to typographical errors, the most common inconsistencies in the statement of responsibility were due to the omission of the statement of responsibility or problems identifying the end of the statement of responsibility.
Jones and Kastner (1983) identified the difficulty of distinguishing printings and editions of a given monographic title as a major factor that contributed to adding duplicate records to union catalogs. This observation is empirically confirmed by data collected in this study relative to the edition and date elements in the duplicate records.

Publication date was the only difference in 8% of the duplicates; another 50% differed in publication date and at least one other element. Of all the potential duplicates that differed only in publication date, only one represented different editions. The edition element was present in less than 20% of the duplicate records. Of those duplicate records that included edition statements, 4% differed solely because of mismatching edition statements; 64% differed by edition and at least one other element.

Jones and Kastner provide a detailed description of the problems and considerations associated with the cataloger's need to distinguish between editions and printings. They discuss the historic eras of printing technology—hand press, machine press, and computerized printing—and emphasize the impact on cataloging. Technology has forced catalogers to distinguish between printings and editions for 19th and 20th century imprints (i.e., those produced after the hand press era).

As Jones and Kastner point out, confusion about what constitutes a different edition primarily derives from a "lack of uniformity among publishers in the use of the terms 'edition' and 'impression' or 'printing' and their equivalents in other languages" (1983, 213). Cataloging rules have acknowledged this ambiguity but still have supported the inclusion of distinguishing information in the catalog record whenever there is any doubt that the item in hand represents a distinct edition. Rules concerning publication date have added to the confusion.

One of the more prominent examples of duplicate records resulting from confusion related to editions and printings is An Economic Interpretation of the Constitution of the United States, title pages of which are shown in figure 5.

These are different printings of the same edition, with the later date representing a printing date (16th printing in 1959). Only one mismatched element (publication date) occurred in the records for these two items. The items represented were borrowed through interlibrary loan for physical examination, and the records were found to be duplicates. The Online Union Catalog contained 24 records representing two distinct editions of this title.

By the time Jones and Kastner wrote their article in 1983, a Library of Congress rule interpretation (LCRI) "clarified the cataloging rules in the direction of avoidance of duplication of records" (Jones and Kastner 1983, 216). This trend has continued. The LCRI for rule 1.2B4 (Library of Congress 1989) stresses that the cataloger should not supply an edition statement when one is lacking, unless differences from other editions are "manifest." The LCRI for rule 1.4C4 (Library of Congress 1989) specifically notes that the goal is for one bibliographic record to stand for all impressions.

When an edition statement on a piece to be cataloged differs from the edition statement on an existing catalog record, the cataloger must decide whether the item really represents a distinct edition or simply another printing. Rule 1.2B3 in AACR2R says "In case of doubt about whether a statement is an edition statement take the presence of such words as edition, issue, version, (or their equivalents in other languages) as evidence that such a statement is an edition statement" (Gorman and Winkler 1988, 30). Unfortunately, a piece that claims to be an edition often is not, particularly in the case of romance language publications.

When there is no edition statement on a piece to be cataloged and the date on the item differs from the date on an existing catalog record, the piece could be either...
another printing or a new edition. Although the cataloging rules describe in detail how to transcribe publication, copyright, and manufacturing dates found in an item, they do not indicate how to decide whether an undesignated date is a publication or printing date. The results of this study indicate that, in the overwhelming majority of cases, an item is just another printing when the date is the only difference.

Historic periods represented by date entries also characterize duplicate records. Duplicate records with publication dates prior to 1969 were three times more likely to have mismatches in the date field than those records with date entries after 1969. The decrease in the number of differences with imprint dates after 1969 correlates with the introduction of the use of ISBNs, which made matching of records in automated databases easier.

CONTROL NUMBER ELEMENTS

Fields containing the control numbers—ISBN, LCCN, and GDCN—are the most reliable variable fields. When records contain matching control numbers and have other similarities, they are usually duplicates; when they contain different numbers, they rarely are duplicates.

Errors can and do occur in control numbers; no information is immune from typographical errors. Errors in the ISBN can usually be detected because the number contains a check digit. Only one pair of duplicate records in the sample was found with differing but valid ISBNs. In that case, the book carried two ISBNs—one for hardback and one for paperback editions.

PUBLISHER ELEMENT

Considerable variation in publisher names characterizes duplicate records. AACR2R (1.4D2) states that the publisher’s name should be given “in the shortest form in which it can be understood and identified internationally” (Gorman and Winkler 1988, 37). Because there is no authority file for publisher names, it is impossible to achieve consistent results when applying this rule. Minor variations, e.g.,

Thomas B. Mosher
T.B. Mosher

are relatively common. Other publisher names are frequently shortened by abbreviation. For example:
For international databases, an additional requirement of AACR2R (1.4D5) was to add a subsequently named publisher if that publisher was located "in the home country of the cataloguing agency and the first named publisher ... is not" (Gorman and Winkler 1988, 38). While the logic is clear, the result is that the publisher statement is based not only on the properties of the item cataloged but also on the location of the cataloger. The publisher entries London: J. M. Dent; New York: E. P. Dutton and simply London: Dent are both correct, but they result from differing practices in American and British cataloging agencies, respectively.

In 1990, the Library of Congress issued a rule interpretation that eliminated the need to consider the location of the cataloger when recording publisher information. The LCRI calls for the inclusion of the names of all publishers on the chief source (Library of Congress 1989, 1.4D5): "Record the names of all publishers appearing on the chief source of information of the edition being cataloged. . . . Record also the name of a U.S. publisher appearing anywhere on the item when a non-U.S. publisher appears on the chief source."

Publisher statements also vary in the degree to which words or phrases indicating the function performed are retained. One duplicate record in the sample contained Printed for R. Banks in the publisher area, while the other contained only the name R. Banks.

In some instances, it is difficult to distinguish among the author, publisher, printer, distributor, etc., resulting in another significant source of variation. The duplicate records pair for Settlement Patterns of the Western Hueco Bolson exemplifies this problem. In one of the records, the publisher was identified as El Paso Centennial Museum, University of Texas; in the other record, the publisher was identified, in brackets, as Texas Western Press.

The publisher is a key to determining whether two different records represent distinct editions. When a title is published by a different publisher, it is considered to be a distinct edition. A total of 29% of the duplicates in the sample were characterized by different publisher entries, posing a significant problem in identifying records as duplicates.

**Series Element**

The most common variations found in series entries were (1) series information was omitted from one of the records, (2) the format of the information was different, and (3) the information was recorded in different fields.

Differences frequently occurred when catalogers had to determine what was a series statement or whether a series statement was significant enough to include in the record. One book published by Charles Scribner’s Sons included the Pagurian Press logo—a scorpion surrounded by a ring with the phrase “A PAGURIAN PRESS BOOK”—on the verso. One of the duplicate records for this item included the untraced series A Pagurian Press book, while the other record did not have a series statement. This omission of series information in duplicates was the most frequent difference observed for series, accounting for approximately 60% of the differences in duplicates involving series.

Even when both records contained series fields, the format of the information often differed. The following series statements taken from records in the Online Union Catalog describe the same item, although the manner in which the information is presented is very different (and not necessarily correct).

*Journal of the Royal Society of Medicine. Supplement, sxx 0267-5331; sv no. 12 (1986)*

*Journal of the Royal Society of Medicine, sxx 0267-5331; sv v. 79, suppl. no. 12*

While these series statements can be recognized as equivalent with little difficulty during a manual review, the differences are difficult to overcome algorithmically.

The MARC format has nine different fields in which series information can be found. The asterisk (*) denotes pre-AACR2 forms.
400* Personal name/title series statement (traced the same) 
410* Corporate name/title series statement (traced the same) 
411* Conference or meeting name/title series statement (traced the same) 
440 Title series statement (traced the same) 
490 Series statement not traced or traced differently 
800 Personal name/title series added entry 
810 Corporate name/title series added entry 
811 Conference or meeting name/title series added entry 
830 Uniform title series added entry

This variety causes significant matching problems, particularly between pre- and post-AACR2 forms. The duplicate records for Innovation and Change in Reading Instruction, the title page of which is shown in figure 6, illustrate this problem.

One of the duplicate records for this item contained a pre-AACR2 series statement in the form:

Its +tfearbook; +v no. 67, +part II

The equivalent series information in the other duplicate record was entered as

Yearbook of the National Society for the Study of Education, +n67th, pt. 2

In addition to different entry styles, the records had different numeric styles; i.e., Roman numerals and the Arabic equivalent.

PAGE ELEMENT

The page element is a significant characteristic of duplicate records, often being one of the more reliable indicators of whether records represent the same bibliographic item. The page element was present in 98% of the duplicates. In 2% of the duplicates, the page element was the only differing element; in 21% it was one of multiple differing elements.

MEDIA ELEMENT

For the media element, the most common problem occurred when the Repr (form of reproduction) fixed field code was blank, despite a clear indication in a variable field that the item was a reproduction. The difficulty in determining the form of item from the variable fields is that the information may be in a variety of locations, including

007 physical description,
245 title statement, general material designation.

INNOVATION AND CHANGE IN READING INSTRUCTION

The Sixty-seventh Yearbook of the National Society for the Study of Education

PART II

by

THE YEARBOOK COMMITTEE

and

ASSOCIATED CONTRIBUTORS

Edited by

HELEN M. ROBINSON

Editor for the Society

HERMAN G. RICHEY

NSS E

1968

Distributed by THE UNIVERSITY OF CHICAGO PRESS

CHICAGO, ILLINOIS 60637

Figure 6. Replica of a Title Page from a Duplicate Record Pair with Differing Series Entries.
500 general notes as enhancements of the physical description.
353 photoreproduction note.

In most systems, items that have different codes in the Repr field are not identified as duplicates, even though the differences may be due to typographical errors and the variable field information may be indicative of a potential duplicate record. While only 1.5% of the duplicates identified in this study contained different codes, this type of error is difficult to detect.

Size Element
The physical size of the item was insignificant in characterizing duplicate records. Where duplicate records contained conflicting size data, the difference was generally only one or two centimeters. Minor differences in size occur because of inexact measurement, rounding errors, or binding differences.

Conclusions
This analysis of duplicate records in OCLC's Online Union Catalog demonstrates that differences between bibliographic records or between an existing record and an item to be cataloged often are not bibliographically significant. However, they often do prevent successful retrieval or matching of records, either manually or automatically. Therefore, when a bibliographic record contains minor variations from an item being cataloged, several possibilities should be considered before creating a new record. These include the possibility that the existing bibliographic record contains
1. input errors, e.g., typographical errors, or failure to change or delete fields when a new record is derived from an existing record,
2. omissions, e.g., information present on the piece may have been omitted if not needed locally,
3. different interpretations of identical information, e.g., assuming that an undesignated date is a publication rather than a printing date, or truncating a title.

Even when these possibilities are considered, it may be difficult to determine whether a record matches a piece to be cataloged. Knowing which bibliographic elements and general factors most often contribute to the creation of duplicate records should help catalogers make appropriate decisions about when to input new records. If it can be concluded that an existing record is incorrect, a change request should be submitted so that the errors may be corrected. Duplicate records should not be created on the basis of dissatisfaction with the quality of existing records. A reduction in the number of duplicate records being added to the Online Union Catalog will definitely facilitate increased cataloging productivity and end-user satisfaction, particularly with applications such as interlibrary loan and EPIC.

Works Cited
Campbell, Nancy. 1991. Database clean-up improves cataloging, ILL, and reference. OCLC newsletter no.192 (July/Aug.).
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Preservation Needs of Oversized Illustrations in Geology Master’s Theses

Sally J. Scott

Preservation of deteriorating materials in library collections is a serious concern for many libraries. Determination of the extent of preservation need is critical to eliciting support for solutions to the problem. A study to evaluate the need for preservation of the oversized pocket illustrations in geology master’s theses was conducted at the University of California, Los Angeles (UCLA). Forty-five percent of the illustrations were found to be in need of preservation. Factors contributing to their deterioration are described, and suggestions are made for preventing future problems.

Geology literature is unusual in that a high proportion of both monographs and serials include oversized illustrations, usually folded and placed in a pocket at the back of the item. Many of these illustrations are colored maps. A study of the Geology Library at Columbia University to determine preservation needs found that of the materials that were too brittle for rebinding, 3% of the monographs and 54% of the serial titles included large colored maps (Klimley 1984). These maps are usually necessary adjuncts to the comprehension of the text and are heavily used. They often are oversized and cumbersome and, being difficult to refold properly, frequently are subject to tearing and rapid deterioration.

A similar problem exists with dissertations and theses in geology. The situation is more acute in these cases, because usually only one or two original copies exist, and they probably are held only by the degree-granting institution. If the dissertation or thesis is not subsequently published, the information contained might not exist anywhere else. For instance, the maps might be the only ones in existence for a geographic area. Geology theses are more heavily used than theses in other disciplines, not only by the academic community but also by corporate borrowers such as mining and oil companies. A study at the Mines Library, University of Nevada-Reno, showed that nearly 10% of that library’s overall circulation was theses and that 16% of the interlibrary loan requests in the Main Library were for theses (Newman 1987, 5–7). Geology dissertations are also more frequently cited than those in other fields (Walcott 1988).

Copies of doctoral dissertations are

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available from University Microfilms International (UMI), but there are problems involving access and quality of reproduction. Walcott found that 7.5% of 1,864 theses examined were not available from UMI and that 22% of 628 theses searched were not indexed in GeoRef, rendering them inaccessible to users (Walcott 1988). More seriously from a geoscience user's point of view, the colored maps were filmed by UMI in black and white in pagesized pieces and bound into the text. Only by carefully removing them from the text and reassembling them could one realistically use them. Protests by the geoscience community resulted in a decision by UMI to keep a copy of the pocket maps, which they would photograph on request for an additional fee (Walcott 1988). This service became available beginning with theses offered in 1986; however, they are not reproducing them in color yet, and color is particularly important for the interpretation of geological maps. Nevertheless, in spite of the difficulties, it is possible to obtain copies of most North American and increasingly, worldwide doctoral dissertations from UMI and to identify their existence from indexed sources such as GeoRef, Dissertation Abstracts International, and American Doctoral Dissertations (Repp and Glaviano 1987).

Master's theses, however, are not generally indexed and usually are available only from the degree-granting institution. They receive heavy use, which results in extensive damage to the illustrations in the pockets. Whereas guidelines are now available for preparation of theses (Boyd and Etherington 1986), and most universities now have strict requirements, standards were not necessarily available when the older theses were produced. Illustrations frequently were not produced on high-quality paper. The maps were often blue-line ozalid prints that were hand-colored by the author, usually with colored pencils. The colors might fade with time and use and do not photocopy or photograph well, especially when similar shades are adjacent. Also, some colors do not reproduce well (Newman 1987).

The difficulty of reproducing these unique documents and the heavy use they receive make them prime candidates for preservation, including attention to both prevention and restoration. In many geology libraries this is a critical problem. The maps are an irreplaceable resource, and many have already been lost or badly damaged.

**PURPOSE OF THE STUDY**

The purpose of this study was to determine the extent of preservation need for pocket materials in the collection of master's theses in geology in the Geology/Geophysics Library at the University of California, Los Angeles, and to evaluate the factors contributing to their deterioration. There were 338 master's thesis titles in geology in the collection (excluding those in geochemistry or geophysics and space physics) dating from 1934 to 1988. A black-and-white microfilm copy of each title is kept in University Archives. The Geology/Geophysics Library keeps the original uncirculated copy in a locked case. Two or three circulating copies of each title are available in the open stacks. Oversized illustrations are contained in pockets in 260 of these titles.

**METHODOLOGY**

The original intent of the study was to evaluate the entire collection of master's theses, which would have given the geology librarian data needed to proceed with a preservation project. Time constraints, however, limited the study to 100 titles. The sample was not selected at random but rather was chosen according to convenience. Thus, the results reported here must be considered preliminary estimates and may not be generalized.

The criteria to be included in the evaluation were determined. A data sheet was designed and prepared for recording the data (Scott 1991). The shelf-list card for each title in the entire collection of master's theses was photocopied onto a data sheet, conveniently providing all relevant data on one page. A code system was developed for recording the data in an abbreviated form.

To determine the effect of use, a com-
parison needed to be made between the unused or little-used archival copy (copy 1) and the circulating copy (copy 2) of each title. Thus, 200 volumes were examined. Titles for which a second copy was unavailable were not included.

To determine the effect of time, an adequate coverage of the entire range of years was required. Using the prepared data sheets, the titles were sorted into groups of five-year periods. Each group was sorted alphabetically by author. The first ten titles that contained pocket illustrations in each group were selected. For some groups, fewer than ten titles qualified. Many theses produced during the 1930s and 1940s were missing either one or both copies. Changes in degree requirements, which provided an examination option in lieu of a master's thesis, resulted in fewer theses in the 1980s. Those that were written contained fewer large illustrations because the research emphasis shifted away from field projects. To complete the sample of 100, the remaining titles were sorted alphabetically by author, and the first 18 titles that contained pocket illustrations were selected. The chronological distribution of titles in the sample is given in table 1.

Eighteen different types of illustrations, referred to as plates, were identified, with a total of 673 pieces in all copies.

**TABLE 1**

<table>
<thead>
<tr>
<th>Date of Thesis</th>
<th>No. of Titles in Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1935-1939</td>
<td>2</td>
</tr>
<tr>
<td>1940-1944</td>
<td>2</td>
</tr>
<tr>
<td>1945-1949</td>
<td>6</td>
</tr>
<tr>
<td>1950-1954</td>
<td>11</td>
</tr>
<tr>
<td>1955-1959</td>
<td>22</td>
</tr>
<tr>
<td>1960-1964</td>
<td>15</td>
</tr>
<tr>
<td>1965-1969</td>
<td>10</td>
</tr>
<tr>
<td>1970-1974</td>
<td>10</td>
</tr>
<tr>
<td>1975-1979</td>
<td>9</td>
</tr>
<tr>
<td>1980-1984</td>
<td>10</td>
</tr>
<tr>
<td>1985-1989</td>
<td>3</td>
</tr>
</tbody>
</table>

Geologic maps comprised 31%; geologic cross sections, 25%; columnar sections, 12%; charts, including correlation charts, 7%; structure contour maps, 4%; all other types of maps combined, 8%; and all remaining plates, 13%. Seventeen plates were missing. Ten of the plates had been produced from the archival microfilm copy as replacements for missing pieces and were not included in the analysis because they did not reflect accurately the effects of time and usage on the condition of the piece.

There are two major categories of damage to paper—mechanical and chemical. Mechanical damage includes physical wear and tear and the results of the activities of rodents, insects, molds, and fungi. Chemical damage results from light, moisture, heat, air pollutants, and the acids in the paper (Capps 1973). Paper with high acid content deteriorates more rapidly than more alkaline paper. Measurement of acid content can require the application of chemicals that can stain or otherwise damage the paper, although safer methods are available (Swartzburg 1983). Britteness of paper is tested by folding back and forth the corner of a page a number of times. If the paper cracks or breaks, it indicates that it has deteriorated badly. Even if the paper does not break along the crease, a fold is left on the paper. When the intent is to preserve a unique, irreplaceable document, it would be counterproductive to damage it. Consequently, at the request of the geology librarian, chemical or fold tests were not performed. Also, no attempt was made to evaluate biological damage. Only observable wear and tear was examined.

The characteristics measured or evaluated for each plate included size, color, extent of tearing along the folds or at the edges, place and condition of previous tape repairs, and use. Missing plates were noted. An overall condition based on a scale of 0-6 was given to each plate and to each copy (see appendix A).

In general, the extent of tearing was a consistent measure of the overall condition. It was particularly relevant for the folded plates, which tended to deteriorate more rapidly along the folds. Users sometimes refolded the plates improperly, and
this added to their wear. In some situations, for example, where one larger accidental tear did not reflect the overall condition of the piece, the overall rating does not match the tear scale. The relatively large number of conditions was chosen to provide more detail in this initial study. Other researchers might obtain equally useful results using fewer categories.

Size measurement categories were based on the capacities of photocopy and microfilm equipment and included 11 by 14 inches, 17 by 22 inches, up to 24 inches on the shortest side, 24 to 30 inches, 30 to 36 inches, and 36 to 42 inches on the shortest side.

Color was the most difficult variable to measure. All of the colored plates were colored by hand, usually with colored pencils. It was not possible to assign a numerical value to the quality of the color of each plate. Although the colors were sometimes less clear in the circulating copies than in the archival copies, there was usually no measurable difference. If there was a difference, it was not possible to know whether the colorer had used more pressure on one copy than on the other or even whether the same person had colored both copies. The degree of contrast for each plate was chosen as an indicator, because it is important to the quality of the resultant photocopy or microfilmed copy and to the shading in a black-and-white copy. For example, adjacent colors of similar tone or intensity might be difficult to interpret.

For this study, high contrast defines colors that were bright, strong, and easily differentiated from each other. Low contrast colors were either pale and washed out or very similar in tone and intensity, making the plate difficult to interpret. Medium density refers either to colors that were neither very bright nor very pale or to situations where there was a mixture of high and low. Also indicated was the method used to color the plate, when it could be determined, and the presence of red, because it is a difficult color to interpret on microfilm.

The location of any tape—on the back, verso, or edge of paper—was recorded as well as whether the tape had been or could be folded and whether it was in bad or good condition. Tape in bad condition was defined as yellowed, cracked, peeling, or brittle.

Use was recorded from the circulation data in the book and included interlibrary loan use, circulation date stamps, and in-house use recorded during a use study conducted from July 1, 1987, to May 31, 1988. No information was available about other unrecorded use within the library stacks.

**RESULTS**

The data gathered were evaluated to determine the overall condition and need for preservation of each major type of plate and of the volumes as a whole. The relationships of the size of the plates to wear, the amount of use to wear, and age of thesis to wear were determined. The effects of time and use on quality of color were examined. The possibility of varying qualities of paper used during different periods was examined based on the overall condition of theses from these periods.

As defined by the parameters used to determine overall condition, plates rated 0–3 are in need of immediate preservation attention. Those rated 4 need to be periodically reevaluated and preserved at the earliest possible time. A 5- or 6-rated plate does not need preservation.

Eighty of the 200 volumes (40%) contained only plates that were rated 5 or 6; 44 (22%) contained plates rated 4; 76 (38%) contained plates rated 0–3 (see figure 1).

A total of 60% of the volumes contained plates needing immediate preservation or attention in the near future. Evaluation by copies shows that 26% of the archival copies contained plates rated 0–3, 14% rated 4, and 60% rated 5–6, resulting in 40% needing preservation. The circulating copies had 50% rated 0–3, 30% rated 4, and 20% rated 5–6, so 80% needed preservation.

Thirty-two volumes (16 titles) rated 5–6 on all plates in both copies. An examination of these titles showed that five (dating 1935–1955) had plates printed on comparatively thicker paper (acidity undetermined) or were later copies. Six (1951–1977) had low use, and five were very recent (1982–1985).
Figure 2 illustrates the number and percentages of plates in each condition.

All of the plates rating a 0 condition were geologic maps. A total of 45% of the plates needed preservation. The totals for each of the types of plates are shown in table 2.

In all categories the conditions were worse for plates in the circulating copies, all of which had circulated, suggesting that use contributes to the deterioration of the materials. Many of the archival copies had circulated occasionally but most had not, so they would not be a valid measure of use. Using only the circulating copies of those titles for which there was a complete record of use, the condition figures for the geologic maps, which are the most heavily used and valuable of the plates, were plotted against the number of uses (see figure 3).

The fact that all of the plates rating a
TABLE 2
CONDITION OF ILLUSTRATION TYPES IN UCLA GEOLOGY MASTER'S THESSES

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</table>

Condition 0 were geologic maps is not reflected in this graph, because incomplete usage data were available for the copies containing those maps. The average condition of all the plates in the same circulating copies was computed and plotted against use (see figure 4).

There appears to be a clear relationship between condition and use in both cases. Two notes of caution, however, must be considered regarding use: one, for the copies as a whole, there is no way of knowing which plates in the pocket were actually used; and two, unrecorded use within the library itself could not be measured, except during the brief use study.

Because the larger plates were unwieldy to use and difficult to refold prop-
Figure 3. Use/Average Condition Relationship for Geologic maps in Circulating Copies.

Figure 4. Use/Average Condition Relationship of All Plates in Copies Used for Figure 2.

erly, the relationship between size of the plate and its condition was examined. The numbers and percentages of plates in each size category are given in table 3, and the relationship between size and condition for the geologic maps in the circulating copies is given in table 4. In both cases, the percentage of plates in the lowest-
### TABLE 3
**Relation of Condition of Illustration to Size**

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<tr>
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<td>%</td>
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### TABLE 4
**Relation of Condition of Geologic Maps to Size for Circulating Copies**

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<td>%</td>
<td>No.</td>
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</tbody>
</table>
numbered conditions increases with size, indicating a relationship does exist. This reflects primarily the tears along the inside folds of the maps. Items in condition 0 had torn completely apart, usually along the folds.

The tabulated results were grouped by five-year periods to see whether there was any evidence of differences in quality of materials used for the plates. The results of this comparison are shown in table 5. Clearly, the older materials showed the most deterioration, which largely reflects the greater use they have had. The only period with an unexpectedly good rating is 1965–1969, with all of the archival copies in the 5–6 rating and only 3 of the circulating copies needing urgent attention. An unexpected poor showing can be seen in the data for 1980–1984, which might indicate that standards for paper requirements for illustrations have not been adopted in recent years. Two of the theses from 1983 have plates that are already seriously browning. Without chemical testing of the paper, however, it is not possible to determine whether there was any difference in the materials used at these times.

Fifty-two percent (347) of the plates were colored. Of those, 271 (78%) contained some red, which reproduces as black in a microfilm copy, making it very difficult to interpret. The number of colors used in each illustration ranged from 1 to 23. The average number used was 9.6, and the median number was 9. To determine whether the number of colors affected contrast, on the assumption that it would be more difficult to ensure clear differences between adjacent colors when more colors were needed, the data for the circulating copies was evaluated. Of 84 circulating-copy plates with fewer than 9 colors used, 21 (25%) showed high contrast, 16 (19%) medium contrast, and 47 (56%) low contrast. Of 81 plates with greater than 9 colors, 18 (22%) showed high contrast, 41 (51%) medium contrast, and 22 (27%) low contrast. The percentage of plates with low contrast was actually greater for the plates with fewer than 9 colors used, indicating that more colors did not necessarily affect contrast.

Because it had been determined that the overall condition of a plate was related to use, the plates were compared in several ways to see whether there was a relationship between condition and contrast that would indicate that use could also affect the condition of the color of the plate. Because the archival copies generally had received less use than the circulating copies, both copies of the 151 colored plates that were present in both copies were compared. Twenty-four (16%) of the plates in the archival copies were greater in contrast and three (2%) were lesser in contrast than the same plates in the circulating copies. There was no discernible difference in the remaining 125 (82%) of the pairs of plates. Where the condition of the same plate in each copy differed (128 plates), 106 (82%) showed the same contrast in both copies. There is clearly no evidence of a change in color contrast caused by use in these figures.

The condition and degree of contrast for the colored plates were then compared only in the circulating copies (see table 6). If time and use affected the condition of the color, one might expect a direct relationship between overall condition and contrast in the plates; i.e., the lower the condition, the lower the contrast. However, the reverse appears to be true for plates in conditions 3, 4, and 5. There is no clear-cut pattern for any condition and no apparent relationship between condition and contrast. There is no evidence of use affect on the plates.

Change in the color of the paper is included in condition ratings 0–5. There was no consistent relationship between the color change of the paper and the contrast measured. The browning of the underlying paper did not appear to diminish the intensity of the overlying penciled color.

Finally, all of the plates in each copy were compared to determine whether the contrast varied when the conditions of the plates varied. If the contrast was the same for differing conditions, it would show that contrast was due to coloring technique and not to time and use factors. If contrast varied between conditions, it might indicate a relationship between use and condition of color. Twenty-six archival copies had more than one colored plate. The
### TABLE 5
**CONDITION OF ILLUSTRATIONS BY FIVE-YEAR PERIODS**

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TABLE 6

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<td>5</td>
<td>11</td>
<td>23</td>
<td>28</td>
<td>9</td>
<td>-</td>
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</tbody>
</table>

plates in 14 (54%) of these copies showed the same contrast for differing conditions; 12 (46%) showed differing contrasts. Thirty-seven circulating copies had multiple plates. Twenty-one (57%) included plates with the same contrast for all and 16 (43%) with differing contrasts. None of these comparisons revealed any significant relationship between the condition of color and use. The present state of the color aspects of a plate seems to reflect the initial condition generated by the individual who colored it.

Use of ordinary pressure-sensitive tape to repair tears causes serious problems, which can be more difficult to remedy than the original tear. Tape can stain the paper, dry out, crack, and tear. Tape should be removed only by an experienced conservator (Kyle 1983). Sixty-four (7%) of the plates had been mended with tape; 46 (72%) were from 31 circulating copies and 18 (28%) from 17 archival copies, a total of 48 volumes. Fifty (78%) of those plates were in conditions 0–3, 11 (17%) in condition 4, and 3 (5%) in conditions 5–6. Most of the taped plates were geologic maps, comprising 42 (66%) of the total; 12 (19%) were cross sections; 7 (11%) were columnar sections; 2 (3%) were structure sections; and 1 (1%) was a time plot. The tape was in bad condition on 44 (69%) of the plates and in good condition on 20 (31%). The tape was located on the front of 4 (6%) of the plates, on the verso of 39 (61%) of the plates, on both sides of 16 (25%) of the plates, and on the edge of 5 (8%) of the plates. None of the ledger-size plates were taped. Five (8%) of the taped plates were portfolio size, 25 (39%) were up to 24 inches, 16 (25%) were up to 30 inches, 11 (17%) were up to 36 inches, and 7 (11%) were up to 42 inches. Some of this tape was of good quality and had held up well, but most was ordinary pressure-sensitive tape that had become brittle.

CONCLUSIONS

Geology is a visually oriented science that has relied heavily on illustrations from early in its history. It was one of the earliest sciences to employ color to encode information. Text cannot adequately describe, for example, the detailed and often complex subsurface relationships of stratigraphic formations without complementary illustrations. Some of these illustrations, such as geologic maps, are valuable as separate documents that may be used without the accompanying text. Geology illustrations also can be useful to people in other disciplines and can have potential future uses not presently recognized. Loss of these illustrations can diminish the usefulness of the work or prevent some future application of the knowledge contained there.

The pocket illustrations in the geology master's theses needed immediate preservation action in 38% of the volumes, comprising 22% of the plates. An additional 22% of the volumes, with 23% of the plates, needed attention soon. The circulating copies displayed the most immediate need because they were in constant use. The geologic maps, cross sections, and columnar sections had the highest percentage of damage of all the illustration types and were also the most likely to be hand colored.

Degree of use was determined to be the primary factor in the deterioration of these plates. Size of the plates was a factor for the large folded plates, which tended to wear along the folds. Quality of paper was
probably involved but was not measured and was not determinable by physical examination alone.

Color is often a significant factor in geologic illustrations where it is used to differentiate many varying details. For example, if each stratigraphic formation on a geologic map is a different color, the occurrence and distribution of each formation is immediately apparent. Folds, faults, non-conformities, and other structural characteristics are readily recognized by a knowledgeable user. Loss of color renders interpretation difficult if not impossible, particularly in complex geological situations.

Because of their unique value and the paucity of copies in existence, the original theses should receive conservation attention. The text and black-and-white plates could be subjected to deacidification in the most serious cases. The hand-colored plates are more problematic. Only a non-aqueous deacidification process should be used, to avoid damage to the penciled colors. Encapsulation of the colored illustrations between layers of plastic should also be avoided because particles of color can be removed by the electrostatic charge of the plastic (Swartzburg 1983). If repairs need to be made to tears, only heat-set tissue or specially formulated acid-free reversible tape should be used (Kyle 1983). At the very least, the original copy should be removed from circulation and housed in an environment controlled for light, heat, and humidity.

For a more permanent preservation of the information contained in the theses, they should be reformatted in another medium. The Joint Task Force on Text and Image, of the Commission on Preservation and Access, suggests that a mixed-media format can be advisable in some cases, particularly where the images are contained separately from the text, as is the case with the oversized pocket illustrations (Commission on Preservation and Access 1992). High-contrast black-and-white microfilming would be satisfactory for the text and black-and-white plates, with color microfilm reserved for the hand-colored plates.

Digital imaging offers the best promise for future preservation, but the technology is rapidly changing and is not yet readily available. Microfilm has been shown to have a relatively long life and later can be used to generate digital images when the technology and costs become advantageous. Electronic storage might also enable scholars of the future to manipulate the data in ways not currently possible.

Because UCLA already has a backup microfilm black-and-white copy of each thesis, the major consideration for reformatted preservation is the colored plates, which are also the most heavily used and most damaged of the plates. Following the recommendations of the Joint Task Force, the color plates should be color-microfilmed with a goal of future digital imaging. Other institutions dealing with this problem would need to consider the options for all parts of these theses.

To prevent deterioration and the need for conservation and preservation for future theses, standards and procedures for their production need to be followed. Not only the text but also the illustrations should conform to standards for paper quality, coloration, size, etc. Oversized pocket illustrations might need conservation attention in circulating copies to prevent damage. A copy in another format should be created initially. Future technological changes, such as production of theses on computer disks rather than in print, and better quality color photocopy and microfilm reproductions, should not detract from the need to protect the original documents in whatever form they are generated.

WORKS CITED
Condition | Criteria |
--- | --- |
6 = Pristine | No evidence of yellowing or other signs of damage or deterioration |
5 = Good | Paper yellowing, minor wear at folds but not torn or cracked; does not need preservation now |
4 = Moderate | Same as 5 but has minor tear on a fold or the edge, up to 1/2 inch; needs periodic rechecking; should be dealt with after more critical problems are handled |
3 = Fair | Paper yellowed, minor tears or cracks, on folds or edges, 1/2 inch to 1 inch; needs preservation |
2 = Poor | Very yellow or brown; major tears or cracks, or both, on folds or edges, 1 inch to 2 inches; needs immediate help, may be salvageable |
1 = Very Poor | As in 2 but tears greater than 2 inches |
0 = Hopeless | Literally in pieces, probably not savable |

INDEX TO ADVERTISERS

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<td>Todd Enterprises</td>
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Notes on Research

A Cataloger's Workstation: Using a NeXT Computer and Digital Librarian Software to Access the Anglo-American Cataloguing Rules

Joni Gomez

The NeXT 1.0 computer was utilized as a cataloger's workstation. The researchers evaluated the magneto-optical disk as a means of storage and evaluated Digital Librarian, the full-text indexing software for library applications. Researchers believe the NeXT computer has the potential for use as a cataloger's workstation. However, additional programming is required to give the NeXT system the flexibility and sophistication necessary to make it a viable cataloging tool.

This project involved the use of a NeXT computer as a cataloger's workstation. The NeXT computer was selected as a prototype workstation because it comes with a mass storage device—the magneto-optical disk—and bundled software packages, including Workspace Manager for managing files; Digital Librarian for capturing, indexing, and searching; and Interface Builder for creating programs. This combination of hardware and software allowed the researchers to create a database of cataloging resources, including the text of Anglo-American Cataloguing Rules, 2d edition, 1988 revision, (AACR2R), and to develop a monograph workform with pop-up menus providing machine-readable cataloging (MARC) options for creating a complete bibliographic record.

In this note the results of the initial study that evaluated the use of Digital Librarian for accessing the text of AACR2R on disk are described. The objectives were to determine whether Digital Librarian was a viable software program for full-text indexing and retrieval of AACR2R and to determine whether access with Digital Librarian software is more efficient than manual access to cataloging rules.

Literature Review

A growing body of literature on workstations includes discussions of the scholar's workstation, automation in libraries (both technical and public service areas), and the effect of automation on staff and budgets. A number of articles consider the potential of the NeXT computer as a library...
workstation. There are, however, few articles on workstations for professional catalogers.

Studies by Hine (1992) and Rogers (1989) showed that 53 percent of non-Association of Research Libraries (ARL) members and 26 percent of ARL member libraries surveyed have, or will soon have, automated workstations for each professional cataloger. This represents a sizable investment in library resources.

Thomas and Weston (1990) are developing a prototype system, also using HyperCard software, designed to run on a Macintosh IIx computer to aid in the training of catalogers. Their project is focused on the descriptive cataloging of computer files.

Wizine-Goetz (1990) is leading a project to develop a prototype system, also using HyperCard and the Macintosh II, providing access to portions of the Dewey Decimal Classification and the Library of Congress Subject Headings. By necessity, developing prototype systems requires limiting the scope either by format or subject area. Our project, which is focused on integrating machine-readable reference tools to provide assistance for cataloging in an online environment, complements the projects described above.

NEED FOR AUTOMATED CATALOGING REFERENCE TOOLS

With the move toward client-server technology by the vendors of systems for local online catalogs, it appears prudent—or even necessary—for libraries to provide catalogers with powerful microcomputers instead of dumb terminals. Microcomputers can then be equipped with high-density storage devices like CD-ROM or magneto-optical disks allowing catalogers to build their own resource collection.

Our study was motivated by the following assumptions:
1. Cataloging and classification of materials are labor-intensive activities that require significant investment of time and money.
2. Improved access to cataloging tools, including not only traditional sources but ancillary information sources such as dictionaries, general reference books, and subject-specific materials in areas such as the sciences, would greatly increase cataloging efficiency, provided catalogers did not search more than was necessary.
3. Catalog data are major components of the information access process, and efforts must be strongly focused on streamlining and updating procedures by which data are entered and updated. Even though more processing will be handled by machines, bibliographic control using MARC formats continues to be labor intensive.

IMPLEMENTATION

The acquisition and installation of the NeXT computer hardware was accomplished with ease. The hardware itself is compact and required no special preparation other than obtaining a table on which to place it, and standard electrical outlets. The NeXT computer consists of a 68040 25MHz processor, 8MB RAM, a magneto-optical disk drive that accepts 256MB optical disks, a 17-inch monochrome monitor with MegaPixel Display, a keyboard, a mouse, and the complete system software 1.0. The cost of the NeXT computer purchased for this project was $6,500.

In order to become acquainted with the basic use of the keyboard and mouse as well as selected software packages, the researchers attended campus seminars offered on the use of the NeXT. Within minutes the researchers were able to perform tasks on the NeXT computer. Catalogers involved in the project were given one-on-one instruction of less than 30 minutes' duration.

SOFTWARE

Upon turning on the NeXT and logging on, Workspace Manager, the software for managing files, starts up immediately. The directory browser appears at the center of the screen, a menu in the upper left corner, and a column of icons along the right edge of the screen. A point-and-click interface moves the user through the directory hierarchy, and double-clicking launches applications.
Digital Librarian was easily learned. One needs only to select a target directory, such as the text of AACR2R; enter a keyword in the query box; and hit return or click on search. Digital Librarian locates all references to the keyword and displays them in the summary area. Clicking on a line allows viewing of the document at the point the keyword occurs. Digital Librarian searches in any number of selected target directories simultaneously.

Adding a target directory such as the text of AACR2R, allows indexing according to the standard scheme. The standard indexing scheme creates indexes containing all words of two or more letters other than very common English words, such as the, and like. Punctuation is removed except for hyphens, apostrophes, and underscores. In addition, the index can be turned on or off with a click of the mouse. With the index off, all words in the target directory can be searched.

AACR2R
The American Library Association provided portions of AACR2R on two 5.25-inch floppy disks that were loaded on the magneto-optical disk, and gave permission for its use during this project.

The structure of the data in AACR2R is complicated. A computer science graduate student attempted to remove publishing code embedded in the text. Stripping out the printer's codes proved to be more complicated than time would allow, so the text was used as sent. The result was an on-screen display not as readable as desired but certainly usable.

The screen and print displays for the AACR2R index term collective titles are compared in figure 1. Without the indentation for the hierarchy of terms used in the print index, the index displayed on-screen loses its alphabetical structure.

METHoDoLoGY
For three months, six catalogers in the Original Cataloging Department responsible for cataloging monographs, serials, and microforms were asked to note questions related to descriptive cataloging that they encountered while performing their regular cataloging duties. They were also asked to report sources consulted, with page numbers and rule numbers where the answers to their questions were found. Researchers used the written questions reported by the six catalogers to evaluate the usefulness of the full-text indexing and retrieval software, Digital Librarian.

The types of materials being cataloged included monographs, serials, folded sheets, loose-leaves, and art catalogs. The twenty-one questions used as a basis of evaluation are presented in table 1. Many questions related to the physical description of a piece. A few concerned choice of entry or form of names.

For each question, several keywords were selected, and searches were conducted varying the word order to determine whether word order made a difference in retrieval results. Boolean operators OR to broaden, and AND and NOT to narrow, searches were used. Searches were conducted with the index turned on and off. Browsing was utilized to locate appropriate rules when an exact hit was not obtained.

LIMITATIONS OF THE STUDY
Cost and copyright issues prohibited the addition of cataloging resources other than AACR2R. The sample twenty-one questions were selected because the answers were known to be included in the text of AACR2R. The results, therefore, were not an accurate measure of recall, precision, or time.

Furthermore, researchers employed several search strategies until the correct answer was located. These included scrolling through text until answers were found. The answers might not have been apparent to novice catalogers—especially if search terms were well within the text of the rules, rather than within the first few words.

Precision could not be easily measured with Digital Librarian. After each search query is entered, the system displays the number of hits. However, this is actually the number of files the search term appears in, not the number of occurrences of the search term. Upon selecting a file, one
can scroll through the highlighted terms and count the number of occurrences. However, if the file is too large, the system responds with the message *word not found* rather than an appropriate system message to let the user know the file was too large and that there are additional occurrences of the search term.
Librarian. Similar problems would be encountered with the use of other indexing and searching software.

1. The one-line identification of each file displayed in the summary area is made up of the file path name and as much of the beginning of the file as will fit on one line. The file path names are printer codes, and the brief display begins with the highlighted word, not at the beginning of a rule or sentence. This problem might be remedied by renaming files with more descriptive terms.

2. It is difficult to read text on disk because of spacing problems. There is no differentiation with use of various fonts, boldface, indentations, etc. Appendixes, such as the table of abbreviations, that appear in tabular form in the printed text are rendered almost unusable on disk. The spacing and superscript cannot be duplicated, so information—which appears in columns in the print version—is displayed with no space or incorrect spacing on screen. For example:

   In print:
   Limited Ltd.4
   On screen:
   Limited Ltd.4
   The solution requires programming to remove embedded print codes and to restore display features.

3. Portions of the text, including the introductory material, resulted in inappropriate hits. The table of contents and back-of-the-book indexes, which facilitate access to the printed monograph, hamper online retrieval. These terms resulted in a high number of hits but did not result in the display of the appropriate rule, though they did provide the applicable rule number, which could then be searched with the index turned off. The extra steps required should be eliminated. A solution is to delete these portions of the text.

4. The files, as received, were the text as they appear in print. For the most part, each file contained one chapter. The larger chapters and the index were broken into several files because of size constraints. Again, possible solutions to retrieval problems might be to delete portions of the text or to rearrange text files. Subheadings, place tags, or markers could be added to the text for quick reference to frequently consulted rules, such as in question 11.

5. The entire text of AACR2R made up one target area (one icon on the NeXT display). Searching could be made more efficient by breaking the text into smaller target areas—placing introductory materials, rules, table of contents, back-of-the-book indexes, and appendixes in separate documents so the user can select portions of text to include in the search. Users might find answers to specific questions faster by regrouping related rules together in target areas. The present structure of chapters by format is tied together manually by the use of rule numbers, which are lost in the on-disk text.

RESULTS

The different keyword(s) used based on the 21 questions, and the number of files containing that keyword, are shown in table 1. In some cases only one keyword was necessary, such as in question 7, dissertation. In other cases several keywords were used to be sure all possible appropriate entries were found.

PROBLEMS NOTED IN RETRIEVAL USING DIGITAL LIBRARIAN

1. The number of hits refers to the number of files (displayed in the summary area) in which the word occurs, not the number of times the word itself occurs. Once a file is selected, the display begins with the highlighted word from the search query. The user might have to scroll through several screens of text.

2. After selecting a file from the summary area, any occurrence of the first word in the search query is highlighted. For example, in question 3, if one enters the term publisher
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<tr>
<td>ISSN and monographs</td>
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</tr>
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<td>2. Description of folded sheet</td>
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<td>(with index off)</td>
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<tr>
<td>Physical description</td>
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</tr>
<tr>
<td>3. Treatment of publisher's label on monograph</td>
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<td>Label</td>
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<td>4. Physical description of unpaged volume</td>
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<td>5. Physical description of book wider than it is high</td>
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<td>6. Order of general notes (5XX)</td>
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<tr>
<td>(with index off)</td>
<td>1</td>
</tr>
<tr>
<td>7. Abbreviation for &quot;doctor of philosophy&quot;</td>
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<td>Dissertation</td>
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<td>8. Description of one plate</td>
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<td>Geographic name</td>
<td>11</td>
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<td>Qualifier</td>
<td>2</td>
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<tr>
<td>16. Treatment of artworks</td>
<td></td>
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<tr>
<td>Art work</td>
<td>23</td>
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<td>Art catalog</td>
<td>3</td>
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<td>Program</td>
<td>8</td>
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<td>Exhibition publication</td>
<td>11</td>
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<td>17. Treatment of marks of omission</td>
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<tr>
<td>Ellipses</td>
<td>0</td>
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<td>Marks of omission</td>
<td>3</td>
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<tr>
<td>Omission</td>
<td>20</td>
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<tr>
<td>18. Is “Inc.” required after publisher’s name?</td>
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<td>Publisher</td>
<td>26</td>
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<tr>
<td>19. Use of printer’s name</td>
<td></td>
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<td>Printer</td>
<td>7</td>
</tr>
<tr>
<td>20. Multiple places for publisher</td>
<td></td>
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<tr>
<td>Place of publication</td>
<td>0</td>
</tr>
<tr>
<td>(with index off)</td>
<td>12</td>
</tr>
<tr>
<td>21. Use and abbreviation of “Limited” in the imprint statement (260)</td>
<td></td>
</tr>
<tr>
<td>Abbreviations</td>
<td>23</td>
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first, the resulting display includes 26 hits. After selecting a file, one must then key through several occurrences of publisher before locating the applicable rule. Entering the term label first reduces the number of hits to 12. The resulting display is not only more manageable but allows the user to find the appropriate rule more quickly. To use this narrowing technique the user must be able to anticipate which keyword will yield fewer hits.

3. Although the software is advertised as having Boolean capabilities, it did not perform as expected. When searches were conducted using the same search terms but different Boolean operators (AND, OR), the search often resulted in the same number of hits. The search query International Standard Serial Number resulted in the same response as international and standard and serial and number. Any occurrence of the first word in the query was highlighted.

4. The inclusion of additional terms could not be used effectively to narrow the search. International and standard and serial and number picked up any occurrence of international, including International Relations Round Table. The search query on multiple-language monographs, question 13, picked up multiple designation system serials, multiple places of publications, and multiple pseudonyms. Question 15, terms geographic and geographic name both resulted in the same display, even though all occurrences of geographic were not adjacent to name. The ability to use Boolean adjacency or phrase searching would vastly improve the precision of Digital Librarian.

5. Words with a hyphen are indexed as one word, not two. This can be confusing to users because a search incorrectly keyed can be misleading. In question 14, loose-leaf resulted in no hits. Entering the term looseleaf retrieved three files—the index entry, chapter 2, and the forward information that provides the ISBN number for AACR2R in loose-leaf format—all highlighting the term loose-leaf. Searching the term loose leaf resulted in 2 hits—the glossary entry Portfolio. A container for holding loose materials... and chapter 2—highlighting any occurrence of the word loose.

6. Digital Librarian will also display portions of the search term instead of an exact match. The query folded sheet, question 2, picked up any occurrence of the word fold. In question 16, the search query art catalog picked up artistic, Hart (a rule example), articles, charters, party, and Ann Hobart (a listed contributor in the preface material). This is effectively left and right truncation, which makes the searches much broader than desirable and cannot be turned off.

7. The searcher does have the option of turning off the index and searching by keyword for an exact match. This option can be more efficient because it will then include the chapter headings and rule numbers not included in the indexing. With the index off, terms such as order of information (a chapter heading), 21.1B2 or choice of entry, and place of publication could be found (questions 6, 11, and 10). With the index on, these searches resulted in no hits.

8. With the index off, the search query choice of access points resulted in 2 hits. A display of the resulting documents leads you to the introductory material and to the table of contents. Neither directs you to chapter 21. Likewise, a search for a specific rule number with the index on will result in no hits. A search for the rule 21.1B2, with the index turned off resulted in 8 hits; however, only 1 retrieved the text of the rule, the others led to the term in the table of contents or index.

CONCLUSIONS
The printed text of a monograph, especially one as complex as AACR2R, cannot be made searchable electronically without considerable effort. The structure that facilitates access in the print version—the
table of contents, back-of-the-book indexes, and rule numbers—impedes access in the electronic version, resulting in a high number of hits that do not provide the needed information sought by catalogers.

A number of quick fixes could be made to the text of AACR2R to make it more accessible using Digital Librarian:

1. Remove portions of the text—introductory material, headings, table of contents, and back-of-the-book indexes.
2. Break the text into smaller target areas—perhaps divide rules for description from choice of access rules, or re-group rules by topic (e.g., title and publisher) rather than files by chapter.
3. Add subheadings or tags to reference frequently used rules (e.g., 21.1B2).
4. Remove (or translate) embedded printing codes to achieve more readable on-screen display.

While Digital Librarian can index large amounts of text and provide rapid response to search queries, it is not sophisticated enough to deal with the complexities of AACR2R. In order to retrieve with precision, phrase searching or Boolean adjacency is essential when dealing with a text filled with redundant terms such as parallel title, title proper, other title information, and collective title.

As the researchers worked with the NeXT computer and became more proficient in searching, the amount of time spent retrieving answers decreased. However, it still took five to thirty minutes for on-disk retrieval by the researchers, compared to the two to five minutes reported by the original catalogers using the print source. The researchers did not find using Digital Librarian to access AACR2R more efficient than using the print version. In fact, had they not been familiar with the print text, and been willing to browse through several screens, many answers would not have been retrieved on disk. Further research should be conducted to examine and to compare other full-text indexing and retrieval software packages for accessing AACR2R.

Additional tools should be added to the database, including but not limited to the following: Library of Congress Rule Interpretations; Cataloging Service Bulletin; and the Library of Congress classification schedules.

Hypertext applications linking the text of rules and rule interpretations to the cataloging workform will provide content-specific help for a cataloger preparing the bibliographic record.

Libraries considering developing catalogers' workstations might wish to network workstations and to provide general access to resource tools such as the Library of Congress Name Authority File on CD-ROMs or file servers. The Sterling C. Evans Library has begun to provide cataloging resources on CD-ROM and is considering purchasing powerful UNIX workstations that can easily be networked for original catalogers. All the appropriate cataloging tools will be readily available to everyone on the network.

The advantage of this approach is our library is not faced with the challenge of converting tools to machine-readable form and of indexing these sources. This project shows that indexing is of paramount importance to the usefulness of the tool. The researchers look forward to the availability of AACR2R in machine-readable form, well indexed, for general purposes.

**Works Cited**


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Book Reviews

Lawrence W. S. Auld, Editor


Librarians hold a curious mix of beliefs, including expecting that automation can solve everything, hoping that it will, suspecting that it cannot, and almost wishing that what we do is ultimately un-automatable. Still, as librarians cope with resources that do not keep pace with either current demands or their own dreams for future service, artificial intelligence and expert systems are increasingly looked to for possible solutions.

In 1990, the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign focused its annual Clinic on Library Application of Data Processing on artificial intelligence (AI) and expert systems. This work contains the twelve papers delivered at that clinic. Several authors address basic topics, including Metzler's exploration of intelligence and logical reasoning, Borgman and Plute's discussion of user models, Parrott's connection of AI to the foundations of reference theory, and Warner's overview of natural language processing. Some authors address particular applications, including Fenly on determining what technical services activities might best benefit from AI techniques, Waters' summary of AI applications at the National Agricultural Library, and Pontigo et al.'s description of using expert systems for document delivery in Mexico. The focus throughout is on applications as indicators of potential rather than on applications per se.

The breadth of coverage, from theory to applications and from technical services to document delivery, sets this work apart. There is little overlap among the papers. All assume familiarity with issues and terminology. There is little gee-whiz. This is not a beginner's manual, nor is it for the reader who wants to learn a little about expert systems in a hurry. It is better suited to readers beyond the introductory stage who wish to deepen their understanding of major issues relating to the development and application of artificial intelligence and expert systems to libraries. Some papers make for heavy going, especially Metzler's, which, by being first in the volume, could by itself discourage the casual reader from continuing, but the content rewards those who persevere. — Janet Swan Hill, University of Colorado at Boulder.


CD-ROMs (compact disc read-only memory) have held a singular place in the technological developments that have begun to influence the provision of reference services. Proportionately less expensive than integrated library systems in terms of equipment, software, and training, CD-ROM products offer the prospect of less complex and more immediate impact on the level and quality of assistance that can be provided to library patrons.
Once the surface allure is scratched, the complexity of establishing a working environment filled with CD-ROMs is quickly revealed. Stand-alone CD-ROM workstation configurations can be set up with relatively little pain and suffering. The highly attractive arrangement of CD-ROMs in a local area network is filled with complexities that can completely demoralize reference or systems librarians if they have not done their homework.

The intent of this book is to provide a very basic introduction to some of the complexities associated with local area networking and CD-ROMs. Each of these topics is sufficiently technical and undergoing such rapid change that extensive cutting-edge information and knowledge may be impossible to gain from any book. A basic introduction is possible, and this book does a fairly successful job of achieving that goal.

The book consists of three principal segments: local area networks, CD-ROMs, and future prospects and present and future issues. The first two segments cover both hardware and software. The latter segment addresses technological developments that are on the horizon such as licensing, leases, copyright, and pricing. Each of the seven chapters that make up the book is the product of a separate author, which brings a certain unevenness to the coverage of all facets of networked CD-ROMs.

The first three chapters discuss what a local area network (LAN) is, CD-ROM software that supports the LAN environment, and the hardware that is needed. Some of the material in the chapters has already become outdated with the widespread adoption of 386 and 486 personal computers in the IBM-compatible world. The fact remains, however, that a LAN is still a LAN, and the basic components have changed very little. The principal methods for accessing CD-ROMs over a network are presented. One of the most useful sections in this part of the book describes an approach for determining the best CD-ROM network solution. A number of CD-ROM network products are described briefly, but many of these have experienced upgrades or new releases, so the material is not completely current. There is a brief chapter devoted to hardware options. This is another instance where the specifics are already outdated but some of the generalized information can still be useful.

One chapter is devoted to factors that a LAN systems administrator must take into consideration as a library moves to network CD-ROMs. Some of the topics covered are issues that are fundamental to any type of local area networking, while others would only arise as CD-ROMs are networked. The most useful segment of this chapter might be the section that addresses product selection and costs. It would seem that this is more of a collection development issue than one related to networking.

In the last two chapters of the book, authors attempt to identify future concerns for local area networking of CD-ROMs from the hardware and nontechnical sides. Briefly reviewed are a number of promising new technologies that hold the prospect of improving the use of CD-ROMs as well as displacing them. The issues of connectivity, RAM (random access memory) cards, and jukeboxes are discussed briefly. A very limited explanation of multimedia computing is offered to the reader. Similarly short explanations are provided on a variety of network standards. Adequate descriptions of these standards could have doubled the length of the book and lost all but the most technically inclined readers. Limited space is given to discussing the issues of data compression that will influence many of the directions that CD-ROMs take.

Licenses, leases, copyright, and pricing are subjects covered in the final chapter. Although these are nontechnical issues, they will have an immense impact on the future development of CD-ROMs and related products as a marketplace. An underlying theme is that the marketplace is still unsettled as vendors and manufacturers seek ways to recoup and protect their investments without restricting the potential growth in demand for these products. The reality that individual librarians will have to face is that most of these issues will remain unresolved for a number of years.

Networking CD-ROMs and the as-
sociated marketplace is changing so rapidly that anyone charged with the responsibility for installing and operating a CD-ROM network would find this book inadequate in terms of assistance. The book has the potential to be extremely helpful to a majority of librarians who would benefit from a fundamental understanding of local area networking, the technical basis for CD-ROMs, and the related philosophical issues that have arisen. However, do not presume that reading this book or any other will make you an expert in the local area networking of CD-ROMs. Extensive reading will help, but only actually setting up the networks will provide you with the firsthand experience necessary to becoming an expert.—Ken Marks, East Carolina University, Greenville, North Carolina.


In 1978, the quarterly journal Collection Building was founded to serve as a forum for discussion and debate on all aspects of collection development. In the fifteen years since then, the field of collection development has faced its greatest challenges as libraries have undergone changes in concept and culture. The Collection Building Reader, co-edited by library consultant Betty-Carol Sellen and Arthur Curley, director of the Boston Public Library, brings together thirty of the best articles published in the journal during this period. They are organized around the following themes: management issues, selection/deselection, evaluation, and resource sharing.

Collection development librarians will quickly recognize the names and the themes on the pages of this book. The editors have chosen well, documenting the liveliest issues in the field in the past decade, ranging from information policies for librarians (Joe Branan) and writing collection policies (Bonita Bryant) to the organization of collection management in academic libraries (Carolyn Bucknall), preparing the beginning bibliographer (Charles D’Antiello), the faculty perspective on collection building in the college library (Mary Sellen), and foreign-language collection development in public libraries (Marie Zielinska and Irena Bell). The section on evaluation covers all approaches, the subjective and qualitative as well as the heavily statistical, list-checking, and serials. Included are contributions from, among others, Bill Katz (on “the fallacy of formula”), Elizabeth Futas, and Cynthia Comer. In the final section, the reader encounters the classic thoughts of Paul Mosher and David Stam, as well as other very useful contributions on, for example, regional cooperation (Medea Ionesco) and collection management in an automated environment (Anne Marie Allison).

What unites the diverse contributions to this volume is the focus on collections as the foundation of the library, regardless of size or type. In the book’s introduction, Curley, the journal’s editor since 1978, stresses that collection development is an essential responsibility, even in the face of “trendier obsessions.” Among the goals of the journal (and, therefore, of this book) is the desire to highlight the diversity within collection development in terms of both tasks and formats. Another is to stimulate the practicing librarian, which The Collection Building Reader will certainly do.

This work will interest the seasoned collection development professional as well as the beginning student of library and information science. The articles are succinct and oriented to the practical rather than the theoretical. Each article is accompanied by a bibliography, which further enhances the usefulness of the volume and documents the development of the issues addressed. Because this is a retrospective volume, it would have been helpful to have the date of the original appearance in print of each article, thus providing the historical context for the ideas expressed, but this is only a minor oversight in what is a very welcome contribution to the literature on collection development and management research.—Deborah Jakubs, Duke University, Durham, North Carolina.

An earlier work, *Collection Development: A Treatise*, edited by Stueart and Miller (1950), became a landmark soon after its publication. In a sense, Stueart and Miller's work signalled the maturation of a specialization in librarianship that was born in the phenomenal growth of library collections following World War II and Sputnik. Now, just more than a decade later, Charles Osburn and Ross Atkinson have edited *Collection Management: A New Treatise*. Like its forerunner, this new publication is a two-volume work in the JAI Press series "Foundations in Library and Information Science." As was true of the earlier work, this volume contains more than twenty essays by some of the most prominent authorities on collection development and management.

While quite similar, the title change should not go unobserved. *Collection management* has become the accepted, encompassing term for the activities of selection, acquisition, evaluation, preservation, and weeding. Some of the contributors make more of terminology than others, and several observe that some ambiguity will continue to exist. It is interesting to note that *collection development* was retained in another recent title, *Collection Development in College Libraries*, edited by Hill et al. (1991).

Osburn and Paul Mosher both had essays in the earlier Stueart and Miller work. Many of the new contributors are equally well known. It does appear that a greater percentage of the contributors in this new work are practitioners and administrators as compared to educators in the older work, although both have good representation. Nevertheless, this new treatise contains more essays that focus on the practical and operational as opposed to the philosophical and theoretical. The editors admit that "there is little uniformity to be found . . . in terms of style, organization, and documentation" (p.xvi). Their desire was that the contributors should be creative in providing a current assessment that was both retrospective and prospective about the field.

Two "overview" pieces begin the collection. "The History of Collection Development" by Robert Brodus is a straightforward retelling of that which is commonly known by collection developers. Then, in "The Conditions of Collection Development," Ross Atkinson provides a contextual statement and theoretical model. As in his other writings, Atkinson is erudite and thought-provoking. He considers temporality and the simultaneity of circumstances to be key in understanding collection development. He says it is a serious mistake to attribute to any discipline a single core of materials without respect to local needs and values.

Following the overview essays are six essays categorized as "administration." Then come five essays on the nature of the information universe available to collection developers. The section on selection contains six essays, and the last group of essays is devoted to types of libraries.

David Farrell and other contributors note again that written collection development policies are essential but far from universal. One wonders whether they really are essential in an economic environment where demand is the dominant decision factor. Joe Branim concludes that cooperative collection development is still not fully established and that only modest successes can be reported during this last half of the twentieth century. Unlike several other contributors, David Henige is not too sold on the Research Libraries Group's (RLG) conspectus approach. Michael Ryan says that special collections are more in the mainstream now than was once the case. On the other hand, David Roskuska admits that government documents have been removed from the mainstream, and at the same time, he points to promising developments for bringing them back.

Considering the categorization of the essays, it should come as no surprise that considerable overlap exists in the discussion of issues. The editors anticipated this—it is in the nature of the topic. Among the topics discussed by several of the contributors, two stand out. The significant impact of the RLG conspectus on the collection development scene is mentioned
frequently. Likewise, again and again, the writers stress the interdisciplinary nature of information and the fact that it is growing more so.

This work will not supplant the Stueart and Miller work, nor was it intended to do so. It is not for the novice, although many fundamentals are covered. Like any collection, the essays vary in quality. The essays are generally well written, with only three or four typos noticed. It does fulfill its goal of providing a new assessment in good fashion.—Don Lanier, University of Illinois at Chicago, College of Medicine at Rockford.

WORKS CITED


This comparison of the 20th and 19th editions of the Dewey Decimal Classification (DDC) highlights the improvements and remaining shortcomings of Edition 20 in regard to its predecessor. In this revision of Jeanne Osborn's (1982) Dewey Decimal Classification, 19th Edition: A Study Manual, editor Comaromi's organization is good and easy to follow. He first focuses on the history of the Dewey Decimal Classification and its general character, then discusses its modernization through changes over the years in indexing and terminology and in the tables.

Edition 20's treatment of the system from the 000s to the 900s are analyzed in chapters 6-15. In each of these chapters Comaromi helpfully provides both analysis and synthesis sections. Library of Congress-assigned Dewey class numbers for titles are found in the analysis sections, while descriptions of books for which he later supplies the author, title, and Library of Congress-assigned Dewey class numbers are found in the synthesis sections.

He closes the book with a comparison of the 12th and 11th abridged editions and includes further comparisons with earlier editions and abridgements. In concluding, he intimates that the Dewey Decimal Classification will survive because revision keeps it up to date; its arrangement is acceptable; its notation system is practical, memorable, expandable, and adaptable; and it is familiar to the user.

Comaromi rightfully recognizes that Edition 20 is more evolutionary than revolutionary, incorporating the best innovations of the earlier editions. No see references appear in DDC 20, and the mindless indexing of Edition 19 disappears. However, Edition 20 retains 85 percent of Edition 19's indexing terms, making them multiword terms following the policy set in the Anglo-American Cataloguing Rules, 2d ed. Dewey's white, Anglo-Saxon, Protestant bias remains in table 2, which dominates the history schedule, stressing political units in Europe and the United States over physical and other regional areas.

Comaromi finds the Education (370) section's structure poor, and indeed this area is under consideration for revision by the Decimal Classification Editorial Policy Committee for Edition 21. Although extensive revision was done in the 400s, Comaromi still does not believe that this class reflects how language is studied or viewed. To Comaromi, the 620s, Engineering and Allied Operations, do not make sense where humans as the creators of ideas and humans as the makers of physical things are not well distinguished. He also believes that the 790s, Recreational and Performing Arts, are total chaos, but he does not explain why.

Although highly technical in nature, the book is easy to read, but Comaromi does not always effectively communicate the illogic that he finds in some of the classification schedules. It is hoped that the book's indications of improvements in the Dewey Decimal Classification will facilitate catalogers' application of it. Also, students of cataloging should find the book in library school libraries as they begin to learn the
intricacies of DDC and how it has evolved over the years. The information contained here will be valid at least until the Decimal Classification Editorial Policy Committee issues the 21st edition in 1996 with a full development of the 1991 Persian Gulf War among other enhancements.—Bob Ivey, Memphis State University, Tennessee.

WORK CITED


This volume reminds me of an earlier period of intense concern when the online catalog was still in its infancy and was not yet the commonplace tool for library access that it is today. As during that time, the authors of the selections in Enhancing Access to Information: Designing Catalogs for the 21st Century seek to glimpse the future based on present trends without certain knowledge of how it will all turn out.

David A. Tyckoson, the editor, has chosen an apt image in his excellent opening piece. The famous train between New York and Chicago, the Twentieth Century Limited, exploited the best railroad technology but still became irrelevant as the public chose other means of transportation. He fears that the same is true for the traditional catalog, an eighteenth-century ideal, that no longer contains the information that users find most useful. He gives a succinct history of library catalog evolution and summarizes possible enhancements.

The next four sections give the authors’ vision for a rejuvenated twenty-first-century catalog. “Enhancements to the Traditional Catalog” includes increased use of contents notes (Dwyer); inclusion of previously uncataloged materials (Syracuse and Poyer); more Library of Congress subject headings (Studwell); and better integration of holdings, location, and circulation status into the bibliographic record (Stephens). In the book’s most theoretical article, Mary Micco looks at new possibilities for subject access with hypermedia including coordinating subject headings and classification. The next section provides two perspectives on linking catalogs through the Internet and other telecommunications systems. Sloan looks at users dialing in, while Engel discusses patrons dialing out from their local institutions. The fourth section, “Building the Catalog through Non-Traditional Databases,” looks at linking citations in periodical databases with library records (Barnes and McCue), entering the nonstandard cataloging of an audiovisual collection into a library catalog (Harwood), and using the OCLC Online Computer Library Center’s Online Union Catalog to batch-load microform set records (Carter, Olson, and Aquila). The book’s final section then provides a more coherent, historical look at the development of enhanced systems at the Georgia Institute of Technology (Dyke-man and Zimmerman) and Rensselaer Polytechnic Institute (Molholt and Forsythe).

I enjoyed this book and took away several ideas to use in my library. Its down-to-earth, nontechnical orientation should appeal to practitioners including administrators and public service librarians, though at times, I wished for more theory. For example, a discussion of the effect of file size on retrieval for those enhancements that multiply access points would have been a useful addition. I also wanted more information on users’ reactions to these changes. Nonetheless, the diversity of the experiments to provide better patron access is an encouraging sign of librarians’ efforts to move forward with the new technology. By its nature, this book will be obsolete within a few years. Nevertheless, I recommend purchase for those who wish an overview of current creative efforts to exploit technological possibilities.—Robert P. Holley, Wayne State University, Detroit.

Peters, a humanities and bibliographic instruction librarian at the University of Missouri-Kansas City, has produced an exceptionally wide-ranging appraisal of the problems of online catalogs in academic libraries. His "motivating observations" are that (1) most catalog use studies merely reflect users' attitudes and opinions and (2) remote access will transform online catalogs and academic libraries permanently.

These concepts converge near the end of the book with an account of his study of remote-access use of the University of Missouri catalog, LUMIN, but not before Peters has exhaustively traversed much of the ground in current online catalog research. Beginning with heavily referenced essays on librarianship and technology, the history of the online catalog, and how each fits into Heidegger's "question concerning technology," he eventually moves on to the substance of his book, a lengthy discussion of people's problems while using online catalogs and the possible resolutions of those problems. Peters sees defects in both the catalog systems and in their users' searching methods. He concludes that, although there are improvements to be made within the systems, academic library users should be capable of using these sophisticated scholarly tools and must be taught to do so. He believes that an "idiot-proof" system creates idiots and that intelligent use of a complex catalog will "socialize" students into the academic community and contribute to their intellectual growth. Ideally, most bibliographic-catalog use instruction can be incorporated into the catalog itself.

Peters' account of his research on remote use of the Missouri system follows. He studied search types and strategies, use of the scoping and truncation options, failure rates, and "temporal" aspects of dial access sessions. His findings were that remote users are skillful searchers, that they search for specific titles, thus using few subject searches, and that zero-hit sessions usually occur because the libraries don't own the material. Temporally, searches took place most often during normal working hours. This study was conducted solely from transaction logs, thus avoiding user bias.

Peters' assertions throughout the book are thought-provoking, but this reviewer sometimes wished for more substantiation than he typically offers. For example, in his opening chapters he contends that the online catalog has contributed to a "backslide" from adequate bibliographic control and that catalog users might be using the catalog as an end in itself, rather than for access to full-text documents. Similarly, his final chapter states that in-house library use is declining while remote use is increasing dramatically, resulting in a diminishing need for subject access, and that libraries should encourage people to "use the library without coming into the building" (a distant prospect for all but the most technologically advanced).

Peters' book is supplemented by an eight-page bibliography and an index. (The bibliography is not annotated and classified, as the publisher's flier claims.) His style varies from ponderous to lively. It is unlikely that The Online Catalog will find a wide audience in the arena of practical librarianship. Its merit should be considered, however, by students of library science as well as those involved in designing systems and carrying out bibliographic instruction.—Karen Rice, Western Washington University, Bellingham.


With Michael Buckland presented as author of a book, coupled with Michael Gorman writing the foreword, that book immediately promises to challenge our present conceptions, to educate, to irritate, and to include many ideas that will be common practice in the future.

As promised in Gorman's foreword, the book is both visionary and practical. Whether one agrees with Buckland or not, a key factor emphasized throughout the book is one we should all give more priority to in our libraries: that libraries provide a constituency-based service. We should
consider our constituents rather than dwell so much on what we think they should want or need. And this slim volume is being published at a time when we all are—or should be—trying to project our strategic planning to what we think the future holds, a projection that at most can be an educated guess.

Buckland reviews the "history" of the paper library before moving on to the topic of redesigning library services. This review is helpful in comparing our two types of libraries with which we are familiar. As the author reminds us in different parts of the text, and particularly in his chapters on bibliographic access and collections, libraries are here to help the user identify the information wanted and needed, to determine where that information can be found, and to provide access either with the information in the collection or through obtaining the information by some other means. Buckland does not propose abandoning the paper library but, rather, raises a number of issues. Similarly, he does not adamantly state what the solution will be but encourages the reader to focus on the process of identifying the solution that will be best for a particular situation.

We live in a world of technology and are a people to whom convenience is a high priority. Libraries must consider both technology and the users' desire for convenience when examining how we provide services to our constituents. As Buckland points out, we are also a self-service society, but we have structured many of our library services toward a one-on-one provision of services. His chapter on serving the user emphasizes the need to approach provision of services from a different focus.

In Redesigning Library Services, Michael Buckland does not present tidy solutions or descriptions of how library services will be redesigned. Rather, he highlights the changes that have occurred and focuses on the evolutionary nature of our library organizations.

It is the recognition of this evolutionary nature that is important to take from reading this book. Indeed, Buckland sketches the challenges that we will be facing.

Redesigning Library Services is a quick and easy read and will reinforce the beliefs of a number of library administrators. It might be helpful in redirecting some of the traditional attitudes or approaches of many. It is recommended for reading by practitioners in libraries. Librarians in libraries being renovated or undergoing other major changes will benefit.—Jennifer Cargill, Louisiana State University and A&M College, Baton Rouge.


This is one of the most practical and utilitarian guides I have seen, and the editor has made every effort to present materials that are up to date. Written for both managers of microfilm projects and for the workers, it defines concepts, terms, and procedures, walking managers and staff through sets of guidelines. Tables, charts, and illustrations abound, highlighting the explanations in a graphic manner. For example, a person does not have to read the definitions of cine mode or comic mode after glancing at the accompanying illustration. A chapter of terms from the fields of micrographics, librarianship, preservation, and administration that are used in Research Libraries Group (RLG) microfilming projects brings thoughts into relational focus. Many of the definitions include see also references, directing the reader to related definitions. A section of guidelines details prefilming procedures, creating targets, technical guidelines, and labeling and marking microfilm containers. The largest section by far is that of Appendices. The section covers a multitude of areas including considerations relative to the book as a [unique] object, sample contracts, the operational impact of a filming project on various library units, sample targets, pros and cons of fixed versus variable reduction ratios, recommendations for film inspection, and questions and answers about polysulfide treatment of microfilm using IPI Silverlock.
While not all libraries are RLG members, many do microfilming, either in-house or on a contract basis, at one time or another. For novices who do not have any experience or do not know any of the appropriate questions to ask, or for managers and staff who have had past experience and want to be brought up to date, this is an excellent handbook to have at hand. It represents the consensus of more than 40 experts in the field, bringing to consideration the results of their collective experience. While it is an easy book to use, it stimulates thought and delineates the consideration and planning that must go into a project so that the results will be good.

Even the design of the book is practical. It is spiral-bound so the pages will lie flat for easy microfilming of test pages.—Mary Boccaccio, East Carolina University, Greenville, North Carolina.


This volume is a collection of thirteen chapters written by librarians who have varying experience in technical services areas. Topics covered are education (Sheila S. Intner); organization of operations (Arnold Hirshon); managing technical services (Marion T. Reid), catalog departments (Alice J. Allen), copy cataloging (Kent R. Murphy), online catalogs (William Gray Potter), and acquisitions (Kathryn A. Soupiset); acquisitions librarianship (Tamara Frost Trujillo); serials automation (Barbara A. Winters); technology (Meta Nissley); staffing (Frank D'Andraia); and vendor performance (Thomas W. Leonhardt) and selection (Dana D. D'Andraia). There is a subject index, and most chapters have a list of references and/or a bibliography.

The book does not have a stated purpose. It lacks an introduction that indicates the editor's intentions about audience level; content selection, organization, originality; or significance; or publication timing vis-a-vis professional literature urgency. This benefits neither authors nor readers. Closer editorial attention could, for example, have provided context for arrangement and content of the essays; explained repetition and omissions; and eliminated erroneous (p.241) and outdated citations (p.3), jargon ("knowledge workers"), condescension ("your staff"), and credo ("The Serials are Different, Rare Books are Special Myth"). An introduction could have informed readers that the volume is meant to be a basic technical services text focusing on practice in academic libraries; instead, we are forced to infer this from the styles and backgrounds of the authors as we peruse each essay. Indeed, little is here for experienced librarians (except, perhaps, the results of Trujillo's interviews). It is disappointing not to have from this group of writers an examination of the underlying (often classist) assumptions about organization and operations, such as that six is the maximum number of areas that can be considered technical; that technical services divisions are managed rather than administered; or that acquisitions, cataloging, copy cataloging, and even online catalogs are to be managed, but serials is to be automated.

Recommending a book without a stated purpose but with a $63.50 price is difficult. Individuals who seek basics will be better served by the second edition of *Library Technical Services: Operations and Management*, edited by Irene Godden (1991) or by reading the primary literature (such as the writings of Jean Cook, Kaye Gapen, or Karen Horny) rather than its synthesis here. Technical Services in Libraries is possibly of interest to librarians who develop comprehensive collections in library science or in technical services librarianship.—Charlotta C. Hensley, University of Colorado at Boulder.

**Work Cited**


The editor's preface refers to this item as a "guide" or "manual," although in a strict sense it is neither. The volume consists of twenty-one separate contributions based on various combinations of opinion and experience, written by vendors and acquisitions or collection development librarians. It is organized into three major sections: (1) vendors' perspectives on vendor selection and evaluation; (2) librarians' perspectives on these topics, and (3) approval plans.

Many of the ideas in the initial section, to which representatives from the Yankee, Blackwell North America, Midwest, Ingram, and Ballen book dealers contribute, are fairly conventional, i.e., vendors and librarians should work together for their mutual benefit. The ever-increasing role of automation in vendor services is a constant theme, with Forrest Link's discussion of the BCIS (Books for College Libraries, 3d ed.) tape service an especially noteworthy piece. Both Larry Price and Leonard Schrift predict a shakedown in the number of vendors during the 1990s.

The next section covers a variety of topics, including foreign acquisitions, by Linda Vertrees; centralized versus branch collection development, by Don Lanier; and online preorder files, by William Jarvis. Two different chapters advocate consolidation of serials orders with a single vendor. Among the most rigorous contributions is Charles Brownson's mathematical analysis of order data that suggests a "tradeoff" between a vendor's speed and overall fill rate.

The section on approval plans offers a solid overview of their role, operation, history, and literature. In an intriguing comparative study of two different plans with the identical vendor, Sally Somers concluded that Tulane University's restricted profile, engendering low expectations, resulted in greater client satisfaction than the University of Georgia's "wide-open" profile, which gave rise to high expectations.

The book ends with two "special reports." Robert Bravard's memoirs of Choice magazine's early history, including his perceptions concerning the dismissal of its second editor, will interest intellectual freedom specialists. A. A. Alema's discussion of resource sharing in African libraries adds an international touch.

This volume lacks the unifying characteristics of a book—possibly because it was published simultaneously as a journal issue. The two special reports are not directly relevant to vendors, while some of the chapters are only marginally related to their section's dominant theme. Important aspects of vendor-acquisitions librarian relations, such as the ethical and legal dimensions, are hardly mentioned (although one must note that an earlier issue of The Acquisitions Librarian was devoted to ethical-legal questions). There is no index.

The book's greatest strength is that vendors and librarians communicate their diverse perspectives and expectations of each other. Much practical advice is provided, especially concerning how vendor services can be more effectively used by libraries.

Some of the contributions are quite useful. Others merely fall into the "how to do it good in our library" category or are pedestrian in nature. This is not an outstanding book, but it undoubtedly belongs in large library science collections. For many readers, Understanding the Business of Library Acquisitions will offer more value.—Thomas E. Nisonger, Indiana University, Bloomington.

**Work Cited**


The volume is logically arranged, with an introduction that gives a good overview of interface design principles, current in-
terface limitations, and expected forthcoming changes in human-computer interactions.

The twenty-two papers in the volume are organized into six parts that reflect major areas of research and endeavor associated with user interfaces. The chapters presented in part 1, “Interface Styles,” discuss the fundamentals of human-computer interaction and the various models behind system design. Part 2 is focused on the role of artificial intelligence in interface design and function. Hypertext is the subject of part 3 with chapters on the use of hypertext in information retrieval systems and the new-found demands this technology places on the user interface and information display. In part 4, “Case Studies in Human-Computer Interaction,” the authors present information gained through either the design or the evaluation of an information system. These chapters stress the importance of capturing data from both the system and the user. Closely related, but with a narrower focus, is part 5, which discusses the evaluation of systems and interfaces. These chapters describe methods and findings obtained from users of operating systems and through prototyping and simulation. The final part presents a balanced look at standards and current trends among various standards organizations.

The volume is complemented by collecting authors’ background and research interests into a section, “About the Editor and Contributors.” Readers should find this section useful in identifying the authors’ current research interests.

In my opinion, the volume only partly does what the editor set out to do. It distills and synthesizes the forces and trends that bear on user interface design; however, it is not “a well-rounded introduction for those entering this quickly evolving field of human inquiry” (p. xxv). Some chapters are more difficult to read and require more technical knowledge to digest than others. For interface novices, this book will not be light reading and will require commitment to read cover to cover. For interface veterans, this volume couples breadth and depth in its coverage of today’s interface development.

I recommend purchase of this volume for professional collections with interest in human-computer interface design.—Judy Jeng, Newark Campus Libraries, Rutgers University.


The seventh edition of this standard textbook was published in 1985. Some of that earlier edition’s content has been transferred to other parts of this new edition or relegated to the two new appendixes. The text, examples, notes, and readings of various sections of the eighth edition exhibit varying degrees of updating, reduction, expansion, and rearrangement. There is a new chapter on authority control, though some of the material included therein appeared elsewhere in the prior edition. An example of substantial revision is to be found in the chapter on catalog management. Two former components devoted to a bibliography and to cataloging and classification aids are now amalgamated into a single bibliography. The new edition is much improved in display, legibility, contrast, and ease of use.

The opening chapter covers cataloging principles as before but sets them in the context of bibliographic control, whereas the following chapter provides a more balanced sketch of code development. Almost half the book is focused on the 1988 revision of the Anglo-American Cataloguing Rules (AACR2), incorporating new rules, new Library of Congress rule interpretations, and some new examples. There is a need for an introductory text addressed to all future library and information professionals, especially those who will work as readers’ advisers or search intermediaries. Taylor has designed this work specifically for “beginning and intermediate catalogers” (page xv), but it is certainly too long and densely detailed for beginners and perhaps also for intermediate level catalogers. Moreover, AACR2 is itself logically structured and suitable for private study, especially if augmented by samplers,
self-instructional texts, and bibliographic records.

The chapters on Dewey Decimal Classification, the Library of Congress Classification, Library of Congress Subject Headings, and Sears are all solid, painstaking contributions that reflect new editions of these systems. Chapter 16, “Classification of Library Materials,” reveals a misunderstanding of the meaning of some key technical terms. This confusion seems greatest when dealing with faceted classification, and among faulty explanations are those concerning complex subjects, facet indicators, and the sequence of facets in Colon Classification. Although the ongoing second edition of the Bliss Bibliographic Classification is now half completed, it no longer appears in the bibliography. In chapter 20, the text section on the new Bliss scheme is unchanged, and it is unfortunate that a criticism of the old edition is cited without corresponding mention of a response made by chief editor Jack Mills (Libri 26, no.2:156–57 [June 1976]). The section on the Preserved Context Indexing System (PRECIS) is brought up to date, and the new British Library system is introduced. All the chapters on subject classifications, subject headings lists, and procedural systems would be enhanced and enlivened by a more comparative treatment.

The labor and complexity involved are considerable in any attempt to coordinate within a single volume an up-to-date comprehensive introduction to cataloging and classification. It is hardly surprising that there appear to be few alternatives to this carefully written text.—Alan R. Thomas, St. John’s University, Jamaica, New York.


The intent of this book is set forth in the preface, in which the authors state, “The need was obvious for a selective bibliography to focus on design that would not only house collections appropriately but also be comfortable for readers and staff” (p. vii). That goal and more were achieved in this publication. The work is made up of three major sections: a summary history, a guide to the literature, and appendices.

Part 1 provides a historical summary of the design of libraries and preservation of books. Early libraries, American libraries, and contemporary library design form the major segments of this overview. A description of the stacks designed by French architect Labrouste for the Bibliothèque Sainte-Geneviève in Paris in the mid-nineteenth century provides the bridge to a discussion of American library design. A quick overview of a century of library building and equipment design efforts is presented by focusing on the contributions of a small group of U.S. librarians, architects, and manufacturers. The section on contemporary libraries includes a description of the forces that affected design work after World War II. The authors take the position that the increasing emphasis on the delivery of service and the improvement of patron access has resulted in library designs with diminished concern for preservation of materials.

As interesting as the historical summary is, the substance of this book is in the second and third segments. Part 2 is arranged in six chapters that provide a guide to the literature. Although the focus of these chapters is recent material,-reference is made to works that have become classics in the literature. An important point is made several times about the lasting value of some of the studies and analysis done in the first third of this century. Equally useful are the citations to work done in the United Kingdom and Western Europe. This is a valuable resource that Americans too often overlook when they review the literature. Although the authors could have been trapped in extensive presentations of facts, standards, requirements, and codes related to building design, they successfully avoid that temptation. Accepted standards are discussed in a way that permits reference to various citations that can provide an in-depth understanding of the topic. Chapter 5, “Safety, Security, Emergency Planning, and Insurance” might be one of the more
useful to many readers as it covers a diverse set of topics that are becoming increasingly important.

The appendixes provide the "icing" for this book. There is a list of relevant journals, many of them related to architecture and the construction industry. Equally valuable is the list of organizations that are associated with building design and preservation.

The book is written in a style that is easy to read. The organization of the material seemed appropriate to this reviewer. The combination of a textual overview with specific citations facilitates exploring topics of interest. The work is far more useful than a bibliography on the topic would be. Compared with Planning Library Facilities by Mary Sue Stephenson (Scarecrow Pr., 1990) it is a more valuable publication. Any librarian or library administrator would be well served by adding this title to his or her collection.—Ken Marks, East Carolina University, Greenville, North Carolina.


According to Webster's, a handbook is "a ready reference" or "a concise reference book covering a particular subject." As such, DePew's handbook does an admirable job. A professor at the School of Library and Information Studies at Florida State University, he is able to synthesize current thinking about preservation activities clearly in outline format. His work "is designed to introduce those who have little knowledge of the preservation of library materials" (p. xvi), although experienced preservation librarians will appreciate owning a copy. His statements are carefully documented, and his citations represent well the significant research in the field.

In nine chapters and ten appendixes, DePew presents the how-to of preservation activities. Beginning with the historical background of paper and papermaking, he covers topics on the environment, care and handling of library materials, binding, and in-house repair. Also included are chapters on acidic paper and brittle books; photographic, audio, and magnetic media; building and collection surveys; disaster preparedness and recovery; and a final section on preservation services, suppliers, and educational opportunities. A useful but simplified collection condition survey methodology is presented, but as DePew notes, determination of sample size can be tricky, indeed. Some of the topics included in the appendixes are a sample library binding contract, a collection condition survey form, and a useful glossary of terms.

By its nature, a handbook must take a pragmatic approach to its topic, and discussion of theory is generally reserved to a brief introductory statement. DePew has omitted discussion of preservation administration activities due to space limitations, but the topic should be considered this handbook's raison d'être. Preservation administrators have only limited resources for preserving our cultural heritage. Like it or not, tough decisions must be made now concerning selection criteria, and preservation management strategies are needed to deal with this complex problem. Just how do we determine the basis for permanent retention of a multi-artifactual collection? How do the similarities and differences among books, manuscripts, and media influence our thinking about what should be saved? How do cooperative efforts, whether at the local, regional, or national level, influence in-house decisions? Although outside the scope of this handbook, we must also address the issue of the preservation of museum-quality artifacts, e.g., old scientific instruments.

Under consideration in the archival community is a special form of appraisal technique, documentation strategy, which offers the potential for reconciling intellectual and artifactual research value with the costs and implications associated with a retention decision. Despite the commonly accepted limitations of a handbook, I am suggesting that a more comprehensive discussion of appraisal strategy be included in the text. As a case in point, the section on special collections care does not attempt to explain the significance of historical documents to scholarly research activities, nor why individual items in such
collections should be preserved in as close to original condition as possible. The appendix on intrinsic value represents only a portion of the theoretical discussion, as does the section on selection criteria for preservation microfilming. The Commission on Preservation and Access is still attempting to grapple with the question of intrinsic value and its relationship to research.

In any book that draws from a large mass of materials, questions can always be raised regarding selection of sources or statements made. One important work not mentioned in the handbook is *Preservation of Historical Records*, an independent study conducted for the National Archives and Records Administration. Also, the amount of information provided is occasionally too abbreviated. For example, in noting the similarities of composition between shellac records and books, DePew does not mention that shellac records also present different preservation problems, because their compound composition requires a binding agent, such as a natural resin formed from insect secretion. Another omission is that Smyth-sewing produces a book that lies flat when opened. However, these examples should not detract from the fact that DePew's handbook is otherwise a reliable guide. He is fastidious in his choice of sources consulted. For example, a table illustrating permanence of color films, drawn from an article found in a popular photography magazine, was found to be based on the data of Henry Wilhelm, a member of the task group responsible for revision of the American National Standards Institute standard for color-stability test methods.

The book is adequately made for a case binding intended for repeated, long-term use. It is Smyth-sewn, and the paper is acid-free. I recommend its use in college and research libraries. — Dianne Stalker, Columbia University, New York.

**WORK CITED**


This is a collection of eight essays about issues and conditions that technical services managers are likely to face in the 1990s. Contributions range from systematic descriptive treatments of the management environment resulting from the introduction of new technologies, to discussion of paradigm shifts and general perspectives, and even to self-proclaimed "ruminations." The thematic glue of the volume is change, or the need to adapt management practice and technical services organization to new technologies and environmental conditions.

Overall, the work includes a strong group of contributors. Bill Gosling provides a useful overview of management challenges that arise at the operational level with the introduction of new technologies. Arnold Hirshon proposes a new "world view" for technical services, and for libraries generally, that focuses on the external environment. Hirshon contrasts internally and externally focused views in terms of organizational design, planning, staffing, collections and access, and bibliographic systems design. Sharon Walbridge discusses new partnerships within the library that technology both enables and requires for effective management. Delmus Williams contributes a speculative essay that touches on various issues related to technical services and change.

In a brief but useful chapter, Ken Berman discusses technical services from the neglected viewpoint of the public library. Olivia Madison analyzes several issues in bibliographic access in the online environment from a cataloging perspective, giving special attention to approaches to analytical access.

Two especially substantive and useful chapters are contributed by Wayne Perryman and Jennifer Younger. Perryman surveys recent developments in technologies

SPEC Kit 166 grapples with several weighty issues facing acquisitions librarians and other library administrators today. The budgeting process is affected by rising costs, shrinking budgets, and new technology. Managing funds for maximum benefit is a challenging responsibility. To that end, equitable distribution of funds (including allocation formulas), monitoring fund balances, and accountability are becoming increasingly important. The results of a Systems and Procedures Exchange Center (SPEC) survey sent to 108 academic library members of the Association of Research Libraries (ARL) in fall 1990 are presented in this kit as an aid to dealing with these management concerns.

The scope of this book is broader than the title indicates. Considerable space is devoted to collection development and materials selection policies in the area of machine-readable data files (MRDFs), also referred to as electronic resources or computer files. The reason for inclusion is the impact of MRDFs on financial planning for libraries. Related direct and indirect costs, such as staff, training, equipment, and security, constitute substantive considerations in the budgeting process.

Other factors receiving attention in the materials selection policies are whether MRDFs provide improved access to information if that information is already available in some other format, the number of users, and whether a common vendor is chosen, thus facilitating the use of similar searching protocols. All policies advise employing extreme caution when substituting MRDFs for printed information.

"Allocation Principles" from the State University of New York at Buffalo provides an interesting example of a guide for the distribution of acquisitions funds. Goals, process, and fiscal contingencies are clearly delineated. Another budget procedure, the University of Toronto's "A Mechanism for the Protection and Establishment of Library Acquisitions Budgets," is noteworthy in that it attempts to protect the acquisitions budget from reduction in real purchasing power each year by adjusting for price inflation and currency fluctuation, both serious problems for acquisitions librarians and other library administrators today. An end-of-the-fiscal-year "Fund Report" from the University of Miami and a detailed "Preliminary Estimate of the 1991/92 Serials Commitment" from Brown University round out the collection of budget procedures and reports.

A sample agreement for the acquisition and placement of a financial data base in the Graduate School of Management of the University of California, Riverside, is an excellent example of such a policy and one of the first to be published anywhere. A short list of "Selected Readings" completes the volume.

SPEC Kit 166 is an essential purchase for acquisitions librarians, collection de-
development coordinators, and library administrators involved in the budget and allocation process. The principal flaw, a few blurred lines of print on page 38, is negligible. — Nancy Myers, University of South Dakota, Vermillion.

**Nitrate Won’t Wait: A History of Film Preservation in the United States.**


Anthony Slide, who has written numerous works of film scholarship, worked with the American Film Institute and the Academy of Motion Picture Arts and Science’s National Film Information Service. Since 1980 he has been a freelance writer and researcher, describing himself as “a working film scholar, one who makes his living by writing, researching and lecturing on film history, without the aid of grants or academic affiliations.”

Slide begins his account with the statement that “this is a factual account of the history of film preservation in the United States, but it is also a highly opinionated volume. The opinions are my own (although shared by quite a few others)” (p. ix). The well-written story he tells will interest preservation librarians, film historians, and film buffs, as well as students of politics and bureaucracy.

Nitrate film, chemically unstable and in a perpetual state of decomposition, was used from 1899 until the mid-1950s, when it was supplanted with cinematographically acceptable safety films. Thus, film preservation and nitrate film are largely overlapping problems. In eleven lively chapters, Slide describes the individuals and organizations involved with film preservation, successful and failed projects, and countless political and bureaucratic obstacles. The story is rounded out with a discussion of newer techniques and alternatives, including videotape, itself a preservation problem, and a chapter on colorization. Eight appendixes and no fewer than four bibliographies complete the work.

The author’s final paragraph provides a vivid summary: “The fate of the holdings of America’s [film] archives rests as much in future technologies and future fund-raising efforts as it does in the activities of past and present archivists. Like the Library of Alexandria, the American film archives may well be curating collections of films whose ultimate survival still remains in doubt” (p. 161). —Lawrence Auld, East Carolina University, Greensville, North Carolina.

**WORK CITED**


This slim volume brings together the results of the Colloquium on Preservation Issues in Medieval Studies held at the University of Notre Dame in March 1990. Sponsored by the Commission on Preservation and Access, with support from the Medieval Academy of America and the Notre Dame College of Arts and Letters, the Colloquium consisted of twenty-two participants who discussed how best to preserve resources critical to medieval studies. The volume includes an introduction, lists of participants and topics, seven papers presented during the Colloquium, and an epilogue.

*Why should medievalists be concerned about preservation? Many of the centuries-old primary sources are in excellent condition, and as Luke Wenger remarks in his paper, “the thought of choosing not to preserve even a single manuscript fragment is too scandalous to be considered” (p.12). The concern here, according to Mark D. Jordan in his introduction to the volume, lies with the invaluable secondary sources printed on acidic paper from the nineteenth century. To illustrate the growing problem with these sources, several participants sadly described how books essential to their research fell to pieces in their hands. Having recognized the perilous condi-
tion of these materials, the next step is to identify those sources worthy of preservation, no easy task, since medieval studies encompass a broad spectrum of disciplines. In their respective papers, Madeleine Caviness, an art historian, Christopher Kleinhenz, a specialist in Italian studies, and Michael E. Marmura, a scholar of Islam and the Middle East, each make suggestions on what materials should be preserved. All agree that some sort of bibliographic control of medieval sources is needed; once this control is achieved, the most critical materials can be earmarked for preservation.

The last two papers in the volume are by participants experienced in preservation issues. Milton McC. Gatch describes the Preservation Project of the American Theological Libraries Association. Susanne F. Roberts offers some practical proposals on how to organize a preservation program for medieval sources. The volume's epilogue presents the Colloquium's final outcome: the formation, by the Medieval Academy's Executive Council, of a Committee on Library Preservation. Among the charges to the committee are identifying the collections that should be preserved and advising institutions on their preservation projects.

The Colloquium on Preservation Issues in Medieval Studies represents a serious effort to find a satisfactory solution to preserving medieval sources through the coordinated efforts of medievalists and the library community. The volume will be of some interest to preservation officers within academic research libraries, but its greatest appeal should be to scholars of other academic disciplines who must face the need to preserve their own crumbling sources before it is too late. — Margaret E. Doott, East Carolina University, Greenville, North Carolina.


It has been fourteen years since the 1978 publication of the second edition of Cabeceiras's basic handbook on library acquisition and use of nonbook media. The third edition continues to be unusual in its treatment of all media as equal library resources.

The organization of this new edition follows closely that of the previous editions. The first five chapters consider general approaches to the selection of media, including policies, selection aids, systems approaches, and selection of the appropriate medium. Chapters on specific categories follow: motion picture films, filmstrips and slides, audio recordings, television, computer technology, maps, re- alia, and microforms. The final chapters cover local processing and issues of copyright and intellectual freedom.

Each chapter has been updated to some extent, but not enough. The chapter on audio recordings, for example, includes timely information on compact discs but includes virtually the same information on LPs as the second edition did. The second edition's chapter on programmed instruction has become the third edition's chapter on computer technology; however, this chapter's bibliography of selection aids is already out of date, since most titles date from the early or mid-1980s. Videorecordings are only briefly addressed in the chapter on television, while filmstrips are given an entire chapter. The final two chapters on fair use of copyrighted materials and intellectual freedom have been updated and are excellent.

Typographical errors, noted by many reviewers of the second edition, continue to plague the third edition. A major error, found in the bibliographic selection aids at the close of most chapters, is the listing of serial titles as monographs, with single dates; thus, these bibliographies appear even more outdated than they actually are.

The appropriate audience for this third edition seems to continue to be library schools and instructional media programs, but with reservations. Other librarians will find it of only limited use. The setting will seem too general for most individual libraries, whether school, public, or academic. In this rapidly changing area of librarianship, many specifics on changing media are already outdated. This book is not recommended.—Mary Margaret

ATTENTION ALL LIBRARIANS AND LIBRARY ADMINISTRATORS: This book is not for catalogers only. It should be required reading for all. Of special interest is the section titled "A Symposium on the Future," which has thought-provoking information regarding the future of access to library materials in the years ahead.

In 1988 the Anglo-American Cataloguing Rules, 2nd ed., revised (AACR2R) was published uneventfully. It met with little opposition, in contrast to the uproar that greeted the publication of AACR2 in 1978. This revision, which incorporates three packets of changes that were distributed earlier in 1982, 1983, and 1985, was an important event in the eyes of catalogers, who over the ten-year period, were conscientiously inserting all of these changes into what were now bulging copies of AACR2. The 1988 revision (AACR2R) incorporates all the previously introduced revisions into one complete compact volume.

In the foreword to this book, Karen Muller, executive director of ALA's Association for Library Collections & Technical Services (ALCTS), introduces the goals of the book when she states, "The essays in this book provide insights on how the descriptive cataloging challenges of the past have been resolved and point the way for resolving these future issues...If the discussions of the past are any indicator of the future, the basic principles will remain the same and will be part of the cataloging standards continuum that is as old as our profession" (p. vi).

In order to accomplish these goals, editor Richard P. Smiraglia has taken the content of a program session from the 1988 ALA Conference, titled "AACR2 Revised: Past, Present and Future," and the presentations of a series of regional institutes, called "AACR2 Revised: A Practical Update," and combined them into this volume. Smiraglia reminds us that AACR2R is a pragmatic code and that "Its rules are broad guidelines that embody solid principles and are intended to be applied by professional people exercising their own bibliographic judgment as individual cases demand" (p. ix). Many of us are unaware of the popularity of AACR2 as "an important literary property and a best-selling book. ALA sold 87,574 copies of AACR2 and, as of this writing, 54,250 copies of AACR2R have been sold" (p. ix). The title has also been translated into Arabic, Finnish, French, Japanese, Korean, Malay-sian, Norwegian, Portuguese, Spanish, Swedish, and Urdu. Although Smiraglia and others have claimed that this is a new edition in the technical sense of the word, because it represents a new impression with significant textual alterations, he concedes that Michael Gorman "has quite rightly pointed out that the revision does not represent a professionally wrenching paradigm shift and that it is entirely appropriate to refrain from calling it AACR3" (p. x).

Part 1 of the volume provides historical cataloging perspective and contextual information. It contains a "Summary of Changes in AACR2 Revised" by Olivia M. A. Madison, which describes the editorial revisions, the expansions of provisions already in the code, and the actual changes between AACR2 and AACR2R. Richard Smiraglia, in "The Continuous Revision Process," describes the representative process that is deliberately followed in order to assure broad support and to avoid surprises as the rules change. The Australian experience is offered in Elaine Hall's "The Third 'A' on ISCAACR." Part 1 ends with Ben R. Tucker's description of the major role of the Library of Congress in the revision process.

Part 2 constitutes the adaptation of the AACR2R cataloging workshops mentioned above. Olivia Madison, Ben Tucker, and Edward Swanson discuss the changes in Part 1, "Description," and Carlen Ruschoff discusses the changes in Part 2, "Headings, Uniform Titles, and References." This entire section incorporates descriptions of the exact rule changes, complete with excellent examples that il-
I illustrate the application of the changes. This is not only valuable as a review for seasoned catalogers but most useful for students in the cataloging environment. "A Symposium on the Future," which looks specifically to the future of descriptive cataloging and AACR, makes up Part 3. Michael Gorman, editor of AACR2R, investigates "After AACR2R: The Future of the Anglo-American Cataloguing Rules." In this paper Gorman advocates a new approach in a system possibly called "MARC III" or "HYPERMARC." This system would link bibliographic description with subject authorities that pertain to the work to which the various physical manifestations of an object are connected. His assessment is that such a major change is very remote. He offers three practical suggestions for the revision of AACR2R: (1) eliminate the fragmentation that AACR2R carries from previous codes; (2) get rid of the absurd rules governing legal materials, music uniform titles, and the Bible; and (3) accommodate changes brought about by new technologies.

Responses to Gorman's thesis are offered, together with their own views of the future, by Michael Carpenter, Sheila Intner, Pat Thomas, Barbara Tillett, and Arnold Wajenberg; Gorman responds briefly to each.

Carpenter's observation that "the profession should create a new cataloging code, now, for the online age, before the database management technology for a new generation of online catalogs has finally arrived, and old ways of thinking are even more hopelessly embalmed in large files" (p. 101) is based on the premise that cataloging theory rests on the mistake of a fixed form display, such as one form of an author's name or one particular title or uniform heading. Carpenter suggests the creation of a cataloging code for the online age. Wajenberg agrees with Gorman's ideas and offers practical advice on the cataloging of photoreproductions and unpublished materials. In her paper, Tillett wishes for a future MARC brought about by a revolution but, realistically, is more "optimistic about a slow evolution where we keep in mind a clear direction for improvement" (p. 117). Intner rejoices at the thought that the main entry will "wither away and disappear" (p. 119). She agrees with Gorman that AACR2R is the best set of rules for cataloging so far but realizes that they suffer from the separation of materials into outmoded media groupings and the enumeration of all possible cases for classes of data. Her advocacy of simplification as the primary objective of code revision, together with the application of logic, consistency, and uniformity, is a welcome and practical suggestion.

Thomas does not respond to Gorman's paper, offering her own vision of the future, which she also sees as change through evolution, not revolution. She envisions libraries still full of books and other materials, with a need for a cataloging code of some kind so these materials can be accessed.

The true value of this volume lies not in its contribution to the cataloging world, to which it introduced AACR2R via an ALA conference and regional workshops, but in its critique of current cataloging, its insight into the future world of cataloging, and its assessment of how progress, or lack thereof, will seriously affect access to library materials. It is for these reasons that I recommend the final section of this book as required reading for all librarians and library administrators.—Elaine K. Rast, Northern Illinois University, DeKalb.


In 1991 the Association of Higher Education Facilities Officers Association of Physical Plant Administrators (APPA), in cooperation with the Commission on Preservation and Access, conducted a seminar on library and archival facilities and environmental controls to which both librarians and facilities managers were invited. Because the environment has perhaps the single greatest effect for good or ill on library materials, pursuit of increased understanding between librarians and the people responsible for maintaining our facilities is essential. The APPA and the
Commission are to be commended for taking a step toward our better communication and cooperation.

This small book serves, in effect, as the proceedings for the seminar. Versions of seven of the papers were presented at the meeting; several other presentations are not included here. The introductory piece was written originally for Facilities Manager.

As with the seminar, the book's intended audience is both librarians and facilities managers; librarians will find some new information on environmental controls and facilities mixed with a familiar litany of preservation concerns. The first three papers, by Banks and Harris, Frye, and Kelsey, discuss the library context and the value of library materials, explaining the basic sources of deterioration of those materials and the effects of light, heat, and humidity. Current guidelines for environmental controls are described, and the need for two-way communication between librarians and facilities managers is stressed.

Four papers from the facilities management community offer less familiar fare. The papers of Stuebing and Wink describe the issues involved in design and maintenance of a properly functioning environmental control system and explain why it is so difficult to achieve the recommended levels for temperature and humidity. Dunn presents an introduction to integrated pest management, a technique to minimize infestations through careful monitoring and housekeeping without heavy use of pesticides. Wilson covers fire protection and prevention, including a strong call for the installation of sprinklers. The final paper is a case study in communication, a dialogue between Smithsonian librarian Gwinn and facilities manager League over several years as they learn to understand each other's problems and needs. A three-page bibliography contains items on brittle paper and other preservation concerns, physical plant issues, and a few titles on organizational communication.

Given the nature of the volume, it offers little room for in-depth treatment of the topics, while containing inevitable repetitions. Those desiring to follow up with a more detailed and concentrated introduction to the subject are advised to consult Lull's Conservation Environment Guidelines for Libraries and Archives (University of the State of New York, State Education Department, New York State Library, Division of Library Development, 1990).—Janet Gertz, Columbia University Libraries, New York.


The focus and technology of the library are changing. The focus is now the user, not the collection or the tools for accessing the collection. Through the adoption of the information literacy goals, library instruction is undergoing a similar transformation.

Teaching Technologies in Libraries captures this change in an easy-to-read and understandable format. It takes the instruction librarian, beginner and advanced, forward in the quest to improve instruction by presenting how this can be done using technology. The purpose of the book is to serve as a practical guide to the technologies now available. It does this and goes beyond by providing the fundamental concepts for how to design all instruction. Each chapter is well constructed and organized. The concepts introduced are well documented from the user education literature, with additional references from the education and technology literatures. The suggested readings in each chapter are a valuable resource for further investigation. Also included are well-selected examples of existing programs presenting what has been done and how it worked.

The book begins with an excellent overview of the current issues and theories concerning technology and how users learn. Next is a general chapter on how to select from the options available. The next three chapters deal with help screens, optical disks, and online tutorials from commercial services. Each details how to judge their effectiveness and when and how to improve them, reminding us at the same time that the tools themselves can be excellent instructional resources.
The strengths and weaknesses of video, computer-assisted instruction, expert systems, and hypertext are treated in following chapters. The information provided clearly reflects a great depth of experience and understanding on the part of the authors, not just theoretical knowledge. Especially helpful in these chapters is the attention given to development time and costs. Also useful are the detailed lists of authoring systems and programs, with purchasing information provided. The last two chapters deal with special users and future technologies. Even though these are the weakest chapters, they do deal in broad brush strokes with important topics.

In summary, the book draws mostly from academic library experience, but it should be owned by all instruction librarians, including technical services librarians who participate in library instruction.—Carla J. Stoffle, University of Arizona, Tucson.
From Bella Hass Weinberg, Professor, Division of Library and Information Science, St. John's University, Jamaica, NY:

I read with interest Jane Treadwell's letter in the October 1992 issue of LRTS, in which she expressed her disappointment that an article of hers that had been published in Library Journal was not cited in the review of the year's work in serials. At the time her letter appeared, I had just completed a paper titled "How to Make an Impact in the Field of Library and Information Science" for presentation at the Annual Meeting of the American Society for Information Science (ASIS). In the paper I made the point that popularization of research is essential and that an excellent way to achieve this is to publish in Library Journal. (John Berry III, Editor in Chief of LJ, was a reactor to the paper at the ASIS conference.) Ms. Treadwell's experience, however, seems to provide counter-evidence, i.e., because her study was not published in a "scholarly" journal, it was not cited.

I, too, have noticed over the years that relevant articles are not covered in LRTS reviews, even if the journals in which they appeared are indexed in the standard sources. My impression is that some reviewers go through the core journals for the field that they are covering and do not do literature searches. A review in the July 1992 issue of LRTS that supports this impression is the one on the literature of acquisitions; the works cited in the bibliography derive from a small number of journals and collections. Bradford's Law of Scatter suggests that the literature on the topic would be dispersed in a large number of journals, and indeed, perusal of Library Literature 1991 under the heading Acquisitions confirms this.

Papers in specialized library periodicals often seem not to be covered in "The Year's Work" issue of LRTS. For example, while a paper that I was invited to contribute to the special religion issue of Library Acquisitions: Practice and Theory was cited, many relevant articles from Judaica Librarianship have been overlooked, despite its coverage by indexes.

I suggest that each review paper in LRTS begin with a statement of its scope and coverage (e.g., research articles only, no technical reports) as well as a description of the literature search (e.g., Library Literature and LISA for the period ____, using the search terms ____). This would allow an author of a seemingly relevant article to determine whether it was not cited in a review because of a format limitation, a problem with indexing/search terminology, or a lag in index coverage.

In recognition of the last problem, combined with the pressure to publish the review issue of LRTS in a timely fashion, I suggest that the authors or editor adopt a technique that is employed by the editor of the Annual Review of Information Science and Technology (ARIST): sending out an announcement of the themes to be covered in the forthcoming volume and requesting that authors of relevant papers submit them to the reviewers. The "Year's Work" issue of LRTS has annually recurring themes, so it is an easier annual review to manage than ARIST, but I have never seen a solicitation of relevant documents in either LRTS or the ALCTS Newsletter.

I have heard that there is a plan to split out "The Year's Work" issue of LRTS into a separate volume. If this will be sold separately and not automatically sent to all ALCTS members, I predict that the new annual review will have far less readership than "The Year's Work" issue of LRTS. (An informal poll of ASIS members revealed than a tiny percentage read ARIST, which is also sold separately.)

The contributors to LRTS have expertise in the identification and acquisition of materials on a topic and in the creation and searching of catalogs and indexes. This expertise should be evident in the reviews of the literature of technical services. A description of the methodology employed in the compilation of such reviews would constitute both an interesting and educational component of these important articles.
Instructions for Authors

Manuscript Submission

Manuscripts of articles should be sent to the editor, Richard P. Smiraglia, Palmer School of Library and Information Science, Long Island University, Brookville, NY 11548; (516) 299-xxxx; fax (516) 299-xxxx; e-mail smiragli@liuva,x.

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 should be machine-printed and double-spaced. Three copies should be provided. Disk copy will be requested from authors for accepted articles.


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 and subtitle (if any), 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 notes and 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 15.4 for text references; 16.5 for bibliographic style). Verify each citation 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

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, July 1, 1991.

PURPOSE

The purpose of LRTS is to support the theoretical, intellectual, practical, and scholarly aspects of the profession of collection management and development, acquisitions, and technical services 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 is 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 over the volume each of the sections of ALCTS (Acquisitions, Cataloging & Classification, Collection Management and Development, Preservation of Library Materials, Reproduction of Library Materials, and Serials) is represented in the journal. Articles on technology, management, and education are appropriate to the journal when the application of these is to issues of interest to practitioners and researches 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 in the profession of collection management and development, acquisitions, and technical services by reporting the results of research or other scholarly activity.
2. Periodic literature review essays that discuss issues and trends of interest to the membership of ALCTS.
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 of interest to the membership of ALCTS.
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.
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