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Guest Editorial:

When Is a Professional Not a Professional?
or, Us versus Them!

A dichotomy has evolved in library services. Largely for historical reasons, this dichotomy is usually referred to as Technical Services and Public Services. When some professional librarians gather from either group, the dichotomy may be referred to as “front room versus back room” or “us versus them.” Most significantly, the tone of voice will often drip with sarcasm and superiority. The conversation of either group may be punctuated with comments such as, “What do they know about . . . ?” or “If only they understood that . . . ;” or “If they only listened why . . . , then . . . .” It is possible to build quickly a list of issues that are frequently discussed by professional librarians (this list is easily expanded—try it by filling in the blanks).

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The elitism that can begin to invade a group of librarians, whether they are from Technical or Public Services, can develop, if unchecked, into a form suggesting that one group is more “professional” than another. Or, if you will, a form of caste structure can begin to develop within librarianship. Thus, class or caste lines are drawn within the profession. Symptoms of this “superprofessionalism” are evident within some libraries; for the purpose of illustration, I will discuss two cases in more detail.

The first involves the relative priorities of the various library functions within the context of selecting an automated library system. Put more bluntly, the issue is who controls the decision-making process?

Because of the historical availability of bibliographic utilities and the need to complete retrospective conversion prior either to automating circulation control or providing an online catalog for direct patron use (after all, a computer engine requires fuel—bibliographic records), technical service librarians are typically the first within a library to begin coping with automation. In this case, these librarians have needed, at least at some level, to master the details and vagaries of the MARC record. Thus, they became—almost by default—the pioneers of library automation. And, as most pioneers will do, they began to speak of their coping battles and wars and of conquest against that oft-feared nemesis, the computer. But, unless you, too, are currently dealing with this same topic, the stories and victories become, not a source of information, but a source of frustration, bore-
dom, and separation. ("Oh no! Judy is going to tell another one of her MARC stories.")

Yet once retrospective conversation is completed and the library looks toward internal automation, the process of deciding what kind of computer system to install becomes an important issue. A library director often will quickly come to the conclusion that the automation project director should either be the head of Technical Services or someone from that department who is knowledgeable about automation. Issues of control or the most suitable kind of automated system may never be discussed explicitly. And, without a specific discussion and decision process, the specifications for the automated library system will, not surprisingly, tend to favor those working in Technical Services. Even if there is discussion, followed by a decision that the most important components within the system are the online catalog and the circulation control module, for example, there have been numerous examples of requests for proposals in which the sheer number of specifications and requirements for cataloging and database-maintenance functions clearly overwhelm the requirements and specifications in other areas. This, in and of itself, is not necessarily bad, but there must be an explicit understanding and conciliation, as part of the evaluation process, that balances the superior number of specifications with the smaller number for other, more important modules. In many libraries, the evaluation process merely consists of adding up the number of positive responses to all of the specifications to determine the "most responsive" vendor. Thus, those directing the system-selection process have either consciously or unconsciously altered and subverted it to favor a Technical Services-oriented system. The obvious question is whether such a selection is in the best interests of the library, especially if library is defined from either the patrons' or staff members' perspective.

The second illustration concerns the authority control file that is a part of a local automated system. The value of an authority control file has been well established in a wide variety of studies that demonstrate a clear and direct relationship between the number of cross-references and the success of catalog searching. The majority of automated systems with authority control capabilities can locate the ability to add and edit authority control records at any staff member's terminal. Reference librarians are on the firing line, interpreting the user's search vocabulary on a daily basis and matching this almost constantly changing and evolving terminology to the precoordinated vocabulary of author names, subject headings, uniform titles, and series. As such, reference librarians have a unique opportunity to keep the authority control file in a timely manner.

The issue then comes down to whether all staff members, assuming appropriate training in the use of the system, will be allowed to manipulate the authority control file. If access is restricted to a select few, who are all located within Technical Services, the result is the "elite" professional restricting access to other "peer" professionals. Some within the Technical Services environment make the point that restricting access improves the authority control file and helps prevent corruption of the database. This may or may not be the case, as control can be achieved with a variety of techniques. Asking reference librarians to complete a small, paper form that requests the Technical Services department to add or modify a cross-reference implies, or has the potential for implying, that reference librarians are second-class professionals who are not to be trusted.

The point of this editorial is that automation has the potential for breaking down the communication barriers that exist, or may exist, among library professionals. By itself, automation does not imply a particular course of action but is a tool that can be exploited to achieve many goals. The real question for the library profession is, What are the goals that automation should achieve in any given library? Implied within this question is another: When is a professional not a professional?—Joseph R. Matthews.
Interaction:
Letters to the Editor

From Ruth Jean Shaw, Manager, Anchorage School District/Library (Alaska):
The January 1988 issue . . . does not acknowledge the wonders of WLN’s LaserCAT in . . . “Resources & Technical Services News: CD-ROM Takes Center Stage.” LaserCAT is a CD-ROM tool serving libraries in the Pacific Northwest complete with holdings attached. . . . [I]t is important to share with the entire library community the features of a remarkable CD-ROM product from WLN . . .

From Elizabeth Morrissett, Library Director, Alaska Pacific University:
After nearly fifty years in librarianship, it is amazing to still find writings in the subject interesting, even so engaging that I respond.

Yes, there is too much organizing of ALA by trees—subdividing and subdividing so that every variety of library association has its own little group on collection building and cataloging.

It is so important that we recognize that catalogers cannot function without the input of the public service area—public service is paralyzed without intelligent cataloging. The best combination is the sharing of these functions by subject specialists . . .

I was disappointed by the article on CD-ROM that . . . ignores the really significant product of the WLN (Western Library Network). It has had the CD-ROM cataloging and reference and searching software/hardware combo in use for over a year . . .

The real essence of cataloging is the close mating of reference needs with the reality of publishing . . .

Many thanks for the good work of your editors.

Editor’s reply:
Thank you for the information about the Western Library Network’s LaserCAT. It is not LRTS’ or columnist Urbanski’s intention to exclude any vendor or product from “Resources & Technical Services News.” The column is LRTS’ effort to inform RTSD members/readers of relevant news we receive about new products and services via vendor press releases. Had WLN sent out information on the topic being covered, it, too, would have been included.

No research is done to ensure that all products of a type are included. The time and effort it would take to do such research would make the column impossible to write within the time frame a volunteer columnist has available.
From Joycelyn Claer, Catalog Librarian, Kilgore College (Texas):

How fortunate for me that I read [the editorial] "Catalogers: The People We Love to Hate" (LRTS 32, no.2:101-2). . . . Otherwise, I might never have known what a wretched self-image catalogers possess, or that, as a cataloger, I am merely an uncreative blob performing unappreciated, intellectual exercises. What a pie in the face! . . . I can readily perceive from the editorial that discussion degenerated into a gripe session. . . . I refuse to succumb to blatant negativism. My technical services staff gladly give service to students, willingly show courtesy to faculty, purposefully reach out to administration, and gleefully gather in compliments. If the common sense problem of self-esteem and job satisfaction merits a panel discussion, at least attack the problem in a positive way.

From Jack Perry Brown, Director, Ryerson & Burnham Libraries, Art Institute of Chicago:

Although I dread involvement in a discussion of subject headings, which are by definition subjective, I must comment on the article by Alexandra Herz on "Scientific Illustration" (LRTS 31, no.3:239-47) . . .

The author's suggestion of "Anatomical illustration—History" for Leonardo and Vesalius, a heading that is non-LCSH but "easier and more accurate," misjudges what their books are: they are not histories, but historic, i.e., early works to 1800 . . .

To put Audubon under "Birds—Pictorial works" is a perfectly suitable iconographic approach. Muybridge was as interested in the utility of his works for art students as for other purposes—thus "Anatomy, Artistic—Animal" is a useful heading. When his book Animals in Motion was cataloged in 1957 . . . it is a broad but safe statement to say that art historical interest in photography was nearly nonexistent. Of course none of the books under "Art and Science" are about illustration—that isn't what the heading means . . .

I could go through every heading mentioned in this article, and offer a contrary point of view . . . All this article says to me is that the author didn't find things where she thought they would be and would substitute her biases and training for that of others.

Editor's reply:

Your interest in and opinions about "Scientific Illustration" are appreciated. At issue, perhaps, is the idea to which catalogers subscribe that a subject heading should convey what a book is about, not what it is. For this reason, we do not assign the heading FICTION to individual works of fiction, or BIBLE to Bibles. Laypersons (i.e., nonlibrarians) may be unaware of the distinction, especially because we are not always consistent but sometimes do assign headings describing the nature of a book, not what it is about (e.g., we assign FICTION to collections of fictional works).
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Bibliography, Library Records, and the Redefinition of the Library Catalog

Michael K. Buckland

Compared with bibliographies, library catalogs (whether in books, on cards, or online) have significant disadvantages from the user’s perspective. Bibliographies, however, unlike catalogs, provide no indication as to where the text itself may be found. The modern catalog can be seen as a response to the limitations of nineteenth-century library technology, which is no longer the technology of choice. A fundamental reconsideration of the relationships between bibliographies, records, and catalogs is overdue. The modern library catalog, fundamentally obsolete in an online world, is in need of major redefinition.

Computers are being used increasingly for library records, for online catalogs, and also, though mainly outside of libraries’ technical systems, for bibliographies (“online reference”). All three were previously handled on paper or cardboard. The shift in technology provides an opportunity to reconsider the relationships between the three and raises a serious question regarding the continuing justification of the catalog as it is currently designed.

BIBLIOGRAPHY

The term bibliography is used in several ways to denote the study of books and the making of descriptions of books. In this discussion we are concerned with bibliography as the making of lists of books, articles, and other documents—by subject, author, and other attributes—and the making of indexes of those “lists.”

Bibliography is perhaps the best available term for the whole apparatus of access to records of all kinds: textual, numerical, visual, musical, etc., in all kinds of storage media: books, journals, microforms, computer disks, etc. Examples of the sorts of bibliography under discussion include Chemical Abstracts, Annual Review of Information Science and Technol-

Michael K. Buckland is Professor at the School of Library and Information Studies, University of California at Berkeley.

The author is grateful for the helpful comments of Samia Benidir, Brett Butler, John Gathegi, Clifford Lynch, Dorothy McPherson, and Patrick Wilson.
ogy, *Books in Print, Readers’ Guide to Periodical Literature*, and *Arts and Humanities Citation Index*.

The components of this bibliographical universe are numerous as well as varied. Besterman’s *World Bibliography of Bibliographies* lists 117,187 bibliographies and is an incomplete enumeration of separately published bibliographies.

An important feature of bibliography in this sense is that it is primarily concerned with titles and works rather than with individual copies. A bibliography on academic freedom might well include a reference to David P. Gardner’s *California Oath Controversy*, but the reference is to the work, and usually to a specific edition of the work. Bibliographies are not ordinarily concerned with specific copies of an edition. Information about copies is included only in exceptional circumstances: one copy is somehow different, a bibliographical variant or perhaps the only extant copy. For rare materials and early printing, it is customary to note where individual copies can be found or which copy was inspected by the bibliographer. As a general rule, bibliographies deal with published works rather than individual copies and therefore are of general interest to anyone who might benefit from knowing about the works. For this reason publication or public access to bibliographies is highly desirable.

Bibliographies, especially continuing ones, lend themselves well to computer-based production, which reduces the tedium of the mechanical tasks: sorting, cumulating, updating, rearranging, and indexing a large number of individually brief references. Once preparation of the bibliography is computer-based a logical next step is to make the bibliography available online.

Analysis of library expenditures for 1984–85 in the nine University of California campuses indicates that the eight most heavily used online bibliographies were *BIOSIS (Biological Abstracts)*, *CASEARCH (Chemical Abstracts)*, *DOE (Department of Energy)*, *ERIC (Educational Resources Information Center)*, *INSPEC (Institution of Electrical Engineers)*, *Medline (National Library of Medicine)*, *NTIS (National Technical Information Service)*, and *PSYCHINFO (Psychological Abstracts)*. It is reasonable to expect the number of bibliographies that are available in machine-readable form to increase and for them to account for a growing proportion of all bibliography use. It is also reasonable to expect that these bibliographies will become available in more different ways: through commercial database services, as tapes that can be loaded at computer centers, or on optical, digital disks, such as CD-ROMs, attachable to microcomputers.

The next logical development would be to provide links from the reference in the bibliographies to libraries’ holdings records. If one were to find an interesting reference to an article while searching *Chemical Abstracts*, for example, it would be an obvious amenity if one could move automatically from the reference to a statement of local libraries’ holdings of the periodical concerned—and, ideally, could know whether that particular volume is out on loan and/or whether to send a request for a copy of it.

**LIBRARY RECORDS**

At an opposite extreme, the records needed for library operations concern individual copies of documents.
A circulation system must know precisely which copy of which volume of which edition of which title was borrowed by precisely which borrower and when it is due back. Attributing the loan to some other borrower will not do; nor will substituting the return of some other document, even by the same borrower, be acceptable as an end of the loan.

Acquisition records need to show precisely how many copies of a given work were ordered from which bookseller and which, if any, have been received. A library without records of which titles it already had (and how many copies) could not function efficiently.

Serials records contain minute details on copies of issues, indexes, and invoices in order to assure that each set is complete, properly bound, and paid for.

Library records, then, must be specific to individual copies. In general, it is desirable to automate library record keeping for three reasons:

1. Much of the work involves updating files of records. The tasks involved are tedious, repetitive, and mechanical in nature, even though the records may be complex and sorted in complicated ways.
2. Automation is likely to improve cost-effectiveness either by reducing the rate of cost increases in labor-intensive activities or by increasing effectiveness through more thorough performance of some tasks—such as claiming unsupplied issues of periodicals—than levels of library staffing usually permit with manual procedures.
3. Automation permits decentralized access to the records. A librarian in a branch library can verify the status of an order without maintaining duplicate files, traveling to the order department, or interrupting other staff with questions. A user can check to see whether a book is on the shelf or out on loan without traveling to the library.

Considerations of service, cost, and the humane use of staff all argue for using computers to handle library records.

**LIBRARY CATALOGS**

Catalogs, as we currently know them, are a combination of bibliography and of library records, containing both general statements about editions of works and specific statements about individual copies in particular libraries. Arguably, given the limitations of paper and cardboard technology the only practical way of achieving this linking of bibliographies and library records in the nineteenth century was to create a third set of records containing elements derived from each: the modern library catalog.

Catalogs vary considerably in format according to the technology in use: books; cards; microfiche; online. Further, if catalogs are seen as a bridge between bibliographies and records, it must be recognized as connection between two moving and changing objects that continue to evolve.

Early library catalogs were inventories of shelf content. The 1620 catalog of the Bodleian Library at Oxford University is regarded as significant because it listed books in author order regardless of where they were shelved. This, then, was the catalog as an author-ordered finding list of books.

The transformation of library cataloging to its present form occurred in the nineteenth century, when it was argued that simple author access was
not enough and that a different, more sophisticated, and more elaborate approach was needed.

The classic definition of the purpose of a library catalog is that of C. A. Cutter, who stated that the "objects" of a catalog were

1. To enable a person to find a book of which either
   (a) the author
   (b) the title
   (c) the subject is known.
2. To show what the library has
   (d) by a given author
   (e) on a given subject
   (f) in a given kind of literature (poetry, drama, fiction).
3. To assist in the choice of a work
   (g) as to its edition (bibliographically)
   (h) as to its character (literary or topical).

In effect, the new techniques of the time built a superstructure of bibliographical access on the simpler finding lists of before: complex subject headings, added and keyword entries, cross-references, systematic shelf arrangements, and so on.

The display form changed from books to cards, which are easier to update, but the principal change was local development of more elaborate access to the collection contents. Modern library catalogs remain as defined in the 1870s and 1880s.

A schematic view of the present relationship between bibliography, library records, and the catalog is as follows:

```
BIBLIOGRAPHY  -->  CATALOG  <--  LIBRARY RECORDS
```

Almost all the data needed for a library catalog are bibliographical and would be common to any catalog (or bibliography) containing the same work. The exception is the locational information: name of the specific library, call number, and details of each copy, as needed. These data would not be common to other libraries' catalogs listing the same work.

The Catalog as a Form of Bibliography

Seen from the broader perspective of bibliographic control, library cataloging is a special case of bibliography defined by the intersection of two subsets:

a. Library catalogs use one particular level of description: the edition of the monograph and the title of the periodical. More detailed (analytical) cataloging is possible and can be found, especially in small, specialized libraries, but is not typical.

b. The set of records in a library catalog is further defined geographically: those that pertain to the holdings of a collection, a library, or, for a union catalog, to two or more libraries.
It is important to stress that the limitation by level of description, which excludes levels of access commonly needed by researchers, is a matter of standard practice, not of principle. One can find excellent examples of library catalogs that also provide entries for articles in periodicals and individual contributions within books, for example, the *Index-Catalogue of the Library of the Surgeon-General’s Office, United States Army* (1880), which evolved into *Index Medicus* and *Medline*. Another published example is the *Catalogue of the Library of the Peabody Institute of the City of Baltimore* (1883–92), according to the preface: “This catalogue is constructed on the idea that the best possible catalogue is that which best makes known to the average reader the entire contents of a library. It is intended to answer the three important questions: Is a given book in the library? Are the works of a given author there? What books, articles, and information does a library contain on a given subject? A perfect catalogue would furnish complete answers to all these questions” (p. iii–iv). Technical and cost considerations, however, resulted in the general practice of omitting detailed access, especially to articles in periodicals, leaving that important role to published bibliographies.

That library catalogs are not normally thought of as bibliography is largely an accident of semantic custom and of a tradition of organization that associates the catalog with catalogers in technical services departments and bibliography with reference librarians in public services departments.

From an operational perspective, the catalog can be seen as a useful amplification of records that are needed anyway. Catalog information can be useful in a variety of ways to library staff and users. The difference between the Bodleian catalog of 1620 and contemporary catalogs is essentially that the latter have a much larger bibliographical superstructure added to the locational information.

Yet a library catalog has some significant shortcomings as a tool of access compared with published bibliographies, which are, or can be, more complete (extending beyond a given library’s collections); more selective (focusing on the interests of specific clientele and, therefore, of higher precision in the terminology of information retrieval); more capable of special arrangements (as opposed to standardized, universal schemes of classification and of subject headings); more flexible (because each new bibliography can be done differently); more detailed (indicating individual papers within periodicals, articles in newspapers, and papers within conference proceedings); more descriptive (containing abstracts of the contents); more easily deployed to cover new topics of interest as needed; more expertly compiled (because bibliographers are more likely than catalogers to be expert subject specialists); more coherent (because bibliography starts with a topic around which selected references are assembled, whereas, in cataloging, documents are assigned to subjects); and more cost-effective (because a bibliography’s usefulness is not limited to an individual library). Catalogers rebut these assertions with counterarguments that local cataloging (unlike published bibliographies) permits access to be adapted to local circumstances and inclusion of items excluded from bibliographies.
In this debate between bibliographers and catalogers, summarized by Swank, bibliographers argued unsuccessfully that the investment made in local library cataloging would be better spent on improvement of bibliographies that could be published and of widespread usefulness.

Swank subsequently wrestled with the issue of combining the advantages of bibliographies with the necessity for local records. He was unsuccessful, in the last resort, because the technology of paper and cards simply did not lend itself to the integration of bibliography and catalog. As Shera noted with regret, subject bibliography (other than cataloging) has developed during the twentieth century largely outside the mainstream of librarianship, major roles in the creation and provision of access to bibliography being played by individual scholars (e.g., Besterman); professional and scholarly groups (e.g., American Chemical Society); government agencies (e.g., ERIC, NTIS); and private firms (e.g., Bowker, Lockheed).

**TWO PERSPECTIVES CARICATURED**

The difference between a bibliographer’s and a cataloger’s perspective can be illustrated by considering how each might approach the provision of bibliographical access to, say, a chemistry library. Both scenarios are exaggerated for emphasis.

A bibliographer responsible for a chemistry library might take the view that a published bibliography of the literature of chemistry should be the user’s principal access to the universe of chemistry literature as well as to the holdings in a particular library. The strategy might be to arrange for plentiful use of Chemical Abstracts, perhaps by locally mounting a copy online, then linking the citations in it to the library’s records. Perhaps the link could be made by using the International Standard Serials Number (ISSN) for each periodical title and the Library of Congress catalog card number (LCCN) or International Standard Book Number (ISBN) for each monograph. Meanwhile the library’s records also would have ISSN, LCCN, ISBN, or similar numbers attached. (This technique is suggested as evidence that linkage is feasible. Other approaches are possible but outside the scope of this paper.) In this scenario, the library user would search Chemical Abstracts and be able, when interested, to ascertain the library’s holdings. As an option, searches could be limited automatically to entries with links to library holdings records or, alternatively, that subset with library holdings links could be separated out as an unusually detailed “catalog” of locally held material. Locally held material not appearing in Chemical Abstracts would pose a problem: such material might be contributed to Chemical Abstracts if relevant, other bibliographies would need to be used for other subjects, and some local supplementation of the files would probably be unavoidable. (This linking of a bibliography with library holdings records is being implemented experimentally, for the medical and health sciences collections on the nine campuses of the University of California, in the “MEDLINE on MELVYL” project.)

A cataloger providing access to locally held materials also might note that a traditional library catalog provides almost no direct access to the literature of greatest interest: the individual papers on chemistry, usually
published as articles in periodicals. From a cataloger’s perspective it
would seem logical and traditional to expand the cataloging to include the
articles in the periodicals received by the library—and only those periodicals.
The cataloging, based on national standards, would be adapted to local
needs. A significant concern in each library would be the maintenance
of local authority control (i.e., consistency in the use of author and subject
headings modified to suit local needs). With modern technology and the
traditions of interlibrary cooperation, costs might be reduced by using a
consortial approach to catalog construction. A shared database of catalog
descriptions of articles, technical reports, and books could be developed
for chemistry library catalogs—an Online Chemistry Library Center, per-
haps. Catalog records contributed to the database would be available for
deriving records for the local catalog. This cooperative database, with
much broader coverage than any one library’s, would be available to li-
brarians but not, in practice, to users. Chemical Abstracts would be of
greatly reduced value because it would duplicate catalog records for every-
thing in the library.

This small vignette identifies the extravagance of a catalog-based ap-
proach in comparison to a bibliography-based approach and invites more
extensive examination of the latter’s potential where catalogs are used.

BIBLIOGRAPHY OF BOOKS

Although there is no shortage of specialized bibliographies, it is not ob-

vious what could or would be used as a general bibliography of books. For
the U.S., ingredients exist in the form of various databases often vaguely
referred to as “the national database.” Obvious candidates include the cat-
alog records of the Library of Congress (LC MARC; REMARC) and the
databases created by consortia of libraries for cataloging purposes, notably
OCLC and RLIN. In addition there are commercially published listings,
such as the American Book Publishing Record, Cumulative Books Index,
and Books in Print.

Any library is likely to own some items not currently in the national data-
base, but there is general agreement that any such items should be cata-
loged and machine-readable records made available as part of this data-
base.

The “national database” in practice is currently accessible only to li-
brarians and then only incompletely. It is, however, of enormous potential
utility as a resource for both scholars and librarians. Several imaginable
actions could increase access to the bibliography of books and periodical
titles by making components of the national database more accessible. For
example, databases could be combined, published, and/or made accessible
through a “linked systems protocol”. 15 Much fuller benefit would derive if
these records were linked to local holdings statements.

BEYOND BIBLIOGRAPHY AND
CATALOG TO FULL TEXT

As of 1987, the full text of documents in machine-readable form is re-
markably absent compared with the availability of bibliographies and cata-
logs. Much of what is published exists in machine-readable form, since
authors commonly use word-processors, and printers often employ computer typesetting. The evolution of electronic publishing, as summarized by Kilgour, is in four stages: (1) preparation of text in machine-readable form that is subsequently discarded after production of paper copies, (2) publication of paper copies and in machine-readable form; (3) publication in machine-readable form only; and (4) publication of information in machine-readable form in an encyclopedia-style database. 16

The advent of text in electronic form has two profound consequences for bibliography and catalog design:

1. Card catalogs are, necessarily, physically separate from the physical (paper) documents that they describe. Given the technology of paper and cardboard, it could not be otherwise. Further, use of the documents involves physical handling, often borrowing. To the extent, however, that both catalog and text are in machine-readable form, both could be remotely accessed from the same workstation, and the former physical separation between catalog and text becomes unnecessary—or, at least, transparent and irrelevant to the library user, who should be able to move effortlessly between catalog and text. First the catalog might be searched and one or more records retrieved. The user might reasonably want next to examine the contents of a book. There is an extensive internal structure of references: from the table of contents to chapters and sometimes sections within chapters, from the index entries to numerous points in the text, and often from one part of the text to another. Texts in electronic form with this connective apparatus are known as "hypertext."17 In an online world the user could move to the table of contents by depressing a key, then go on to examine a chapter. Next, the user might want to look for specific terms or names in the index, online, thence to specific patches of text, again online. Since the text is online, one could expect a concordance providing access to all of it. The user might abandon that text, follow up a reference (from inside the text or from a citation index) to another text, go back to the catalog records to look for another book, or scan the subject headings with a view to reformulating the search. A continual change between the broad view and focus on details is possible. The system would have what Kochen has described, by analogy with a camera lens, as "zoomability."18 The familiar data elements of the catalog record will not disappear, but rather the catalog will disappear as a separate entity. Instead, catalog data would be part of a much broader set of data elements, and the catalog function would be one feature in a suite of related functions in online library use.

2. The traditional justification for having a catalog begins to disappear. Historically, a library catalog was a guide to local holdings. Yet what matters to a library user is convenient access to texts. With documents on paper, what is locally owned is conveniently accessible. (In practice, library users typically cannot find 40 percent of locally owned material when they seek it.)19 With convenient telecommunication, however, the physical location of an electronic text is substantially irrelevant. Databases (which are copied, not borrowed) at a
distance are likely to be more reliably accessible than paper documents owned by one’s local library. What is needed, then, is a bibliography of what is conveniently accessible rather than the much narrower concept of a catalog of what happens to be locally owned.  

**Toward a New Synthesis**

How should the identification-and-location function be approached in the future? To the extent that the card catalog was a product of the limitations of now-obsolete technology, the development of even the most sophisticated electronic version of the card catalog could represent misguided creativity, reminiscent of the continued refinement of sailing ships after steam became the preferred source of power. Instead, we should stand back from the catalog and start with first principles.

Three elements—bibliographies, library records, and texts—are needed: bibliographies will continue to be published, libraries must have their copy-specific inventory and status records, and texts are becoming available in electronic form. Computer-based procedures enable records to be linked in ways previously infeasible.

The following approach is suggested:

1. Since bibliographies constitute the principal means of identification, there should be extensive, convenient access to bibliographies regardless of technology.

2. Because it is necessary not only to identify but also to locate material, it should be possible when searching bibliographies to ascertain how to get to the texts, whether by knowing call numbers and availability of local library holdings or by access to online databases.

3. It would be convenient to have an option whereby searches in bibliographies could be limited to the holdings of one or more particular libraries.

4. In order to achieve the central mission of libraries, providing access to information, references in bibliographies should also link directly and permit immediate reference to machine-readable full text or, otherwise, to request that copies be sent in the original, in photocopy, or by telefacsimile.

These relationships can be represented as follows:

```
BIBLIOGRAPHY ←→ LIBRARY RECORDS

TEXT
```

The technical and “architectural” aspects of achieving such links are outside the scope of this paper. However, there appears to be no technical reason why access to online bibliographies and union catalogs should not extend to convenient access to documents. Who would want to settle for less?

The use of computer-based techniques to achieve the goal of extensive bibliographical access combined with physical access to electronic text (or call-number and availability information for paper documents) invites a major reconsideration of the roles and relationships between library resources and technical services:
1. Bibliographies should be seen, not so much as library resources, but as a dramatic enrichment of the access function far greater than can be provided by catalogs. Not only does the access provided by bibliographies greatly exceed that of catalogs in detailed indexing, but, also, the sheer quantity of records is far greater. Nontrivial intellectual access to the published record depends on access to bibliographies. Conventional catalog records, limited as they are to editions of monographs and titles of serials for locally-owned material only, are simply not in the same league in terms of providing bibliographical access.

2. Libraries’ operating records (acquisitions, circulation, serials receipts, etc.) should be automated whenever feasible and made accessible to users. In multilibrary systems the possibility of mutual advantage in access to records places an additional premium on the automation of library records provided that compatibility and linkages make them accessible from remote sites.

3. To the extent that texts are available in electronic form, the whole view of library collections changes: location and ownership of copies of texts becomes a technical detail for librarians irrelevant to the reader. What counts is what is conveniently accessible. Given modern telecommunications, any attempt to restrict users’ attention to locally stored databases would be a travesty of librarianship’s service traditions.

4. The bibliographical records in bibliographies will need to be linked to libraries’ holdings records. This implies changes in distribution of databases. Neither traditional marketing through centralized retailers (e.g. DIALOG) nor newer, isolated, “stand-alone” systems (e.g. Infotrac) can deliver what is needed. Either could do so if they ceased to be marketed only as separate “closed” systems and were, instead, regarded as open systems and provided with standardized interfaces to library records. A bibliographical search would continue to be a two stage process, as it is with manual searching: The first stage identifies what exists; the second locates a copy. The difference is that computer-based procedures should be able not only to handle each stage but also the transition between them. A natural and logical extension of the “Linked Systems Protocol” is to have a standard interface whereby a set of records retrieved from a bibliography could be searched against a set of library records.

5. Given 1–4, the library catalog as we currently know it becomes unnecessary. Given an ability to link records in a bibliography to holdings records, there is no longer any role for the catalog to play. This is entirely to be expected if one accepts (a) that it was the limitations of nineteenth and early twentieth century library technology that prevented effective combination of bibliography with library records; (b) that the modern library catalog achieved a solution by creating, in effect, an alternative local bibliographical superstructure, a subset of bibliographical records also present in bibliographies, built up on library records; and (c) that the limitations of paper technology is no longer relevant as newer, more flexible computer technology replaces it.
We can expect the bibliographical apparatus of the catalog to merge back into the mainstream of bibliography. Viewed another way, we can expect a redefinition of the catalog as the umbrella for the totality of bibliographical records linked to holdings records that a given library makes available. In retrospect this definition is not really incompatible with past catalog practice. In recent years almost all of each library's catalog records have been derived from large bibliographical files at OCLC, LC card sets, or elsewhere. Even "original" cataloging is, in practice, ordinarily derived from (or verified against) extant bibliographical records whenever possible.

The consequences and benefits of providing library users with extensive, convenient online access to a wide range of bibliographies and with interconnected access to bibliography, catalogs, and library holdings themselves provides an exciting prospect. As Shera and Egan wrote on 1950:

"... The production of bibliographies has been completely separated from all those processes which make the materials physically available. This trend cannot be continued if our efforts to bring recorded materials under the control of those who need them are to meet with success. ... No solution can be regarded as satisfactory unless the resultant system of bibliographic organization directs the inquirer to the material he needs, indicates its location, and provides the means for placing it before him." 28

REFERENCES AND NOTES

5. In terms of the MARC format for the communication of bibliographical records, the fixed fields and those with tags numbered through 899 describe either an edition of a work or the record describing that edition. The data apply, in principle, to all copies of that edition, although "local" additions to the record can be made (e.g., 590). Fields 900 and above refer only to individual copies or to individual libraries' records associated with those copies.
9. Ibid., p.564. According to the AACR2 glossary, a catalog is a "list of materials contained in a collection, a library, or a group of libraries, arranged according to some definite plan."


12. Swank, "Subject Cataloging."


14. The Division of Library Automation, Office of the President, University of California, is mounting part of the Medline database in conjunction with the university's online union catalog (MEVLYL) with support from the National Library Of Medicine (grant #G08LM04466-01,-02). An experimental linking of the Medline bibliographical records with the library catalog holdings records is expected as part of this project. C. A. Lynch & E. B. Brownrigg, "Public Access Bibliographic Databases in a Multicampus University Environment," paper presented at the International Conference on Data Bases in the Humanities and Social Science, Montgomery, Alabama, July 11-13, 1987.


17. In the terminology of hypertext cross-references (links) are made between passages of text (nodes) that can, in principle, be text, graphics, animation, or digitized sound. Two or more documents with links between them constitute a hypertext document. A hypergraph is a mapping of links. For a convenient recent introduction to hypertext and its complexity see N. M. Delisle & M. D. Schwartz, "Contexts—A Partitioning Concept for Hypertext," *ACM Transactions on Office Information Systems* 5:168-86 (1987).


21. The substantial duplication within and between bibliographic files makes it difficult to estimate the total number of unique items. (See M. K. Buckland and others, "Methodological Problems in Assessing the Overlap between Bibliographical Files and Library Holdings," *Information Processing and Management* 11:89-105 (1975)). In 1981 it was estimated that, allowing for duplication, abstracting, and indexing services had forty million unique items and were adding six million unique items annually. (J. L. Hall and M. J. Brown, *Online Bibliographic Databases*. 2d ed. (London: Aslib, 1981), p.xv). The Library of Congress creates some 200,000-300,000 LC MARC records a year. Even allowing for records created by other libraries here and abroad, the total of unique catalog records must be far less than the number of entries made for bibliographies. Duplicative indexing and abstracting records for the same item are more likely to enrich access through additional indexing terms than are duplicative catalog records supposedly following the same standards.

22. A few database publishers (notably the Information Access Corporation, National Library of Medicine, and Institute for Scientific Information) have expressed interest in licensing their databases for local library use (as opposed to the sale of database products to libraries). Aside from the "MEDLINE on MELVYL" project at the University of California and the mounting of the *Magazine Index* at Georgia Institute of Technology, there are very few reported examples as of August 1987. (See B. Quint, Journal Article Coverage in Online Library Catalogs: The Next Stage for Online Databases?" *Online* 11, no.1 (Jan. 1987): 87-90.

23. ANSI Draft American National Standard Z39.50—198x—Information Retrieval Ser-

24. There are three separable elements: a protocol for transferring back the retrieved set of references from a bibliographic file; searching that set against a file of library holdings records; and data deficiencies in either file that would impede matching (e.g., lack of ISSNs for serials).

25. Swank, "Subject Cataloging."

Using Performance Measures to Implement an Online Catalog

Deborah K. Barreau

Efforts to evaluate online public access catalogs should include a measure of how the catalogs affect the ability of libraries to make materials available and accessible to patrons. This study describes how availability analysis technique is used in implementing and evaluating an online catalog in the library of a small university. The performance measures are computed here to assist in setting realistic goals and in correcting catalog problems and to aid management in viewing the innovation in a broader context of library functions that contribute to, or hinder, patron success.

It is difficult to measure the impact of automation on a library in terms of performance. Few argue that automating library processes results in reducing expenses, but many accept the notion that what is gained in terms of flexible and efficient service justifies increased costs. Studies show that patrons respond well to automation and that they prefer using online systems to traditional card catalogs in libraries where they are available. Patrons anticipate improvements in quality and speed of service as a result of automation.

One aspect of automation, the online public access catalog (OPAC), is relatively new in libraries, and it often is difficult to use. Studies of OPACs focus on the features that simplify their use, including user preference for screen displays, online help facilities, and command syntax. Other studies focus on the ways users approach a search, providing additional data for designing a user interface. While these studies yield important information for designing and implementing an OPAC, each library needs to be aware of the effects of the OPAC on local patrons. Libraries follow different policies and practices, and any innovation must respond to the needs of locally served patrons if it is to succeed. The potential of the online catalog as a tool for rapid, convenient, and comprehensive research is unquestionable, yet there is little evidence linking patron success in finding items sought to the use of the online catalog. Some evidence suggests that the OPAC may even have a negative effect upon user success initially when retrospective conversion is incomplete.

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It is the responsibility of library management to evaluate the impact of new programs and innovations on the patrons. The purpose of this study was to evaluate the online catalog using an availability analysis strategy. This strategy, which measures the likelihood of patrons finding items sought, was used to examine success rates of catalog users in one library where an OPAC was being introduced. Causes of failure at the catalog were identified to provide information for developing a program for implementation of the automated system.

BACKGROUND

AVAILABILITY ANALYSIS

The availability analysis technique chosen for the study was first described by Paul Kantor and was applied to studies described by Kantor and T. Saracevic and others at Case Western Reserve University. Kantor refined the analysis and described it with other techniques in Objective Performance Measures for Academic and Research Libraries. The technique is comprehensive, measuring library functions such as acquisitions, cataloging, and circulation policies; and it yields an unbiased, empirical measure that can be compared to studies at other libraries or subsequent studies at the same library. Data gathered before and after the implementation of a new circulation policy at Case Western are one example of how the technique was used to evaluate new programs.

Availability analysis is suitable to any type of library and is useful for assessing the library’s performance. The technique has been used in public, professional, and academic libraries.

METHODOLOGY

This analysis, used by researchers at Manderino Library, was performed on a sample of 300–400 “known item” searches at the library catalog. The sample size was chosen because of a low statistical error and because larger samples approach diminishing returns on the amount of time and effort required to collect data.

The researcher would approach the patron at the catalog and explain that a study of availability was in progress. If the patron was willing to participate and indicated that he or she was looking for known items, a form (see figure 1) to record information (author, title, call number) about the items sought was given. The patron was asked to put a check in the “Found” column beside each item located in the library (see figure 2) and to deposit the completed form in a box near the exit when leaving the library.

The researcher retrieved the form soon after deposit and looked for the items that were not found in order to determine the cause of the failure (i.e., patron dissatisfaction), checking the appropriate column. The causes of dissatisfaction were coded as follows:

DACQ: The library did not own the item at the time of the request.
DCAT: The user failed to identify the item correctly in the catalog. There are two categories of failure at the catalog: user catalog errors and library catalog errors. Previous studies used this category primarily to identify user errors, such as an incorrectly copied call number. There are also library
### Figure 1. Patron Search Form

<table>
<thead>
<tr>
<th>PATRON SEARCH FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author, title, call number of items sought</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Status (please check one): faculty | graduate student | undergraduate | other
Type of catalog used: card catalog only | online catalog only | both
Please check if you use the library frequently (weekly or more): yes | no

THANK YOU FOR YOUR ASSISTANCE.

### Figure 2. Completed Patron Search Form

<table>
<thead>
<tr>
<th>PATRON SEARCH FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author, title, call number of items sought</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Matthews Public Access to Online Catalog 025.3629 M37 995

A Perfect Spy  John Le Carre

Status (please check one): faculty | graduate student | undergraduate | other
Type of catalog used: card catalog only | online catalog only | both
Please check if you use the library frequently (weekly or more): yes | no

THANK YOU FOR YOUR ASSISTANCE.
catalog errors, such as when the bibliographic record lists an incorrect call number for an item. This study identified both kinds of errors.

**DCIR:** The book was being used, checked out to a patron.

**DLIB:** The book was not located because it was missing, misshelved, or in process.

**DUSR:** The book was properly shelved, but the user failed to locate it.

**Other:** Multiple copies of the title were not found for different reasons. (These were recorded and counted as fractions of a title and computed in the performance measures described below.)

The number of failures in each category was summed and a performance measure computed for each category. Finally, an overall library performance measure (a product of the measures) was computed. This measure, the ratio of items found to items sought, represents the likelihood that a patron will find a desired item.

**MANDERINO LIBRARY**

The online catalog at Louis L. Manderino Library, California University of Pennsylvania, was developed from **TEXTRIEVE** (a trademark of Dan Strick). The library obtained a site license for the software and installed the system with terminals for public access in fall 1986. **TEXTRIEVE** was used successfully in businesses and libraries, but this was its first use as an OPAC. **TEXTRIEVE** was chosen for Manderino Library because it was low in cost, compatible with existing hardware, and offered enhancements such as keyword searching and rapid retrieval. It became apparent that changes in the user interface and documentation would be necessary to assist patrons and that it would be necessary to examine the integrity of the database itself to identify possible deficiencies. Formal introduction of the OPAC was postponed until fall 1987, allowing time to examine the system and develop adequate documentation and training programs, but experimental "quick reference" documents were placed at the terminals for patrons who wanted to test the system.

The delay provided an opportunity to obtain a measure of patron success at the catalog before implementation, when most people still used the card catalog. The availability analysis technique was chosen, and a few questions were added to the form to allow comparison of the success rates of card catalog users to those who were using the OPAC. Other questions on the form provided information that was useful in planning appropriate documentation and instruction.

During the three weeks from March 16 through April 3, 1987, 496 patron contacts were made, 232 of whom were looking for specific items and were given the forms for recording items sought. The return rate was 63 percent (146 out of 232). These forms included the 364 known-item searches used to compute the performance measures.

**RESULTS**

The data were fed into a microcomputer for analysis, using PAVL, a set of programs written in Turbo Pascal. The programs allow for data input,
analysis, and computation of performance measures and the associated statistical error for each measure.

Each form was assigned a number before the study began. When the forms were returned, each item on the form was numbered so that every item in the sample had a unique identifier.

The results of the study are displayed in figure 3 (as produced by the PAVL program). Each measure is computed and displayed with the standard error of the proportion.

ACQUISITIONS (PACQ)

PACQ is the percentage of the items sought that are owned by the library. There were 364 known items searched, and 328 (91 percent) of these items were owned by the library (This percentage is consistent with the findings of earlier studies indicating that libraries generally acquire about 90 percent of the materials requested locally.) Six more items were purchased by the library but were in process and not accessible to patrons.

Records were added to the card catalog more quickly than to the online catalog (which was two months behind at the time of the study), and this could have had a negative impact as OPAC use increased.

CATALOGING (PCAT)

PCAT is the percentage of the items sought and owned by the library correctly identified (call number and shelf location) by the patron at the catalog. Of the 328 owned items sought, 314 (96 percent) were accurately identified at the catalog. This measure was lower (92 percent) for OPAC users than for card catalog users (95 percent), but the difference was not statistically significant. The performance rate at the catalog was high, indicating no serious problem in finding items, yet potential problem areas were identified for the online system.

Eight items were not located because they were housed in reference, reserve, or curriculum collections, but this was not clearly indicated on the card or (more often) OPAC display.

One item was not found in the OPAC because it was a play in a collection that was visible in a contents note field but not searchable and not part of the default display for the online record.

Incomplete holdings pose problems, though retrospective conversion of monographs is nearly complete at Manderino Library and did not affect results as they have in libraries where only a fraction of the database is online.

Four call numbers were incorrectly recorded by patrons, a relatively low incidence of error that may be attributed in part to the practice of using Dewey numbers that rarely extend beyond four places to the right of the decimal. In two cases, the numbers copied were completely wrong, and in two cases the Cutter numbers were recorded incorrectly.

One item was not found in the online catalog by the patron, though the record was there. The record may have been missed because of punctuation in the author's name (O’Neill). Problems with searching terms containing punctuation (such as hyphens, apostrophes, and diacritics) are being studied and corrected.
### RESULTS OF AVAILABILITY ANALYSIS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of items sought</td>
<td>364</td>
</tr>
<tr>
<td>Number of items found</td>
<td>236</td>
</tr>
</tbody>
</table>

#### MEASURES OF DISSATISFACTION:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items not acquired by the library (DACQ)</td>
<td>34.40%</td>
</tr>
<tr>
<td>Items not found in the catalog (DCAT)</td>
<td>14.40%</td>
</tr>
<tr>
<td>Items out in circulation (DCIR)</td>
<td>28.40%</td>
</tr>
<tr>
<td>Items not shelved properly by patrons (DLIB)</td>
<td>29.40%</td>
</tr>
<tr>
<td>Items available, but not found</td>
<td>21.40%</td>
</tr>
</tbody>
</table>

#### MEASURES OF PERFORMANCE:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of items owned (PACQ)</td>
<td>0.91 +/- 0.02</td>
</tr>
<tr>
<td>Percentage of catalog records (PCAT)</td>
<td>0.96 +/- 0.01</td>
</tr>
<tr>
<td>Percentage of items on shelf (PCIRC)</td>
<td>0.91 +/- 0.02</td>
</tr>
<tr>
<td>Percentage of items properly shelved (PLIB)</td>
<td>0.90 +/- 0.02</td>
</tr>
<tr>
<td>Percentage of items found (PUSR)</td>
<td>0.92 +/- 0.02</td>
</tr>
</tbody>
</table>

#### TOTAL AVAILABILITY PERFORMANCE

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEASURE (probability of finding a known item)</td>
<td>0.65 +/- 0.03</td>
</tr>
</tbody>
</table>

* This measure of user dissatisfaction was multiplied by a correction factor to account for items that could not be identified.

Figure 3. Availability Analysis Results

#### CIRCULATION (PCIR)

PCIR is the percentage of items owned and correctly identified by call number that are not being used at the time the request is made. Of the 314 items owned by the library and properly identified at the catalog, 28 were being used at the time the items were sought, and 286 (91 percent) were available for checkout. Several factors contribute to availability. The library has a three-week loan policy that allows renewals, and patrons may request a “hold” on items that are out. Popular items may have long hold lists, and this sometimes interferes with their availability—particularly when the item waits to be picked up from the hold shelf for as long as a week.

Another availability factor relates to faculty use. Three of the circulating items were checked out to faculty and had been out for more than sixty days. The probability that an item will be available when requested is high, so this does not appear to be a serious cause of frustration; however, items checked out to faculty may be out of circulation for the semester unless a
"recall" is issued, and most patrons seem to be reluctant to exercise this privilege. It is uncertain that the circulation measure will prove useful in evaluating OPACs. Poor success at the catalog can result in fewer checkouts, making more items available for circulation, but the effect may be insignificant. Frohmberg and Moffet found a higher overall availability rate after introduction of an automated circulation system, though the individual measure most improved was the library's check-in and reshelving processes. Though the automated circulation system was more efficient, patrons did not increase the quantity of checkouts as a result. It is not expected that patrons will increase their borrowing habits as a result of the OPAC—the circulation measure should not fall. (If circulation should decline, the introduction of the OPAC will be a factor worth investigation. However, studies by Buckland and Shaw have been able to predict the circulation interference measure based upon other variables.)

LIBRARY PROCESSES (PLIB)

PLIB is the percentage of items that are in their proper shelf locations at the time of the request. Often library processes interfere with patron access to items. At Manderino Library, this was the lowest performance measure. Of the 286 items that were not circulating at the time of the request, 257 (90 percent) were in proper shelf locations. Of the 29 items that were not where they belonged, 11 were missing but not yet identified as lost. One item had been identified as lost, but the record had not yet been removed from the catalog (no records were deleted from the OPAC); 1 was on a cart waiting to be shelved; 2 were in processing (mending, being placed on reserve, etc.); 1 was shelved in an unlabeled range and out of call number sequence; and the remaining 13 were out of place at the time of the search for reasons that could not be determined and reappeared by the time the study was completed.

This measure saw the greatest improvement in Frohmberg and Moffet's study, though they attribute part of the success to the "Hawthorne effect" on the staff. Though the automated catalog is not directly related to these library processes, it may impact library functions positively for similar reasons or negatively through associated projects, such as barcoding and conversion, that disrupt normal processes.

USERS (PUSR)

PUSR is the portion of the items sought, available, and properly shelved at the time of the search and successfully located by users. Patrons found 236 (92 percent) of the 257 items that were in their proper shelf locations at the time they were sought. It is difficult to determine why patrons have trouble, though the lack of understanding of how call numbers are ordered, the lack of familiarity with the library's layout, carelessness, shelf height, and poor labeling are all likely factors. Placement of call numbers on at least two of the books may have hindered the patron's search. One book had a narrow spine, so the call number was on the front; another book's label was placed over a volume number.
This measure is not likely to be changed significantly by the introduction of the OPAC, though failure and success at the catalog contribute to patron attitudes about the library and can influence their behavior.

**TOTAL PERFORMANCE (PAVL)**

PAVL is the total availability performance measure, and it reflects the probability of finding a known item in the library. It is the ratio of the number of items found to the number of items sought and is a product of the other measures.

Patrons at Manderino Library have a 65 percent probability of a satisfactory search for known items. This measure is good when compared to many libraries that report a rate in the range of 50–60 percent. It may be reasonable to expect a small academic library with a relatively homogeneous patron population to have a higher performance rate than a research library where the collection is larger and the clientele are more diverse, but the study should be performed at comparable libraries before conclusions are drawn.

The analysis shows the library performing at better than 90 percent in each function measured, but there is room for improvement, as a patron is likely to be successful in finding only thirteen of twenty items sought. A lower performance rate is undesirable; therefore, a minimum goal for the library is to ensure that innovations do not produce a drop in the overall performance rate of 65 percent.

**RELIABILITY OF RESULTS**

Policies for collection development, acquisitions, circulation, and cataloging appear to be effective in relation to user needs at Manderino Library. Acceptable sample size resulted in a low percentage of error, and the relative unobtrusiveness of the administration of the forms contributed to reliability of the results. There was some concern over the large number of forms (86) not returned, but the 146 (62 percent) received is better than the 40–50 percent return rate reported by some studies.

Problems with circulation system light wands discovered during the last week of the study made it possible that some of the items missing when the study began and located later may actually have been checked out at the time they were sought. It is also likely that some of the items recorded as “circulating” may have been missing for other reasons. However decisions were made, the product of the two measures affected (PCIR, PLIB) was the same, and neither the overall performance rate nor the PCAT measure was changed.

There are questions and problems the study did not address that are important considerations for a library introducing an automated catalog. What portion of the collection is never used and does an automated catalog with keyword subject access affect this use pattern? How successful were the patrons who were looking for items on a subject? How effective are our reference services in dealing with patron problems at the catalog? How often do users bypass the catalog and go directly to the shelves to find what they want? Some means of measuring these and other factors are important
to an accurate evaluation of library performance and of the OPAC's influence on that performance.

CONCLUSIONS

An automated catalog is flexible, allowing for change as the library collection grows and services expand, and implementation of the system is an ongoing process. It is important to recognize that the data supplied by an availability analysis represents the library's performance at a given time. Changes in collection policy, the creation of new courses at the university, and the automation of the catalog are examples of developments that can affect availability. It is important to collect data periodically to monitor the impact of new programs and be alerted to problems that might otherwise go undetected. This discussion involves the "first stage" of implementation of the OPAC at Manderino Library.

The implementation program includes evaluation and modification of the system itself, presentation of user orientation and instruction sessions, and development of online help facilities and user documentation. Data gathered in the study helped identify problem areas in the catalog that are obstacles to success, making it possible to eliminate them or minimize their effects.

The performance study found four problems as most likely to interfere with patron success with the OPAC: (1) incomplete location information on the bibliographic record, (2) incomplete holdings information in the database, (3) special characters and punctuation in the index fields that were interpreted differently by the search program, and (4) inadequate access points and display of fields in the default format.

Records of eight of the fourteen items users failed to identify at the catalog contained incomplete or inaccurate location information, occurring more often in the OPAC than in the card catalog. In the card catalog, plastic covers marked in red designate items in the reserve collection, and most items in the reference, curriculum, or Pennsylvania collections are designated with an appropriate prefix ("R", "Tx", "Pa") in the call number.

Much of the retrospective conversion of the database was performed by an outside agency, and records were entered into the database that did not always conform to local practice. Changes in practice over the years contributed to the problem, and many records had no prefixes or incorrect prefixes for special collections. In many cases, the local holdings field designated the location simply as "STACKS." This will be an obstacle to patron success until the incorrect records are revised and until a method is discovered for "red flagging" the online records of items temporarily placed in the reserve collection.

Several changes were made at Manderino Library to address location inaccuracies. The library's OCLC profile was revised to indicate the appropriate collections as holding libraries and corresponding location information entered in the local holdings fields of the MARC record. Information about the location and content of the special collections was included in the user manual. The manual has instructions for patrons to determine if an item sought is in a special collection and suggests they check these areas if they are unsuccessful in finding them in the regular collection.

A schedule for regular system updates was planned to guarantee that the
database accurately reflects the library’s current holdings. A public information mechanism (newsletter, online notices) for keeping patrons apprised of scheduled “down time” for system modifications was also planned.

The TEXTRIEVE program is designed to handle special characters such as apostrophes and hyphens as word “separators,” and diacritical marks are represented by a sequence of characters. This poses problems in searches for terms that include these characters (for example, “audio-visual” is not retrievable but “audiovisual” and “audio and visual” are). The vendor agreed to make the necessary revisions in the program to provide solutions to these problems.

Plays or short novels in collections cannot be accessed directly in the OPAC, and searching by second author or series title is possible only as an added entry. There were two instances of patrons who were unable to locate items the library owned because the items sought were part of an anthology or volume of collected works. A search in the card catalog by author made it possible to locate the titles in a contents note (not available for all collections). The OPAC also displays a contents note but not in the brief, default format.

Decisions about which fields should be indexed and displayed are very important and must be made before the database and indexes are loaded, though revisions can be made. Ideally, the online catalog can be searched by any field, but restrictions on storage space and screen size and the requirements of rapid retrieval and facility of use are factors that often render the ideal implausible. Fields such as the series title can be added to the indexes, but the debate about analyzing contents cannot be resolved immediately. Users must be carefully instructed about the fields available in the different formats and encouraged to check contents notes when they are available. The feasibility of searching titles and authors in a contents note was being studied.

The online catalog is an important innovation for libraries. The advantages are undeniable, yet large investments in hardware, software, and personnel are often poured into the automation process without a clear idea of how the system affects the users. Frohmberg and Moffet found a typical cycle of user reaction at a university library to be initial frustration followed by a positive attitude toward the change as the benefits of the system are experienced and, finally, a return to normal attitudes as new users, who are unaware of the change, enter the university. The measure of the quality of service the users experience as a result of the innovation is the true indicator of successful implementation.

Though it is doubtful that the introduction of the online catalog will improve the 96 percent success rate of catalog users at Manderino Library, the system is related to other library functions, and the innovation can make a difference in overall availability. One statistic that will be important in analyzing the system’s impact is how well patrons make the switch from card to automated catalog. Only 20 percent of the searches in this study were performed at the online catalog, a proportion expected to double or triple in the ensuing year. The study will be repeated in spring 1988 to reevaluate the program.

A successful online catalog is one that accurately represents the library’s
collection and allows patrons to find what they are looking for with minimal difficulty. When they cannot, the first responsibility of the library is to eliminate the obstacles, and this is easier to accomplish in the early stages of the project. When that is not possible, then user aids and instruction programs can help patrons to overcome the obstacles. Though the system in operation at Manderino Library is unique, the problems are not. Measuring the success of patrons and identifying the causes of their failure are beneficial to individual libraries where innovation is underway.

REFERENCES

8. Saracevic and others, p.15.
17. Frohberg and Moffet, p.96–98.
The Reproduction of Library Materials in 1987: A RLMS Perspective

Suzanne Cates Dodson

Establishing the boundaries for a survey of literature relevant to the work of the Reproduction of Library Materials Section is no easy task. The common interests between RLMS and the Preservation of Library Materials Section in particular become especially evident as one searches, and deciding what is appropriate for the year’s work in RLMS’ areas of concern is often a puzzle. Choices, therefore, are based on personal perceptions of what the members of RLMS might find especially interesting. If my selections appear more than once, it is better than not at all. If anyone’s favorite piece is missing I apologize and welcome a note about it so that it can be included in next year’s survey.

A number of topics relating to the reproduction of library materials are considered, including microforms in libraries, bibliographic control, equipment, micro-publishing, preservation microfilming, the technical production of microforms, standards, photocopying, facsimile, copyright, and new technologies like digital image processing.

For the most part this survey is confined to materials published in 1987, together with a few items from 1986. It is unfortunate that 1986 lacks its own account of the year’s work, but thanks to bibliographies prepared by Sinkule for micrographics (151), Fischer for optical and videodisc technology (66), and Swora for optical digital scanning and storage technology (155), the hiatus is less of a problem than it might have been. And for 1987 my special thanks are due to Lois Carrier, University of British Columbia Library; Jack Pontius, Pennsylvania State University Library, and Tamara Swora, Library of Congress for all their help in tracking down possibilities for inclusion.

RLMS/PLMS

The concerns of RLMS and PLMS overlap, to the point where a possible merger of the two sections was suggested and discussed (61). So far the members of RLMS believe that our interests can still be best served by having our own, specialized section.

Microforms in Libraries

Micrographics and the place of microforms in libraries have traditionally been major interests of RLMS. The section’s program at the San Francisco Conference tackled the question of whether sparkling new technologies will supplant the reli-

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able (but by comparison, stodgy) microform (106, 104). Microforms: Dead or Alive? featured Scott Bullard (Kent State) as the devil’s advocate, and Phelix Hanieble (University Microfilms International), Ann Swartzell (New York State Library), Shirley Leung (University of California-Irvine), and Glenda Pearson (University of Washington) as the medium’s staunch supporters who convinced the large audience that microforms were indeed very much alive and demonstrably kicking. Various studies designed to probe the future of microform as an information storage medium were released in 1987. One, commissioned by the Association for Information and Image Management (AIIM) and conducted by Coopers and Lybrand, predicted a declining role for microfilm and a boom for optical disk by 1996 (53, 15). John W. Frank, the director of the study, was quoted as saying that he “expects most I & IM systems to be three-phased with magnetic media used for immediate on-line availability, optical disk for intermediate storage and microforms for archival backup” (8, p.2). Settani, however, was sanguine about the prospects for microforms (149), and Yerburgh agreed: “Microforms show no signs of obsolescence or extinction” (179, p.20). Bourke considered both the past and the future of micrographics in libraries in relation to CD-ROM, CD-I, CD-VI, CD-PROM, WORM, and DRAW (25).

Back in the everyday world, McIntosh described visits to eleven libraries in Canada and the United States, where she surveyed their microform facilities (96). The University of Tulsa, Oklahoma, received a $1.5 million matching grant from UMI to expand microform holdings and to acquire new equipment (117), and the University of Missouri in Columbia was given a National Endowment for the Humanities (NEH) grant of $93,698 to promote the use of its microform collection (115). Baber and Zink described their project to encourage the use of U.S. Government Printing Office (USGPO) microforms by incorporating them into their government publications stacks (16). Caldwell-Wood and Prather-Forbis talked about the way in which Texas A&M University Library counts the microfiche collection (33), and the results of numerous counts like theirs appeared for the Association of College and Research Libraries (ACRL) (2) and the Association of Research Libraries (ARL) (12).

Draft guidelines for packing and shipping microforms were approved by the Executive Committee of RLMS in June 1987 and were published (with a request for comments) in RTSD Newsletter (62).

BIBLIOGRAPHIC CONTROL

One of the most welcome bits of news announced the signing of an agreement between ARL and The Computer Company (TCC) of Richmond, Virginia, to create machine-readable catalog records for “the monographic reports [1965-1983] in the National Register of Microform Masters. . . . When completed, the project will greatly facilitate the searching that is a necessary component of a national preservation effort to preserve the contents of brittle books. . . . As the project proceeds, LC’s Cataloging Distribution Service will compile tapes and sell them with no constraints on further reproduction or distribution to libraries, networks, and other organizations (125, p.6-7).

Elsewhere, the State University of New York at Buffalo received a Title II-C grant to create catalog records on the Research Libraries Information Network (RLIN) for General Microforms’ Latin American Documents series (116) and Stanford completed their Early American Imprints: Second Series project (120). The records have been keyed into RLIN and made available to the Online Computer Library Center (OCLC). Title II-C grants were also awarded for a project to catalog the Goldsmiths’-Kress Library of Economic Literature (46). OCLC published a brochure describing their Major Microforms Project (MMP) and the sets that have been (or are being) cataloged (98). Volume 2 of Niles’ index to collect-
tions in microform appeared (124), as did a guide to microform titles in LC’s Mi-
croform Reading Room (83). UMI produced a useful listing of the guides and in-
dexes to its research collections, including those to collections UMI has taken
over, e.g. from Microfilming Corporation of America and Bell & Howell (68).
G. K. Hall published Bibliographic Guide to Microform Publications 1986 (20),
which includes books and nonserial microforms cataloged during 1986 by the
New York Public Library (NYPL) and LC. Salmon and Phillips described
NYPL’s online public access to microform records (146)—CATNYP—an acro-
nym which must have given the kind of pleasure to its inventors that Nepeta ca-
taria does to most felines. An improvement to entries for microforms is the fact
that preservation information, including microform characteristics, can be re-
corded now in the USMARC format, using the 583 field (133). For additional
references on bibliographic control see 45, 47, 128.

EQUIPMENT

The big news here was no news. Many waited with growing impatience for the
often promised but never delivered Microcard/Microprint adaptor that would al-
low us to make prints from opaque microforms (101). At a meeting in San Antonio
this January one lucky person reported having received one, so we must assume
that it finally exists. Its appearance will come as a great relief to all with large
collections of opaque microforms.

An overview of other new equipment—readers, printers, and storage equipment
shown at the 1987 AIIM Equipment Exposition appeared in the Micrographics
Newsletter (7). Library Technology Reports reviewed five new reader/printers
and provided updates on five others (90), Saffady edited volume 11 of Micro-
graphics and Optical Storage Equipment Review (144) and Williams of Cimtech
in England provided his regular surveys of new technology: photocopiers, micro-
graphics equipment, optical disk, etc., and related matters, including copyright
(173, 174, 175). Reviews of three reader printers—the Bell & Howell ABR 1000
(29), the Minolta RP503 (63), and the 3M MFBl100 (30)—appeared in Informa-
tion Media and Technology. Broadhurst reviewed the Gemini II diazo fiche duplica-
tor, which uses a process free of ammonia (31). Micobra also has a duplicator
that dispenses with the usual aqueous ammonia (102). These machines could be
useful where fiche duplicating is done as a public service function and where am-
monia fumes can cause problems.

MICROPUBLISHING

Microform Review remains the major source for information about new micro-
publications and reviews of micropublications, and anyone interested in what has
been produced over the past year should not fail to scan the 1987 issues. Choice
has begun to review micropublications (121). Chadwyck-Healey published, on
microfiche, more than 16,000 pages from hundreds of micropublishers’ catalogs
(108). In specific areas, Ach described civil rights sources published by University
Publications of America (1), Bourke covered genealogical materials available
at NYPL (26). Campanelli talked about the distribution of Securities and Ex-
change Commission data in microform (35), Luebbe brought readers up-to-date
on Canadian government publications in microforms (93), Troy discussed Ameri-
can Indian materials (161), and Sinkule and Moody reviewed the availability of
Food and Agriculture Organization (FAO) documents on microfiche (152).
Bourke also produced an overview of new publishing projects for scholarly re-
search (25). In other news Research Publications acquired Harvester (49), and
Lost Cause (50), and the U.S. government talked about the privatization of the
Educational Resources Information Center (ERIC) (168), and the National Tech-
nical Information Service (NTIS) (64, 126, 127, 167). Additional references of
interest cover music (94), history (111), and maps (166).

**Preservation Microfilming**

Preservation, especially preservation microfilming, formed the subject of countless publications. James Billington, the thirteenth Librarian of Congress, talked of the vital need to preserve the records that constitute "the legacy of the past in our time, not just a marginal luxury item for the casually curious, but an unrenewable natural resource indispensable to all of us" (21, p.1). The urgency of the situation was vividly presented in *Slow Fires: On the Preservation of the Human Record* (153), a film narrated by Robert MacNeil and aired on the PBS network in December. Troyer reviewed the film, commenting that the "issue of microfilming is debated at length. Child, assistant director of the Smithsonian Institution Libraries, points to its strengths as a low-cost, proven technology for preserving the 'information content of books'" (160, p.73-74). Weinberg, writing about the National Archives declared that "The self-destruction of paper can only be countered by massive microfilming projects" (171, p.17). And Winterble, reporting on the meeting of the Commission on Preservation and Access, said that "Microfilming was reaffirmed as the "best technology now available' to capture the contents of vast numbers of brittle books" (176, p.6). The Council on Library Resources (CLR) received a grant of $300,000 from the William and Flora Hewlett Foundation to support the commission (176, p.6).

The Research Libraries Group's preservation activities were discussed in "Preservation: The Battle to Save the Nation's Libraries" (136). Weber covered the ARL and ALA statement to the Subcommittee on Post-Secondary Education, Committee on Education and Labor, U.S. House of Representatives, March 3, 1987 (170). During these hearings witnesses testified that microfilm is the preferred preservation medium for brittle books (163). (Unfortunately, Barbara Tuchman, one of the people interviewed in *Slow Fires*, was less than enthusiastic about microfilm.) Elsewhere Calmes evaluated various media presently available (34). Child believes that the personnel, experience, and facilities exist now to support a national preservation microfilming program (41).

Although information on developing and implementing preservation program increases steadily, a survey of sixty-three ARL libraries discovered that many lack well-established programs. Furthermore, the directors often seemed unaware of existing help (11). Gwinn produced an excellent work on the subject (70). Montori compiled a lengthy bibliography on preservation, with references to microfilming, film types, and processes (110). A new ARL SPEC Kit has just been released (132), and a new edition of Columbia University Library's *The Preservation of Library Materials: A CUL Handbook*, has been published (134). The *RLG Preservation Manual* (142) gives especially good coverage to microfilming, with accurate and up-to-date information. Gertz prepared a cost study of the University of Michigan's brittle book microfilming program (67), while Byrnes and Elkington described the measures taken at Michigan to contain costs (32).

Specific projects were covered by Clack, who described the U.S. Newspaper Program (43); Bagnall, who wrote about the American Philological Association's project to preserve important materials in classical studies published from 1850 to 1918 (17); Bell, who discussed the preservation of local history in Kentucky (19); Holley, who covered Utah's newspaper project (77); Kaebnick, who described the work of the Hill Monastic Manuscript Library (81); Markham, who talked about the American Theological Library Association Preservation Board's nationwide cooperative preservation microfilming project (103), Terrill-Breuer, who explained how University Publications of America selects archival American history materials for filming (156); Wolff, who reported on the International Federation of Library Associations and Institutions' (IFLA) role in promoting the mi-
crofilming of newspapers around the globe (177); and Cunningham, who considered the preservation of newspaper clippings (56).

Both the University of Chicago (165) and the Northeast Document Conservation Center (122) announced increased capacities for preservation microfilming and the ability to handle work for libraries needing this service. The Mid-Atlantic States Cooperative Preservation Service received a grant of $584,000 from Exxon (48).

The monetary help provided for preservation microfilming reported in 1987 was impressive. Many institutions received NEH grants to microfilm newspapers as part of the U.S. Newspaper Program—an estimated $6.4 million by early 1987 (123). In addition, a large number received grants for a variety of projects. Good sources for information about grants received are C&RL News (119) and National Preservation News (113, 114).

TECHNICAL PRODUCTION OF MICROFORMS

1986 marked the sixtieth anniversary of the invention of the first commercially successful microfilming camera (172). In keeping with increasing awareness of the fragility of printed materials is also a growing concern for the long-term preservation of the microfilm. The Image Permanence Institute, established in 1985 (5), recently received $98,798 from NEH to fund a project evaluating the use of selenium treatment in prolonging the storage life of silver gelatin microfilm (113, p. 8) and $41,830 from the National Historical Publications and Records Commission for a study of degradation of cellulose acetate safety photographic films in use since the 1930s (118). Elsewhere, Thomas discussed the use of the methylene blue test for archival film quality (157) and Leary described work at the National Archives in Washington, including the use of potassium iodide in the fixing bath during film processing to provide protection against the development of redox blemishes and experiments with selenium sulfate toning “as a means of providing even greater protection against image deterioration” (88, p. 290). Ker explained how gold toning of the film of the Domesday Book is expected to increase its resistance to attack from external agents by ten times (84). AIIM produced a useful compilation of articles published between 1963 and 1987 on the maladies with which silver gelatin film may be afflicted (109). Among them is one on the image stability of silver materials (60).

Cibachrome could be the most stable color film available today (42, 162). Gunn outlined the relative merits of cellulose acetate versus polyester base for silver halide film (69), Thomas discussed splices (158), the Mid-Atlantic Preservation Service considered the choice of silver, diazo, or vesicular films for service copies (100), and Xidex explained the reasons for microfiche curl (105). Additional items of interest can be found in these references: 71, 76, 107.

STANDARDS

Standards play an important part in the production and storage of microforms of all kinds, as Schowen points out (147). But recognizing the need for standards does not always mean that they are followed, as James found in her study of filming practices of U.S. state and local government agencies (80). Lowell also addressed the question of local records and what is being done in Preservation Needs in State Archives (91).

A fair number of new and revised standards were published in 1987. Shaffer prepared a report for RLMS in which he described the work of American National Standards Institute (ANSI) and International Organization for Standardization (ISO) (150). Shaffer noted particularly that at last ANSI/AIIM MS111 appeared: Recommended Practice for Microfilming Printed Newspapers on 35mm Microfilm (139). He also pointed out that ANSI IT9.1-1987, American National Standard
for Photography (Film), Silver Gelatin Type—Specifications for Stability (9), incorporates three older standards, i.e., PH1.28-1984, PH1.41-1984, and PH1.66-1985. Anyone interested in American standards for microfilming will find them listed in a free catalog of publications for sale by AIIM (6). Shaffer also described the current work of ISO/TC 171 (ISO Technical Committee 171—Micrographics) and WG 3 (Working Group 3—Applications in Libraries), which has four documents in process: microfilming of newspapers; color film; graphic symbols used in microfilming; and microfilming documents on 16mm and 35mm film. Courtot (54), AIIM director, Standards and Technology and Kruger (85) also commented on the work of ISO/TC 171/WG 3. The scope of TC 171 was broadened to include “Standardization of documents and images on microforms and other optical media” (79, p.1). Lack of standards for optical disks was a problem, delaying the implementation of systems (148).

Looking to the future, Adelstein discussed the “Status of Permanence Standards (4).” He also described the move to raise the maximum permissible thiosulfate concentration limit for archival film. A small amount of residual hypo is now believed to be beneficial in increasing a film’s resistance to redox blemishes (3).

**PHOTOCOPIERS AND PHOTOCOPYING**

Color copiers are big news. As Crix said, “It’s all happening in the color copier market!” (55, p.221). This review begins with an explanation of different color copying processes, describes the main features of copiers currently available, and concludes with some notes on copiers expected soon. Also of considerable interest for preservation photocopying is “Bookmark,” a device developed jointly by the British Library’s Humanities and Social Sciences Reprographic Centre and Select Information Systems, called “the ultimate in equipment for copying from very fragile or tightly bound books” (51, p.5).

Subt discussed quality control of photocopies for archival purposes (154), the results of a study done by the USGPO for the National Archives and Records Service, and McColgin considered archival paper for photocopies (95). Of special interest are the papers from the December 9, 1986, conference of the U.S. National Archives and Records Administration, “Preservation Photocopying in Libraries and Archives” (135). Additional references on this topic include 89, 159, and 169.

**TELEFACSIMILE**

Henshaw chronicled the use of telefacsimile in libraries over the last 40 years (73), while Boss and Espo talked about the recent history and major issues in its use—need, copy quality, and cost (24). Cawkell produced a review and an update on the technology (38). Anand described a project involving the use of telefacsimile for interlibrary loan and document delivery at the National Library of Canada (10) and Ferguson reported on five projects using electronic information delivery systems (65). Sponsored by the Fred Meyer Charitable trust, five states—Alaska, Idaho, Montana, Oregon, and Washington—are involved. Hessler (75) and Lu (92) discussed the integration of microcomputers and telefacsimile machines.

**COPYRIGHT**

In the U.S., the Copyright Office of LC held hearings on the issue of library photocopying. “Under section 108 (i) of the 1976 Copyright Act, the Register of Copyrights is required to report to Congress at five-year intervals on the extent to which section 108 of the act—which permits certain reproduction of copyrighted works by libraries—is achieving a balance between ‘the rights of creators and the
needs of users'" (57, p.281). Librarians, publishers, and commercial photocopying expressed their concerns involving the "ongoing efforts to guarantee that appropriate copying for preservation, replacement, and especially for fair use purposes is permitted and that unauthorized copying is discouraged" (57, p.281).

In Canada the Canadian Library Association objected strongly to Bill C-60, an act to amend the Copyright Act (37), given its first reading in the House of Commons on May 27, 1987. Some believe that the amendments (which include the payment of royalties to authors whose work has been photocopied) will create a bureaucratic nightmare (129). Hopkins reviewed the copyright situation from a Canadian perspective (78) and the National Library of Canada produced a survey of copyright law around the world. It represents "a summary of reprography provisions in the current legislation of all those countries having international copyright relations, either as members of the Berne Union or as party to the Universal Copyright Convention, and in so far as national legislation exists in each of those countries. . . . Seventy-six countries have been surveyed" (36, p.[i]). Apropos of the Berne convention Oman, U.S. Register of Copyrights, spoke on the convention's history and why the U.S. has not joined (22).

Reed produced The Copyright Primer for Librarians and Educators (140) and a new journal on the subject—Rights: Copyright and Related Rights in the Service of Creativity—was launched (141). Nasri edited a work covering the legalities of copyright (112), Olsson considered the "Copyright Aspects of Reproduction" (130), and ARL produced a SPEC Kit that approaches the subject from the point of view of university administrations as well as libraries (164).

NEW TECHNOLOGIES

For those struggling with the newest in recording media, Becker's primer provided an excellent introduction to the terminology for the disc/disk-illiterate (18), and for people lacking background information but keen to learn, Rechel assembled an excellent reading list (138). In particular Rechel recommends CD-ROM, The New Papyrus (86), which he says is "at present, the L/OM [laser-optical memory] Bible" (138, p.41). Microsoft has also produced a video by the same title (40). Bogue presented an overview of information storage media, including film, computers, and optical media (23), Saffady reviewed the state of the art for optical storage (145)—his book includes a lengthy bibliography—while Yeazel talked about the trends (178) and McQueen and Boss updated the CLR report of 1985 in their book, Videodisc and Optical Disk Technologies. . . (97).

A number of people were cautious. Korda, in London, published a beginners' guide entitled CD-ROM: Passing Craze or New Papyrus? (39) while Arnold urged potential users to take a hard look at the facts before succumbing to the CD-ROM myths (13). Collier asked "Where is CD-ROM?" (44) and Davis wondered about the present and the future (59). Zeek presented "A Wish List for Digital Document Image Automation" (180) and Richard Bowers felt that "CD-ROM and other optical media are tools that will require time for learning appropriate uses and applications" (28, p.6). Quint sounded a cautionary note in the midst of all the hype: "How is CD-ROM Disappointing? Let Me Count the Ways" (137). She asks the reader to consider the relative limitations in the amount and the currency of data that can be stored on CD-ROM versus mainframe data storage available through databases. She also worries about obsolescence. "What if CD-ROM turns out to be the 'microfilm revolution' of the 1980s? A student of the year 1990 walks down the aisle of an academic library's reference collection scanning the bound volumes of an index. Suddenly the books stop and sitting in their midst is a small box-like machine with the dusty edge of a shiny disc protruding. Then the books appear again, but missing years are trapped inside a discontinued technology" (137, p.34). Concerned with technology that may cease to exist, she also
warns against that which never materializes—vaporware. And if all this fails to scare you, consider the specter of laser rot! (87)

Hendley compared traditional publishing media (paper and microfilm) with optical publishing systems (72). Roderer covered the first year of public operation of LC's Digital Optical Disk System (143), described, also, by Manns and Swora in "Books to Bits" (99). Kearns produced user guides for the program (82). The National Library of Canada recently contracted a four-part study to look at data distribution on optical media. The study will consider such things as how Canadian libraries will use optical media and the status of existing and proposed standards in the field (58). Asmus wrote about the use of "Digital Image Processing in Art Conservation" (14). Cooke described the use of CD-ROM for storing maps (52), and Herther considered optical media and preservation (74). Yet another SPEC Kit provided information on storage of and access to optical disks (131).

Choosing items to include from the mountain of material available was difficult. Here is what could be crammed into my allotted space. Discovery of the remaining mass is left to your ingenuity, assisted by the wonders of the electronic wizardry now available for the reproduction of library materials.

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Subject Access Literature, 1987

Diane Vizine-Goetz and Karen Markey

Subject access literature published in English-language journal articles and monographs in 1987 is the focus of this review. Two areas reported in 1986, i.e., the availability of the machine-readable Library of Congress Subject Headings (LCSH-mr) and research on incorporating the Dewey Decimal Classification (DDC) into the subject searching capabilities of online bibliographic systems, set the stage for additional and related work in 1987, particularly on multiple thesauri, subject authority control through LCSH-mr, and the usefulness of machine-readable classifications in online bibliographic systems.

GENERAL WORKS

In a traditional introduction to subject access, Turner (1987) describes catalogs, cataloging, library classifications, and alphabetical subject approaches. Computerized information retrieval is limited to general discussions of Boolean logic, keyword-in-context and keyword-out-of-context indexes, citation indexes, and one microcomputer-based indexing software program called NEPHIS. Mann's Library Research Methods (1987) covers the same traditional areas as Turner's book but also features computerized information retrieval in commercial retrieval systems (e.g., Dialog and BRS), bibliographic services (e.g., OCLC, RLIN), and online catalogs. Education and training for catalogers and classifiers is the theme addressed by library school educators, practicing catalogers, and managers of cataloging departments in an issue of Cataloging & Classification Quarterly. Saye (1987) and Williamson (1987) enumerate general course titles and important topics for preparing students for positions in subject access. Chan (1987) gives the results of an informal survey in which faculty members identify tools and textbooks for teaching cataloging and classification in library and information science programs. Bernal suggests that cataloging and classification courses "move from a narrow, mainly nationalistic to an international approach in which study of the subject areas advances from the particular or national to the general and universal" (1987, 230). Intner (1987a) contends that policy decisions in cataloging departments (e.g., which classification scheme and subject headings list to use, how many subject headings to assign to library materials, or where to shelve library materials) are not only important for students to consider but also for library technical services staff and managers to make and document in writing.

The second edition of Thesaurus Construction (Aitchison and Gilchrist 1987) reflects changes brought about by national and international standards and by the application of computers. Topics covered are planning and design of thesauri, standards, various features of thesauri, forms of presentation, construction tech-

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niques, maintenance and updating, computer aids, and different types of thesauri (e.g., multilingual, merged, and searching thesauri).

Applying computer support to multiple controlled vocabularies in bibliographic systems accessed by librarians and patrons is the subject of Mandel’s report (1987b) written under contract for the Processing Services Department of the Library of Congress. The report (1) surveys the state-of-the-art in computer support of multiple controlled vocabularies, including such support at LC, (2) describes the current multiple controlled vocabulary environment at LC, and (3) provides LC with various approaches for improving its current computer support of multiple controlled vocabularies. Although the report addresses LC, libraries that use more than one controlled vocabulary must resolve many of the same questions regarding computer support of multiple vocabularies.

**CLASSIFICATION: ORGANIZATION, HISTORY, THEORY, AND METHOD**

The 40-year relationship between UNESCO and the Federation Internationale de Documentation (FID) is described by Goedegebuure and Keenan (1987). Cooperative activities in the late 1940s were UNESCO’s partial support of the general secretariat for the Universal Decimal Classification (UDC) and sponsorship of comparative studies of classification systems and codification and recodification of classifications. More recently, UNESCO supported creation of the Broad System of Ordering (BSO) and tests of the system’s efficiency for indexing and retrieval.

Holley (1987) enumerates seven purposes of the Section on Classification and Indexing of the International Federation of Library Associations (IFLA): (1) advocating the importance of subject access, (2) sharing knowledge about current practice, (3) sponsoring research, (4) publicizing international developments, (5) setting standards, (6) serving as a forum for Third World needs, and (7) acting as a clearinghouse for inquiries. Future section activities he considers most important are supporting Nancy Williamson’s research project to investigate the Library of Congress Classification (LCC) in online systems and completing standard-setting efforts on authorities.

Satoh (1987) documents the “Bridge Movement” of Wilhelm Ostwald, Karl Wilhelm Buhrer, and Adolf Saager who were concerned about duplication of intellectual work and lack of formal coordination among scientists. The movement’s principles helped to standardize paper size and are reflected today in an experimental information retrieval system that delivers parts of books (Kilgour 1987). The Bridge Movement did not affect librarianship in Germany because chemist Ostwald presented his ideas on coordinating the acquisition of all publications in a chemistry handbook where “there was no ‘bridge’ between the ‘Bridge’ and its related subjects” (Satoh 1987, 18).

Hunter (1987) documents British contributions to subject cataloging and classification from 1945 to the present. He notes the influence of S. R. Ranganathan on B. I. Palmer, who adopted chain indexing for the British National Bibliography, and on members of the Classification Research Group, who published various classifications and thesauri based on principles of facet analysis and synthesis. Hunter acknowledges Derek Austin’s development of PRECIS and research projects conducted at the Cranfield Institute of Technology; the College of Librarianship Wales, Aberystwyth; Cambridge University Language Research Unit, School of Librarianship and Information Studies at Liverpool Polytechnic; and the Centre for Catalogue Research, Bath. He concludes with progress report on the Bibliographic Classification (BC2), the BSO, and the UDC. Philip Bryant, director of the Centre for Catalogue Research, describes how the centre was established.
The procedure for constructing an analytic-synthetic, freely faceted, depth colon classification schedule for anesthesiology is described by Raj (1987). An analysis of the retrieval performance of Boolean-based systems, word occurrence...
system, and the Colon Classification (CC) leads Shepherd (1987) to conclude that CC yields searches with higher recall and lower precision than searches in Boolean-based systems.

In a textbook with hundreds of examples, Satiya and Comaromi (1987) introduce students to assigning and synthesizing classification numbers using the nineteenth edition of the Dewey Decimal Classification (DDC). Results of a National Library of Canada-sponsored survey of 1,500 Canadian libraries and their uses of the DDC show that 79.4 percent use DDC for classification; DDC use is highest among public libraries (97.4 percent) and school libraries (81.9 percent). Respondents also explain where they obtain classification data, what changes are made, and what editions are used, and rate the usefulness of NLC's assignment of DDC numbers ("Survey" 1987).

Finni and Paulson (1987) describe the Editorial Support System (ESS), an online system designed by Infornetics for Forest Press (DDC publisher). ESS contains union records describing all the main elements relating to a single classification number from the DDC (i.e., both Schedules and Relative Index) and Manual on the Use of the Dewey Decimal Classification. ESS also contains functionality that allows editorial staff to search, retrieve, and edit union records. Four potential applications of the ESS and the DDC database are to: (1) support continuing development and publication of the DDC, (2) aid classifiers in number assignment, (3) enhance subject searching in online bibliographic systems, and (4) organize knowledge in artificial intelligence systems.

A conference at the end of the DDC Online Project brought together thirty participants working in the areas of classification, online subject access, and online catalogs to: (1) review the results of the DDC Online Project, and (2) explore the potential for future use of DDC and LCC in online bibliographic systems. Mandel (1986a) characterizes the discussion by three questions: (1) What subject search enhancements should be incorporated into the next generation of online catalogs? (2) What is the future role of class number searching in online catalogs? (3) How can machine-readable DDC and LCC schedules be used online? The DDC Online Project is summarized in a short article by Markey and Demeyer (1987). Results of this project that are specific to searching and browsing the DDC schedules in online catalogs are featured in a description of the subject outline search that refers searchers to online displays of the classification schedules based on their entry of subject terms (Markey 1987). In a description of the experimental online catalog Okapi, Walker (1987) suggests that DCC or LCC numbers in bibliographic records could be used as relevance feedback in online searches.

The structure of recently expanded DDC schedules for data processing, computer science, and computer engineering is compared to the structure of the 1986 Computing Reviews classification scheme and Propaedia of The New Encyclopaedia Britannica to gain "insights as to how their creators viewed and reflected in the schemes the structure of the computer science field itself" (DeHart and Meder 1987, 41). Dhyanl (1987) examines the relocation, expansion, and phoenix schedule methods used by DDC to accommodate new subjects and suggests efficacious use of these three methods. Hauptman and Berman (1987) criticize the DDC area tables and history schedule for South Africa, which were planned for publication in the twentieth edition of DDC, and recommend the creation of a number to represent the Jewish and Romani Holocausts that began well before the second World War.

The fifth edition of the LC Classification Outline enumerates classes and subclasses of the LCC schedules as of July 1986 (LC SCD 1986b). The fifth edition of Class R, Medicine, available since late 1986, enumerates the subclasses of class R (LC SCD 1986a).

At the IFLA Section on Classification and Indexing, Nancy Williamson reported on her project to determine if LCC can be used in online information re-
trival. Project phases are: (1) to identify characteristics of LCC that affect its manipulation and use online, and (2) to convert a sample of LCC schedules into machine-readable form (Beall 1987).

Jolande E. Goldberg, Law Classification Specialist at LC, provides a commentary on the recently published KJ-KKZ regional schedules for the law of Europe “to minimize the difficulties of classifiers and catalogers who are beginning to apply numbers without benefit of an index or introductory guidelines” (Goldberg 1987, 90).

Culberg and Stewart (1987) discuss difficulties experienced using LC classification for children’s materials at the Chicago Public Library and propose that special juvenile numbers paralleling the full classification be developed throughout the schedules to educate children in the use of LCC.

Staff members of the Rasmuson Library, University of Alaska-Fairbanks, describe an alternate classification scheme they devised to replace portions of the LCC PM Schedule for Alaska native languages and related language materials (Lincoln 1987). The overall format of LCC’s QB schedule for Astronomy “still bears the imprint of its origin in late Victorian times” according to Crovisier and Intner (1987, 23); the authors discuss why the schedule has this appearance, identify current areas of astronomy research that are not supported by the schedule, and suggest changes to accommodate current research.

The American Fiction Project (AFP) of Ohio State University identifies American fiction titles published from 1901 through 1925 with the assistance of OCLC researchers (Smith, Vizine-Goetz, and O’Neill 1987). Computer algorithms searched the OCLC Online Union Catalog and retrieved an estimated 300 relevant titles that were previously unknown to AFP. OCLC researchers recommend two measures to characterize the dispersion of a classification system when mapped to a second classification (O’Neill, Dillon, and Vizine-Goetz 1987). They describe a test of the measures in which the library science portions of LCC (Z6555-Z718.8) and DDC (020-029) are compared and suggest two possible applications of the measures for classification conversion tasks and for broadening a search in retrieval environments.

A U.S. Information Center for the Universal Decimal Classification (UDC) is now located at the College of Library and Information Services at the University of Maryland and serves as a referral center for UDC inquiries and a repository for UDC schedules and related publications (“U.S. Information” 1986). BS 1000 M, the classified part of the English edition of the new International Medium Edition of the UDC, is now available in both printed and machine-readable formats. Henrikson (1987) notes that if machine-readable classification tools are to be used effectively, publishers of those classifications must develop all relevant tools in machine-readable form, libraries must obtain computer resources to support the classification, and additional research must be done to discover methods of exploiting these new tools.

Harris (1987) introduces the Dickens House Classification (DHC), a faceted classification to support an extensive collection of Charles Dickens literature. A classification for three-dimensional vision and imaging (3-D) is devised by Lorenz (1987), who, like the creator of DHC, thinks existing classification systems are not sufficiently comprehensive for specific topics. Chandler (1987) reviews classification schemes employed in local studies (local history) libraries in the United Kingdom.

**SUBJECT HEADINGS AND THE LIBRARY OF CONGRESS**

Many of the activities of the Subject Cataloging Division (SCD) of the Library of Congress (LC) reported here center on by-products and services resulting from
LC's implementation of an online subject authority system in 1986.

LC has made a number of changes to terminology used in LC weekly lists and in the microfiche *Library of Congress Subject Headings* (*LCSH* "1987, 54). The phrase *May Subd Geog* replaces the term *Indirect* to indicate that a subject may be subdivided by place. The terms *see, sa, x, and xx*, for references and tracings, are now *USE* (see), *UF* (used for, formerly *x*), *BT* (broadest term, formerly *xx*), *RT* (related term, formerly *xx and sa*) and *NT* (narrowest term, formerly *sa*). Future editions of *LCSH* will contain this more understandable terminology.

Much of update number 1 to *Subject Cataloging Manual: Subject Headings*, revised edition, issued by LC in February 1987 concerns procedures for creating and revising subject authority records in the online system (LC SCD 1987c). Other topics addressed are revisions to the lists of free-floating subdivisions used under pattern headings and a new instruction sheet listing free-floating subdivisions that may be used under classes of persons. Catalogers' positive reception of the *Subject Cataloging Manual: Subject Headings* led SCD to publish a similar manual that deals with shelflisting. *Subject Cataloging Manual: Shelflisting* (LC SCD 1987b) provides practical guidelines for creating cutters consistent with LC practice.

In June 1987, LC's Cataloging Distribution Service (CDS) announced the development of *CDMARC Subjects*, a prototype CD-ROM product containing the LC subject authorities database ("CDMARC" 1987). Several library test sites are evaluating the retrieval software, screen displays, and general usefulness of the product. *CDMARC Subjects*, fully cumulated and updated quarterly, should be available in 1988.

At a Subject Analysis Committee (SAC) meeting during the 1987 American Library Association (ALA) Midwinter Meeting, LC first revealed that it was considering a proposal to change from indirect geographic subdivision to direct local subdivision ("Direct" 1987a). Explaining that indirect subdivision may be no longer necessary with the retrieval capabilities available in online catalogs, LC invited comment from the library community on this issue. Studwell (1987e) discusses the pros and cons of LC's proposal. Having evaluated response from the library community, LC announced at a recent ALA committee meeting that it would continue to use indirect subdivision for the following reasons: (1) many libraries still use card catalogs, (2) several online catalogs do not have keyword searching with truncation, and (3) the amount of work required to update both card and online catalogs is probably not justified ("Direct" 1987b).

No separate listing of period subdivisions established by LC has been produced since 1976 when all were printed in the 1974–76 supplement to *LCSH*. Since then period subdivisions have appeared in the main volumes of *LCSH*. However, a new edition of *LC Period Subdivisions under Names of Places* (LC SCD 1987a) is currently available. Additional period subdivisions for Canada's regions, provinces, and territories are proposed as are additions to period subdivision for individual American states (Studwell, 1987b-c).

A proposal to change the authorities format calls for changes to byte 2 (Earlier Cataloging Rules Code) of control subfield ǂw to provide a means of indicating that a 4XX tracing is an earlier form in which a name heading was established, or an earlier form in which a subject heading was established ("Marc" 1987).

*LCSH* once again received positive and negative reactions. While calling for the development of a theoretical code for LC subject headings, Studwell, in a series of short articles (1987a,d,f), commends LC for improvements in structure, terminology, and specificity, and for its publication of the *Subject Cataloging Manual*. Benemann (1987) suggests LC's subject headings for current cataloging reflect 1980s American society.

Henige (1987) proposes a periodic review of *LCSH* by librarians and scholars as
a possible remedy for inaccurate and inconsistent LC subject headings and cross references. In a response, LC reaffirms its willingness to correct truly erroneous headings, reviews the purpose of LCSH, and defends the scholarly credentials of its subject catalogers (“LC Response” 1987).

Based on a survey of current usage and an analysis of reference source titles, Chammou (1987) concludes that “Middle East” should replace LC’s current “Near East” heading. Teen-related language in LCSH is examined for inconsistencies and bias, and subject headings for teen-related works established by Hennepin County Library and LC are compared (Berman 1987). Huston (1987) describes prejudice in LCSH.

Herz (1987) investigates the use of LCSH for books of and about scientific illustration in several Boston area art libraries. She reports that “while each uses a number of subject headings provided by LCSH, these rarely provide a clear path to relevant materials” and that the subject heading “Scientific illustration” is underused in smaller libraries and in art libraries with few scientifically oriented materials (Herz 1987, 239).

Khosh-khui (1986) analyzes a sample of subject headings in LC MARC records to study the relationship between the specificity of subject headings and the total number of headings assigned to a monographic item. The findings indicate that more specific subject headings (i.e., those with more subdivisions, words, or characters) do not reduce the average number of headings per record. A follow-up study reports no significant relationship between the length of LCC and DDC notations and the degree of subject specificity (Khosh-khui 1987).

The Council on Library Resources (CLR) awarded a grant to the University of Michigan School of Information and Library Studies and OCLC Online Computer Library Center to explore automated techniques to guide online users from their search terms to the subject headings and term relationships in LCSH (CLR 1987). The initial phase of the research is a statistical analysis of LCSH-mr records. A subsequent phase determines how subject headings in authority records and in bibliographic records can be linked effectively and manipulated by users of online bibliographic systems.

Catalogers in a large research library analyze subject headings in OCLC member contributed records input by research, academic, and public libraries to determine the number and type of revisions performed to achieve conformance with local practices (Salas-Tull and Halverson 1987). The findings indicate that less than 5 percent of the subject headings require revision for tagging, spelling, and capitalization variations.

SUBJECT AUTHORITY CONTROL THROUGH LCSH

Topical and geographical subject headings in bibliographic records are sampled from a large research library’s shelflist and compared to the tenth edition of LCSH to provide data for libraries planning to implement automated subject authority control through LCSH-mr (Frost and Dede 1987). The researchers ascertain the extent to which complete headings, main headings, and subdivisions match LCSH.

SUBJECT SEARCHING IN ONLINE CATALOGS

A smorgasboard of tactics to further online database searches is described (Bates 1987). For searches producing too few or no postings Bates recommends looking for spelling and spacing variants of entered terms and using truncation. Walker (1987) suggests similar techniques for improving subject access in online catalogs. Automatic stemming, synonym and cross-reference tables, and Soundex-based correction of keying errors are explored using two versions of
Okapi, a control and experimental system (Walker and Jones 1987). The control system incorporates weak stemming (i.e., the removal of s, ed, and ing from search terms) and the experimental system supports both weak and strong stemming (additional removal other suffixes), synonym and cross-reference tables, and automatic spelling correction. An evaluation of the two systems' search results leads the researchers to conclude that all the techniques could be employed as recall improvement devices in online catalogs.

Two companion studies investigate student and faculty use of subject searching in a university card and online catalog. A comparison between members of a science/engineering faculty and of a humanities/social science faculty reveals that, while about equal percentages of both groups use subject searching in card and online catalogs, science/engineering faculty members are more likely to use it frequently in both types of catalog (Frost 1987a). When students were asked about subject searching in the online catalog, a majority indicated that they are unaware of LCSH as the source of the catalog's subject terms even though they frequently search by subject (Frost 1987b). The top three catalog enhancements most preferred by both faculty and students are "(1) the capability to combine subject terms; 2) the inclusion of a brief summary of the book's content in the catalog record; and 3) a feature for viewing a list of terms that the catalog uses as subject headings" (Frost 1987b, 62).

Impact of an online subject catalog in a large research library is assessed by studying catalog use before and after the introduction of the online system (Lipetz and Paulson 1987). Results of this study confirm previous findings that users readily accept online subject catalogs and that the proportion of subject searches conducted increases with the introduction of online searching. The authors attribute the increase in subject searches to use by previous nonusers of the public catalog.

A study of online catalog use at a Saudi Arabian university shows subject searching to be the most frequent search pattern (Ashoor 1987).

Another study examines the use of a printed PRECIS index and shelf browsing in a university library as a basis for an examination of online subject searching behavior (Hancock 1987). About 44 percent of PRECIS users formulate a search broader than their expressed topic and 52 percent an exact match. Of those who initiate their searches at the shelves, 65 percent take a broad search strategy. Searchers tend to retain their broad search strategy as they match their queries to titles, consequently producing more matches but often fail to retrieve books whose entire contents are more specifically on their topic of interest.

Logan (1987) describes the development of subject searching and subject authority control in LCS, the online library catalog of the Ohio State University. Online catalog design features and users' mental processes that contribute to errors are discussed with respect to a study of first-time users of LCS (Janosky, Smith and Hildreth 1986). Only 44 percent of users instructed to find all books on "television, cable" complete a successful subject search.

Hildreth (1987) reviews the state-of-the-art in online catalogs and recommends multiple search approaches that combine the use of free-text search words, subject headings, and class numbers to optimize subject retrieval. Dwyer (1987) offers numerous suggestions for improving online catalogs to stimulate effective library use. Results of card and online catalog use studies are summarized by Lewis (1987). He concludes that the next generation of online catalogs will be defined by improvements in subject searching capabilities. Wykoff (1987) traces the role of subject headings in online searching, suggesting the best years for controlled vocabularies are still to come.

Guidelines for online catalog displays are presented with examples of different types of displays, including displays of subject authority data (Matthews 1987).
OTHER SUBJECT HEADING SYSTEMS AND SUBJECT ACCESS APPROACHES

A research project to develop an expert system that employs the heuristics of a skilled reference librarian to provide subject access is in progress (Macco and others, 1987). Weinberg (1987) contends that subject indexing fails to serve the needs of the scholar because the aspects or points-of-view of a subject that interest a scholar are not represented.

An analysis of MARC records with summary or contents notes reveals that such notes contribute a large proportion of subject-rich words in bibliographic records and further confirms the potential of book’s tables of contents and indexes for enhancing subject access in online catalogs (Markey and Calhoun 1987).

Mitchell (1987) and Ochs (1987) address the topic of providing access to computer software. Both recommend that subject headings and classification numbers should be applied to software with much the same criteria as other materials to facilitate patron access and to permit the physical integration of software into the collection.

The need for better subject access to fiction is the focus of three articles. Intner (1987b) contends that access to fiction could be significantly improved if libraries adopt a uniform arrangement, by time period, language, or nationality rather than using diverse treatments within a library. She further challenges librarians to make decisions about assigning subject headings to fiction based on the potential educational value of fiction itself and not on whether a work purports to tell the truth or be of the imagination. In a survey of the research on fiction classification in public libraries Shepard and Baker (1987) review the principles of classifying fiction and report that classifying by genre helps library users to find the kind of book they want. McKenna (1987) describes a software system that uses nineteen subject categories identified by teachers, school library media specialists, and children to provide subject access to children’s fiction.

The Unified Medical Language System project of the National Library of Medicine (NLM) continues its efforts to develop links among medical vocabularies and classifications. With planning and problem assessment complete, contracts were awarded to develop tools and perform studies needed to design a functioning system (“Unified” 1986). For its part, NLM is investigating methods for mapping thesauri, particularly Medical Subject Headings (MeSH) to Physicians’ Data Query, developing search questions for evaluating research results, and conducting research to improve retrieval interfaces. Rada (1987) reports on various experiments in automatically connecting the MeSH with other medical thesauri. In a study supported by NLM, Masarie and Miller (1987) find that about half of the vocabulary used by health professionals on hospital charts are MeSH-related terms. A separate analysis of MeSH term usage patterns shows that an increase in postings of existing terms does not predict areas likely to have new terms added (Backus, Davidson, and Rada 1987). The researchers also find that patterns of MEDLINE searching fail to correlate with the distribution of terms in MeSH trees, suggesting areas of MeSH may need expansion to help searching. Lansing and Edmondson’s (1987) examination of indexing patterns for occupational therapy literature in MEDLINE and NAHL shows that similar access is provided in the printed indexes, although MEDLINE’s abstracts may provide additional useful search terms for practitioners. Structures of tropical medicine derived from signs and symptoms for tropical diseases and signs and symptoms applied to articles on tropical diseases indexed in MEDLINE are compared (Wood 1987). Finding no correlation of the structures, Wood suggests that indexing with signs and symptom index terms or check tags may improve access to the MEDLINE database. A final article describes the Indexing Aid Project of NLM (Humphrey
and Miller 1987), which hopes to develop interactive knowledge-based systems for computer-assisted indexing of medical literature indexed in the MEDLINE database.

Dykstra (1986) is the editor of a collection of five papers on PRECIS. The first paper by Jack Cain describes integrating PRECIS into the products and online services of UTLAS. The catalyst for UTLAS development is the National Film Board of Canada (NFB) which administers FORMAT, a Canadian audiovisual information system. In a separate paper on FORMAT, Dykstra describes online searching and retrieval using PRECIS strings in a local system developed at NFB and the production of various printed catalogs including Film Canadienne by UTLAS. Chor assesses the feasibility of applying PRECIS to produce a subject index in Chinese. Smith enlists a microcomputer to help students at Loughborough University learn how PRECIS strings are generated. Chipman establishes a theoretical basis for the subject analysis of historical photographs and slides and tests PRECIS as a subject access approach.

The appearance of the eleventh edition of the Thesaurus of ENC Descriptors (Educational 1987) coincides with the twentieth anniversary of the ERIC database. "The 1987 edition contains 9,459 vocabulary terms, of which 5,296 are main-entry Descriptors and 4,163 are non-indexable. . . . This edition also reflects several hundred Scope Note and cross-reference modifications to earlier Descriptors displays" (v.).

The LC Thesaurus for Graphic Materials (LCTGM) (Parker 1987), developed in the Prints and Photographs Division of LC, offers catalogers and researchers a controlled vocabulary for indexing and retrieving subjects in the area of graphic materials including prints, photographs, and drawings. The introduction to LCTGM also contains basic guidelines for pictorial indexing.

A Women's Thesaurus ("Women's" 1987) is a source of nonexist, standardized vocabulary for describing topics of special concern to women. The thesaurus is designed to use entry forms appropriate for automated retrieval systems and to be compatible with existing controlled vocabularies whenever possible. Terms are presented in alphabetical, permuted, hierarchical, subject group, use/do not use, and delimiter displays.


Macey and Benyo (1987) examine the viability of employing specialized classification and subject heading schemes (non-LCC/DDC or LCSH) for Catholic theological literature in the age of machine-readable shared bibliographic data based on LC cataloging. Reid (1987) voices concern about how readily database producers and publishers will adopt the 1987 revision to the Standard Industrial Classification (SIC) codes. SIC codes were originally developed by the federal government for statistical data but are also used by database producers and publishers to code information about businesses and industries.

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IN MEMORIAM:

BETTY CARHART

Betty Carhart, a longtime RTSD member, passed away on June 4, 1987, after a long illness. Her first professional post after graduation from the University of Denver Graduate Library School was that of librarian of Greenlee Elementary School, followed by an appointment as assistant librarian at South High School in Denver. In 1959 she became the chief librarian for a large, new school in south suburban Chicago and served as secretary of the American Association of School Librarians.

Betty spent a year as the assistant cataloger at Roosevelt University in Chicago and in 1965 became chief cataloger at the Center for Research Libraries. In this capacity, she oversaw the compilation of and edited the first printed catalogs of the CRL. Settling in the New York area in her later years, Betty edited two editions of the Metro Cap catalog—a record of cooperative holdings of expensive and seldom held research materials in participating libraries—as well as doing extended substitute work in academic libraries.

Active in the International Federation of Library Associations and Organizations (IFLA), Betty visited libraries in most countries of Western Europe as well as several in Eastern Europe.

Surviving are Betty’s husband of twenty-eight years, Forrest F. Carhart, Jr., of Denver, and a daughter, Sharon.
Research Methodology in Technical Services: The Case of 1987

Geraldene Walker and Judith Hudson

The terms library science and information science (and, indeed, many other "sciences") are used rather casually. The scientific approach attempts to establish general laws covering the behavior of events or objects and to recognize a pattern among separate items of information that can be used to predict future events. Scientific research involves the controlled investigation of these relations. It is aimed at the establishment of theory, a set of general concepts to explain the relationships among variables. A selective approach is taken here to the reporting of the research in technical services published in 1987, based on the research methodology used. Studies where methodology is not clearly defined and discussed have been deliberately excluded.

RESEARCH DESIGN

Kerlinger (15) identifies four basic types of scientific research, providing a useful typology for the research projects covered in this review. They are

- Laboratory experiments, in which the research situation is isolated from extraneous influences, providing tight control over the variables to be manipulated;
- Field experiments, where variables are manipulated in a more realistic setting well suited to testing theories and solving practical problems but often involve problems with randomization;
- Field studies, usually ex post facto and real-life, useful for the solution of practical problems and for the discovery of new facts and relationships;
- Survey research, involving the use of survey instruments and questionnaires, usually based on the study of a sample used to represent a total population.

Most research in our field falls into either field study or survey research. A major problem, common to all research in the social sciences, is the need to control environmental factors and use sociological, psychological, and behavioral variables. Most of the research reported this year falls into these two categories.

CATALOGING

The themes in cataloging research reported here are similar to those of the past few years: evaluation of the impact of automation, identification of more efficient cataloging procedures, and efforts to improve access and to automate procedures.

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further. Cataloging studies fell into two categories: surveys and field studies. The surveys used mailed questionnaires.

A study of the use of academic dissertations by extramural scholars, presented by Repp and Glaviano (25), includes, in a clearly identifiable fashion, all the elements of a research study. This carefully presented study might serve as a model for the preparation and presentation of descriptive research.

After presenting the rationale for the study and a review of the literature on bibliographic control of dissertations, the authors state the purpose of the study, the hypotheses they are testing, and the assumptions they have made. Questionnaires were sent out with all dissertations borrowed through interlibrary loan over a twelve-month period from four Ohio academic libraries. Data were processed by the SPSS statistical package using descriptive statistical routines. Analysis of the data led the authors to point out that:

- most dissertations are used to produce other scholarly and theoretical work;
- dissertations are borrowed most heavily by Association of Research Libraries (ARL) members, but also by other university libraries;
- more recent dissertations are requested more frequently;
- access is achieved more often through indexes and abstracts, most commonly through Dissertation Abstracts International (DAI) and its related products, than through other sources; and,
- the most common approach is by subject.

The conclusion of interest to catalogers and cataloging administrators is that including Library of Congress Subject Headings in cataloging records for dissertations may not be of sufficient benefit to extramural users to justify its expense, especially if the library participates in the DAI program. The authors identify areas of further research, including the relationship between anticipated use of dissertation information and choice of search tools or search terms for locating relevant information, and the study of content and coverage of the various dissertation indexes.

Implementation of local online systems continues to be evaluated. Eppler and Ginder (8) surveyed ARL libraries with operational online catalogs to determine the status of the public card catalog, the shelflist file, and the capabilities of the online system with regard to traditional shelflist functions. Three research questions were formulated on the ability of the online systems to provide data necessary to perform typical technical services operations; factors affecting the continuing maintenance of card files after system implementation; and criteria for determining when to stop producing cards, stop maintaining the shelflist, and close the card catalogs. In a sixteen-item questionnaire published with the report of the study, respondents were asked to describe the level of card catalog and shelflist file maintenance, the criteria (or anticipated criteria) for establishing closing dates for either file, and the functions incorporated into the online system allowing for closing and discarding the shelflist. Two types of questions were included: open-ended and those asking respondents to check off all applicable responses from a supplied list. In some cases, the supplied answers did not reflect all possible answers.

Survey results are clearly presented with many tables detailing the findings and discussion of the capabilities of online systems for traditional shelflist functions. The authors conclude that, while online catalogs can adequately replace public card catalogs, most libraries will continue to maintain the shelflist until online systems provide the same information and perform the same functions as card versions of the shelflist files. Criteria that determined when to close the shelflist were the drain on resources when two systems were maintained, filing backlogs, percentage of the collection covered by the online database, and stability and functionality of the online system. The authors suggest that functions of the shelflist
may seem more difficult to replicate because system requirements for an online shelflist have not been defined adequately.

Observational studies in cataloging range from field studies analyzing availability of cataloging records in the database of a bibliographic utility to field experiments determining whether automated title-page cataloging is feasible. In order to develop a more efficient copy cataloging work flow, Struble and Kohberger (32) studied the availability of LC cataloging for monographs at the time of receipt and again six months later. For six months all monographs (except those in Slavic languages) were searched in OCLC upon receipt for LC cataloging copy. Those with LC copy were cataloged immediately. Those lacking LC copy were stored and searched again six months later. Publisher data (foreign versus domestic), publication data, and language and type of cataloging copy available on OCLC were collected and stored on a microcomputer diskette using Lotus 1-2-3.

Analysis of the data led to recommending adjustments to the searching work flow based on place of publication, publication date, and language. They were later revised to one based solely on date of publication. The authors concluded that the revised searching work flow is more efficient because items with LC copy are processed first, and only those likely to receive LC cataloging are retained for later searching. Items unlikely to be cataloged by LC are cataloged directly using member copy or given original cataloging. The methodology used in this study was simple but appropriate to the problem.

Changes to serial cataloging records input into OCLC were the subject of a study by Barrett and Madison (2). Original serial records input over a fourteen-month period were examined eighteen months after the last record was input to determine the number of times a record was used by other libraries and the role of CONSER in upgrading records. Copies of each upgraded record were compared with the originals and changes by tag and type were tallied. On the basis of their findings, the authors recommended that OCLC allow inputting libraries to replace data on any of their records that have been used only for cataloging and not for CONSER, that CONSER expand its membership, and that CONSER libraries change records only to correct data that contravene AACR2 and national LC/CONSER policies or to add required data, not to reflect individual cataloging preferences.

OCLC reported a number of research projects in progress involving use of its Online Union Catalog (1). Two studies were experimental while the rest were descriptive.

The presence of bibliographic records in the OCLC database and the rate that institutional symbols are added to them were determined by monitoring records for newly announced monographs in the fields of health sciences and fiction in a study reported by Shaw (31). Fiction titles were selected sequentially from Publishers' Weekly forecasts for a seven-week period, and health sciences titles were selected similarly from vendor notification forms for that period. The OCLC database was searched weekly for each selected title. When a bibliographic record was found, the date of entry into the OCLC database and the number of holding libraries were recorded. Subsequently, the number of additional holding libraries was noted each week. Most of the titles were present in the database at the time they were announced. Fiction titles had significantly more holdings symbols than health science titles. Taking the sample as a whole, a relationship between the date that the record entered the database and the number of holdings became apparent. Surprisingly, the records entered earliest and those most recently entered had fewer holdings symbols than those entered during an intermediate period. Analysis continues, but the findings so far confirm that cataloging records for most U.S. trade publications are available in the OCLC database.

Two experimental studies are investigating automatic cataloging from title
pages. Weibel (38) developed and tested a prototype system that generates descriptive cataloging from machine-readable monograph title-page images. The system was designed to identify seven bibliographic subfields in the title, imprint, and edition fields of a MARC record. The tasks involved capturing a page image in machine-readable form, identifying functionally related text strings from the page image, and assigning the text strings to appropriate bibliographic subfields. The title pages were encoded into preprocessing datafiles, which were then read into data structures called *tokens*. The tokens, which reflect the position, size, font style and case of each character string on the page, are then added together until the font style or font size changes or vertical white space separating successive tokens exceeds a specified threshold. Bibliographic subfields are identified by applying a set of sixteen rules to each of the combined tokens. Initial tests were run with a sample of twenty-six monographs. Overall, 75 percent of the fields were selected correctly, and half of the title pages were captured correctly. Preliminary results of the project indicate that title pages have a discernable grammar and that a majority of them can be processed using a limited set of rules based on that grammar.

An ongoing project reported by Svenonius (33) investigating automatic cataloging involves derivation of name access points from machine-readable title pages of English-language monographs. The research asks if criteria can be specified for extracting names of individuals and corporate bodies making significant contributions to the creation of the monograph from machine-readable title pages, and if title-page data are adequate for automatic generation of appropriate name access points. Assumptions of the project are carefully delineated, and the independent variables identified. Sample size was determined statistically and stratified samples of equal size were drawn from a large public library and a research library system. All personal and corporate names, together with locational and contextual information were gathered from each title page. The names were run against two computer algorithms, one for personal names and another for corporate names. The names were then compared with data collected from OCLC records input by the National Library of Medicine (NLM) for each title in the sample. Analysis of the data is in progress, and preliminary results indicate that the algorithms correctly identified 93 percent of the personal names and 80 percent of the corporate names. Conversely, only a few names found on the title pages were not used by LC or NLM.

In the past few years, a number of libraries have enhanced subject access to records in their online systems by adding data from tables of contents (4, 23). A research project now underway evaluates the effectiveness of this type of enhancement (16). Online catalog records for a sample of library science and journalism monographs are being enhanced with tables of contents that can be displayed and searched in an online system. Tables of contents are being entered in two steps, with the most general level first (e.g., chapter headings) and the more detailed levels second (e.g., chapter units). Once the sample entry is completed the evaluation will compare the enhanced system with the same one without the tables of contents. A user survey also will be conducted to assess reactions to the enhanced online system.

The extent and nature of variation from LC practice in the formulation and assignment of subject headings in the OCLC database is under investigation by Chan (5). Four hypothetical patterns of variation have been postulated. A sample of MARC records contributed by libraries other than LC were selected and checked after a few months in the database to determine if they had been replaced by LC records. LC records found were paired with the original records and compared to note the types of variation, to codify the pattern of each variation, and to tabulate the extent of variation within each pattern. The project may serve as a pilot study
for future investigations of subject headings on a larger scale or as a model for studies of variations in assigning classification numbers by OCLC member libraries.

A similar methodology was used by Salas-Tell and Halverson (26) in a careful study of revisions made to subject headings on member records in the OCLC database. In an effort to evaluate the need for revision of subject headings assigned by OCLC member libraries, the study was designed to determine the total number of subject headings being revised, the categories of revisions, and the amount of subject heading revision necessary for records input by research, other academic, and public libraries. A random sample of records from the library's local database was compared with original records on OCLC. All AACR2 records input by member libraries were retrieved and sorted by type of library. Records from each type of library were compared with the original record on OCLC. The results of the study are explained clearly. Capitalization of subject headings and errors of form in geographic headings were the most common errors. Few tagging errors and no spelling errors were found. Overall, about 20 percent of the records required revision. Those input by research libraries required the least revision while public library records required the most changes. On the basis of the findings of this study cataloging procedures were changed to accept cooperative copy without revision. The authors suggest that catalogers at other libraries may wish to make the same analyses and suggest that loss of subject access, effectiveness of cataloging routines, ratio of cooperative cataloging records to total records processed, and acceptable error rate be considered before procedures are changed.

**SUBJECT ANALYSIS**

Subject access research in 1987 tended to be more experimental in nature, testing a range of variables in controlled environments. Two large ongoing research projects, supported by major institutions responsible for the production of large bibliographic databases (OCLC and NLM), are worth reporting in some detail in view of their highly developed methodology and their potential to engender research in a variety of subject-related areas.

The Indexing Aid Project (12) sponsored by NLM is probably the most innovative and ambitious of this year's investigations. It is aimed at developing and testing an interactive knowledge-based system for computer-assisted indexing and retrieval of journal material in the MEDLINE database. It resulted from identification of problems with the standards and consistency of current manual indexing and still is in a developmental stage.

An experimental, frame-based knowledge representation language, FrameKit, is used enabling development of a set of data structures (the frames) derived from a computerized knowledge base, which can be viewed as an extension of *MeSH* terms. These frames make it possible to express explicitly the multidimensional relationships among concepts and to build other document-specific frames that provide online assistance for indexers. Indexing rules are encoded in the system, providing the possibility of interactive indexing.

Three types of entities are represented in the system: documents, knowledge, and journals. Generic frames comprise the knowledge base; there is one generic document frame and one generic journal frame. Frames are linked to related frames by *slots*, which identify the type of relationship (author, title, source, etc.). The knowledge-base frames represent indexable knowledge entities in the medical domain for processes, procedures, biological structures, and chemical substances. These are the same sorts of entities that appear in *MeSH*, but are encoded as a semantic network, where relationships are expressed explicitly.

At the indexing stage, the system brings knowledge entities to the indexer's attention and suggests associated relations with slots in the frames. Indexers enter
values in response to the suggestions, which cause the display of additional frames. The indexer inputs fire rules, which are checked when values are added. Based on these rules, the values are either incorporated as new slots or rejected as errors. The system also incorporates inheritance (a basic concept of the MeSH tree structure), i.e., the ability to automatically transfer slots and their contents based on hierarchical relationships.

A pilot version of this design is currently being tested and will need expansion before testing its performance as an indexing aid can begin, so no results are available. The most exciting part of the project is its potential for future development in a whole range of associated areas, e.g., design of an indexing model and development of new indexing rules, automatic updating of MeSH and the knowledge base, adapting the indexing module to a search module, and automatic classification from natural language input.

The second project is a statistical analysis sponsored by OCLC (22). It compares the effectiveness of two different measures for characterizing the dispersion of a class from one classification scheme when it is transferred to a second scheme. The two schemes compared are the Dewey Decimal Classification (DDC) and the Library of Congress Classification (LCC). Two measures were developed based on: distance—an adaptation of the statistical measure of variance (standard deviation) to measure the physical spread of a class from one system when represented in the other; and scatter—using rank-frequency analysis, to identify the spread of a class in one system among the classes of the second system.

The measures were tested using a portion of the LC MARC Class File created at OCLC. It contains a record for each LC MARC record added to the OCLC Online Union Catalog before April 1984 that met the following criteria:

1. Bibliographic level m, meaning monograph material.
2. Encoding level “blank” or I, meaning the most complete records from the Library of Congress.
3. Fields 050 and 082 present, meaning “official” LCC and DDC numbers assigned at the Library of Congress.

The database consisted of 10,797 records from the field of Library Science (Z662–1000.5 in LCC and 020–029 in DDC), with an overlap of 7,283 records.

Large numbers of items were found to fall within a relatively few large classes and interest centered on those classes containing three or more items. A comparison of the two measures identified four dispersion patterns: (1) low distance and low scatter; (2) high distance and high scatter; (3) high distance and low scatter; and (4) low distance and high scatter. Pattern one implies good mapping from one scheme to the other and included a few large classes. Pattern two maps poorly, usually including classes not available on the other scheme. Both patterns three and four are good on one measure, but poor on the other, often due to the presence of an outlying topic requiring special treatment.

The authors conclude that the measures tested are effective in identifying classes that map badly and classes that map well between the two systems. The other two groups need further investigation. The next stage is a move to the full LC MARC file to test the application of the measures in other subject areas. Potential uses for such algorithms are automatic conversions from one scheme to the other or using class numbers to broaden a search in an online retrieval environment. However, any classification scheme is bound to have a percentage of distributed relatives, which an automatic mapping algorithm of this kind will not cover.

Two other OCLC-sponsored research projects relating to improvement of subject access are laboratory experiments currently in progress. The first (27) is aimed at automatic identification of phrases in titles and abstracts that can be used to represent document content in retrieval systems. Most methods for identifying term combinations are based on statistical term associations and the relative loca-
tions of terms in text and have not been good indicators of document content.

Salton’s syntactic phrase construction method decomposes complex constructions into simpler forms, while still preserving most of the syntactic relationships among words, and normalizes the form of constructions that differ but are closely related semantically. The phrase generation algorithm traverses the tree structure that represents a parsed sentence and, at each node, combines the head of the constituent at that node with the head of each modifying constituent. This procedure has been applied to an experimental collection of 1,460 documents and 76 sample queries. The next stage will test the effectiveness of the phrase indexing method. With appropriate refinements and extensions, this strategy may also be applied to the construction of entries for printed subject indexes.

The other OCLC project, reported by Markey and Vizine-Goetz (19), is concerned with increasing the accessibility of Library of Congress subject headings in online bibliographic systems. The availability of the LCSH in machine-readable form provides a source of authorized subject terms and term relationships that could assist users with the selection of search terms in an online catalog. Virtually all online catalogs currently require that users enter exact matches of subject headings or words in subject headings and fail to provide guidance when terms that do not match are used. This research tests and evaluates an automated technique to link assigned subject headings from bibliographic records with the best match of an LC subject heading. Such links would increase the chances of obtaining related term information for LC subject headings and assigned subject headings in libraries’ bibliographic records.

Such information will affect indexing of and file design for subject authority records from the machine-readable LCSH and provide recommendations for searching and the manipulation of user inquiries when they are not expressed in the “correct” controlled vocabulary.

**AUTHORITY CONTROL**

Three studies address authority control in the online environment. To project the impact of automated authority control on the cataloging process, Franklin (9) searched all the personal, corporate, and geographic names found on a sample of records cataloged using AACR2 against the LC Name Authority File (NAF). A separate sample of records in pre-AACR2 form were also searched. The methodology was simple: each heading was searched against the NAF on the OCLC terminal or in the microfiche edition, and hits or misses were tallied. Names in subject headings were searched, but subdivisions were ignored. High levels of match for both current and older records led the author to anticipate that automation of authority control will be very efficient for current cataloging. Bringing the retrospective headings under authority control will require more attention. The findings of this study differ significantly from an earlier study by Ludy and Rogers (18), but the author points out differences in research design and suggests other explanatory factors. The results of this study might be useful in convincing administrators of the benefits of investing staff time and library resources in the automation of authority control.

Another approach to determining the potential benefits of authority control is currently under investigation by Saye (28). The names searched on an online system for five weeks were identified, and the searches will be repeated to determine which records were retrieved. When bibliographic records are identified, the OCLC database will identify the form of the name appearing on the title page and the online authority file search to identify variant forms under which the name might appear. All name searches will be evaluated on the basis of the role that authority information might play in retrieving records under that form of the name. Further analysis will include the effect of name indexes on retrieval and the
effect of truncation and Boolean operators on online searches, although the methods by which these areas will be investigated are not explained. The data also may allow for comparison of title page name forms with established and variant forms found in NAF authority records.

Watson and Taylor (3) investigated the relationship between sophisticated searching capabilities and the need for certain types of name records and/or name references in automated authority files. Their purpose was to evaluate the need for full MARC authority records for every name heading. A statistically determined sample of authority records for name and corporate headings was selected from the NAF using random numbers. The records were sorted into two groups: those with references and those without references. The references on the authority records were sorted into various categories, such as surname differences and forename fullness for personal names and first word differences, abbreviation, and inversion from subject word for corporate names. Each category of reference was evaluated in terms of its necessity in MELVYL (the University of California online catalog), which has sophisticated searching capabilities relevant to this study. The authors describe these capabilities briefly—keyword searching automatically utilizing the Boolean AND, automatic right-hand truncation, and the ability to strip out embedded punctuation—and refer the reader to an earlier study by Thomas (35) describing these features more fully.

Watson and Taylor’s results indicate that approximately 65 percent of the name authority file would not be needed in an online system that provides MELVYL’s searching capabilities and that does not require an authority record for a name heading without references. This finding relates to the use of authority records and references as aids to access, not the value of authority records as aids to cataloging for future researchers. The study confirms the findings of a 1986 study by Jamieson et al (13) on authority control versus keyword searching, which found that half the author headings could be accessed by keywords linked with Boolean AND operators.

Readers unfamiliar with MELVYL must search further for details of the search capabilities to which the authors allude, and an explanation of the criteria used to categorize the reference types as necessary or unnecessary would assist understanding. Because the conclusions are so drastic, more thorough description of the data analysis might make them clearer and help to defuse some of the “strong reaction” anticipated by the authors (38, p.18).

USE OF THE ONLINE CATALOG

Three very different approaches demonstrate the breadth of questions relating to online catalogs—library policies, the user interface, and user searching.

In user access, an RLG-funded investigation of the effectiveness of a variety of display formats for an online public access catalog was reported. (7). This Patron Access Project tested a range of variables for incorporation into the design of bibliographic displays for a patron access system in an online catalog based on RLIN software. Areas of interest include appearance, effectiveness, levels of detail, and arrangement of the records.

Sample size requirements depended in part on the variability of the population being studied, and, since bibliographic records vary widely, a large representative sample was necessary. The RLIN Monthly Process File of approximately 400,000 records, regarded as representative of current cataloging and retrospective conversion work (at least for the large research libraries that provide the major input to the RLIN system), was used. The first stage of the project prepared programs to generate sample screens and measure the space required for a variety of designs. Table-driven modular programs based on the standard RLIN Report System software were developed, so that many current routines could be used without modifi-
cation. Early tests included a range of different overall screen designs, options for data to be displayed, and other labeled and unlabeled possibilities. One problem was that each display differed in so many ways that it proved difficult to evaluate what each change meant. It was important to see the same record displayed using different alternatives and it became clear that records for nonbook materials needed special treatment.

Once basic decisions were reached on a standardized screen format and the contents of three display levels, a series of display alternatives were established, changing only one element from one display to the next. This made it possible to focus on the specific effects of different display decisions.

This narrow testing resulted in several hundred directly comparable displays and several thousand statistics. From this wide range of data a few patterns were established. Labeled displays are more legible, but take up more room than cardlike displays. The combination of right-aligned labels and left-aligned text ("gutter alignment") works well, allowing experienced users to ignore labels while keeping them clear for less experienced users. Local density (the percentage of all available space used for text) should not exceed 30 percent of the screen, and lower ratios are even better.

The full report of this project (6) includes many more display designs, hundreds of sample screens, and more complete explanation than in this article. It also includes three additional categories of statistical information—holdings room, field occurrence and average length—and format specific results. A major limitation of this interesting analysis is that all displays were tested in printed form, which is very different from screens in terms of size, color, clarity, etc., and made testing of highlighting impossible. This report adds to the fund of information gradually being accumulated regarding the effectiveness of a myriad of possible variables available for incorporation into the ideal user interface to the online public access catalog.

Taking a similar pragmatic approach based on a queuing model developed by earlier writers (17,36), Taylor (34) compares the number of online catalog terminals required for sixteen different service plans. Two groups of policies are discussed: the average time a client must wait for a terminal (four variants); and the probability of having to wait more than x minutes for a terminal (twelve variants). The maximum number of terminals considered was twenty-five.

Tables are presented for sixteen different possibilities covering a band of arrival rates, service rates (session length), and number of terminals that span the values previously reported in the literature. Their use requires knowledge of the arrival rates and session lengths for an individual situation, based on the average of peak figures. One problem is the likelihood of great variability between peak and nonpeak periods. Nevertheless, the tables provide useful benchmarks for library decision making regarding the numbers of terminals required under various circumstances.

The other two investigations make use of surveys to address questions about subject searching in the online catalog. In the first (11), Frost attempts to find out to what extent do users search by subject; why is the subject search not used by some users; what is the response to an unsuccessful search; what improvements to subject searching would users like; how aware are users of the source of subject terms in the catalog? A questionnaire (absent from the article) was administered to a sample of eighty-one student surveying their use of subject searching. Then they were shown a slide-tape presentation, demonstrating the principles of subject searching and use of LCSH and asked to evaluate its usefulness.

Early studies of card catalog use led to the theory that subject access was of relatively little value to users, but more recent studies of online catalogs revealed a radical change. This research found subject searching and title searching were
well used, especially by those who were frequent catalog users. Graduate students made least use of subject searching. Very few users assumed that a zero result meant that there were no relevant materials in the library and most searchers persevered by trying an author or title search or asking a librarian.

In terms of the type of enhancements they would prefer to see, term combination, contents lists, and a list of subject terms were regarded as equally desirable. Those who do not do subject searching said that they found what they needed with author or title searches, and less than half knew that the only subject terms available came from LCSH.

A parallel survey (10) of faculty use of the same catalog compared 112 humanities and social science faculty members with eighty-five natural sciences and engineering faculty. A brief questionnaire was designed to examine the use of the subject heading search in both the card and online catalog; ascertain sources for catalog subject searching; ascertain sources for subject terms used to search the catalog; and ascertain preferences for catalog enhancements to improve subject access.

This methodology relied on users' recollections of their catalog use, which may be unreliable, and very low response rates from both faculty groups (43 percent and 41 percent, respectively) make the findings questionable. The majority of the faculty surveyed indicated that they came to the library at least once a week. The study revealed that almost all of them used the online catalog—very similar to the CLR national survey (20)—and also the card catalog. (At the time of the survey retrospective conversion had not been completed.) About half of them claimed to use the online catalog either “frequently” or “every visit.” Overall, about 90 percent did subject searching to some extent in one of the two catalogs, although few did it “always” or “frequently” in the online catalog, despite the fact that frequent use of the online catalog was higher than the card catalog. Science/engineering faculty were more likely to search by subject “always” or “frequently” than the humanities/social science group.

Almost half of the faculty indicated that they used the subject search to keep current with publications in their specialization, and almost as many for “familiarization with materials in my discipline, but outside my current area of specialization.” An interest in interdisciplinary research was expressed by twice as many in the humanities group as in the science group.

An analysis of the source of terms used for subject searching showed that the majority of users just dreamed up terms, or tried terms known from other reference sources or from subject headings on the catalog entry for a known item. Use of LCSH was very low, and some users did not realize there was any difference between keywords and subject headings. Preferred enhancements were the ability to combine subject terms and view related terms and inclusion of contents information. The two groups differed over the need for methods of limiting or expanding a search, with the humanities group interested in expansion and the scientists in limiting. Nonuse of subject searching appeared to be related to a preference for journals rather than monographic materials.

It suggested that faculty are more interested in the library’s resources than in the access tools, and that further investigations should include faculty use of other search tools, including online and printed indexes to the journal literature. Since a number of these findings run counter to general assumptions in the field, they require substantiation in the form of replication studies before being accepted, particularly in view of the nature of the sample.

**ACQUISITIONS**

Two studies of acquisitions merit attention, one because it attempts to gather basic information that could be used in developing policy and practice and the
other because of its somewhat unusual methodology, which might be adapted by other researchers. A survey conducted by Schmidt (29) investigated the organizational structure and processes involved in acquisitions work, the level of professional and nonprofessional involvement in acquisitions tasks, and the salary levels of acquisitions librarians. Questionnaires were sent to acquisitions librarians in ARL libraries, and the return rate was an impressive 91 percent. Analysis of the data details the organizational structure of acquisitions work, comparing the division of labor in separate serial and monographic acquisitions departments with integrated departments. Division of labor by function (ordering, claiming, and receipt) presented problems for many librarians, but most could categorize tasks regularly handled by professionals and nonprofessionals. A comparison of staffing at the ten largest and ten smallest research libraries revealed surprisingly little difference, except for expenditures. Schmidt concludes that a critical mass in acquisitions staffing size developed in large academic libraries. She proposes an equation for increases in staff size as a function of increases in acquisitions budget. She points out that professionals appear to be handling nonprofessional work in a significant number of libraries and that segregated units appear to have a lower ratio of professional to nonprofessional staff than integrated units. Further analysis of the process emphasizing the role of the professional is recommended.

Most vendor performance studies are conducted in one library using similar groups of titles. Recently, two libraries cooperated in a study of vendor performance reported by Miller and Niemeier (21). By ordering the same titles at the same time from different vendors and monitoring the delivery time, discount, fulfillment rate, and level of service, a close comparison of the vendors was made possible. Each vendor received all types of subjects, prices, and publishers. The analysis is illustrated by tables, charts, and graphs. The findings indicate that one vendor ranked highest in all areas of service measured. The authors point out that this was a limited study, and the data can be used only for comparative purposes, but it provides a useful methodology for comparing vendor performance.

**LIBRARY PRESERVATION**

The costs of preservation microfilming at four large research libraries were studied over a six-month period to identify and analyze the tasks each library accomplished most efficiently. Kantor (14) breaks down the preservation microfilming operation into eight components: the decision to microfilm, physical preparation of the book for filming, record keeping, preparation of targets, filming, processing of film, quality control checks of the film, and administrative support. Four methods of data collection were used: work sampling, time logs, error analysis, and solicitation of statistical data from the individual libraries. In work sampling, an observer looks at a work area on a random schedule and notes what each worker is doing. Over a period of time a profile of each workers’ tasks is compiled based upon the random observations. By combining all the profiles, a picture of the proportion of time spent by all workers on each task can be developed and, by applying workers’ salaries to the profiles, a cost profile for each task is developed. Time logs were used to estimate the cost of each item produced. Workers noted the number of items completed each day and the amount of time spent to complete each one. Data on errors in filming (such as pages missed, etc.) were collected on standard forms, and the amount of time spent recording the error was noted. Productivity data supplied by each library was used to estimate the relative magnitude of activities the researchers could not quantify by work sampling. Samples of the forms illustrate how data were collected and the analysis process. The library that was most efficient at each of the component operations was identified and explanations given. The author recommends a high-volume processing center be set up where a pool of skilled workers; economies of scale in purchasing, record-keeping, and administration; and investment in new technology will result in
lower preservation microfilming costs. This study provides a useful methodology and breakdown of tasks for the analysis of preservation microfilming operations.

In preparation for a preservation project at Syracuse University, a survey of the condition of books and bound periodicals was undertaken (3) to identify the types of preservation problems likely to be encountered and to estimate the percent of the collection affected. A stratified sample from each of the collections was developed and a machine-readable questionnaire to assess the condition of each item was designed. A pilot study conducted by library staff was undertaken to test and adjust the questionnaire and data were analyzed using the SAS statistical package. The full study was conducted by work-study students and the results presented in tables and text. A listing of the survey questions and a reproduction of the machine-readable document are given. Appendices on sample size determination and statistical analysis are also included.

The decision to stop binding monographic paperbacks led Presley and Landram (24) to explore the effects of circulating unbound paperback books. They developed a set of hypotheses about the condition of these books after one year of circulation. A random sample of paperbacks acquired over a three-month period was selected and examined every other month for a year to determine the condition of individual titles. An evaluation form identifying each book with information about its condition was filled out during each examination. A copy of the evaluation form is appended. The findings supported a decision to stop binding. After a year on the shelves, 71 percent of the books were undamaged. Of the damaged books, 60 percent circulated and 40 percent had not. The authors suggest that interested libraries replicate the study to determine the effects of such a decision.

OVERVIEW

Technological developments are providing new areas for research and increased opportunities for data collection and manipulation, testing, and analysis. Nevertheless, the research reported this year continues to make use of a limited range of methodologies. There is little "pure" research, possibly because librarianship is an applied profession. Survey and observation remain the most popular methods for data collection, probably because of financial limitations and sampling problems. Statistical analysis is still most commonly elementary, and methodologies are often not sufficiently rigorous. Most of the studies are applied research, conducted by library practitioners in their own libraries. Their concern is with practicalities—the "what" and "how" of library operations, and provision of information for management decision making. The experimental studies, conducted at major institutions responsible for the production of large bibliographic databases (OCLC, RLIN, NLM), are developmental and long range. Perhaps this is not so surprising, when one considers the commitment of resources required for this type of investigation. Such studies require the availability of a large file of data as well as hardware and software processing capabilities. Their results will provide information needed to design more efficient and economical systems in the future.

Although some practitioner studies resulted in procedural changes based on the research findings, experimental work currently in progress seems far from implementation. Such time lags are a feature of our field, and, perhaps, inevitable. Product development is a slow process, so we must wait patiently for the emergence of tomorrow's practice from today's research.

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**ARL MEETING FOCUSES ON COLLECTION ISSUES**

The 113th Membership Meeting of the Association of Research Libraries (ARL) was held in York, England, September 19–22, 1988. The meeting was in conjunction with the Standing Conference on National and University Libraries (SCONUL), the British equivalent of ARL, and convened on the campus of York University.

The ARL/SCONUL meeting provided a unique opportunity for the directors of a number of the world’s major research libraries to consider the issues facing these libraries from new perspectives. The theme of the meeting was *Collections: Their Development, Management, Preservation, and Sharing*, and the format was designed to encourage international comparisons of practices and problems.

Presiding at the meeting were Elaine F. Sloan, vice-president and university librarian at Columbia University and president of ARL, and Nance McAulay, librarian at Durham University and chair of SCONUL. Jaroslav Pelikan, professor of history at Yale University, and A. J. Forty, principal and vice chancellor of Stirling University in Scotland, delivered keynote addresses. Lord Quinton, chairman of the British Library Board, spoke at the official dinner.
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This article describes the application of the Dewey Decimal Classification "phoenix" for data processing, computer science, and computer engineering (004–006) to a selection of materials classified according to older schedules in a Boston-area public library. The revised schedules were easy to learn and to apply, even for the novice user, and the browsability of the set of materials in the study was improved through reclassification.

This article focuses on a recent update of a particular portion of the Dewey Decimal Classification (DDC) schedules pertaining to data processing, computer science, and computer engineering. Published in 1985, the 004–006 Data Processing and Computer Science and Changes in Related Disciplines "phoenix" revision of DDC edition nineteen is a working replacement schedule. The revision appeared in response to demand from DDC users, and the decimal classification division cites four major reasons for the urgency that accompanied its publication. First, certain "new" topics, such as artificial intelligence, were poorly placed in relation to other computer science topics. Nonelectronic data processing, now an "old" area, still occupied disproportionate space in the schedules. There was insufficient provision for a number of subjects currently of growing interest—one critical example being microcomputers. Ultimately, the Dewey classification schedules simply failed to provide enough room for the present expansion of data processing and computer science materials.

The publication, 004–006... Changes, reflects a relatively recent policy of continuous revision that, according to the foreword, "will eliminate long delays between completion of revisions and expansions and their application [and] also enable the library community to absorb smaller amounts of revision over a longer period of time since DDC editions will appear less frequently."

The publication consists of four parts: the expanded schedules, an index

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to the new numbers, a manual of application, and a glossary to computer terminology (deemed necessary and of value to librarians since this terminology is still in flux). Basically, the former classification of 001.6 (Data Processing under Knowledge) is replaced by the sequence of “Generalities” 004, 005, 006, with specific subdivisions delineated. Materials on computer engineering are moved from the applied science designation 621.38195 (Computers under Applied Physics, Electromagnetic Engineering) to 621.39, a class number appropriated for the purpose, with further subdivisions patterned after those in the 004 and 006 classes. Scope notes and instructions are provided in the schedules themselves and also in the useful manual of application.

Published response and criticism relating to this DDC revision are rather scarce in the literature. So, as someone interested in the cataloging of computer-related materials, I chose to examine and evaluate the changes in 004-006 ... Changes by applying them to an existing public library collection. I selected a medium-sized public library in the Boston area that exhibits a variety of old classification approaches to a volume and variety of materials sufficient to make a reclassification exercise both interesting and worthwhile. This exercise was designed to address two major questions: How easy to learn and use are the 004-006 revisions? How would the resulting arrangement of materials compare to that which currently exists?

First, I searched the card catalog and retrieved titles and call numbers for materials cataloged under subject headings beginning with “COMPUTER” or “COMPUTERS” and titles beginning with those words, selecting works dealing with computers and data processing primarily rather than as secondary subjects or in relation to other subjects. This search yielded 157 items scattered throughout a variety of locations in the nonfiction and reference shelves. Based on experience working with various types of computers and software, and background gained from reading the periodical literature in these areas over the past five years, I selected twenty books that, in my judgment, represented the library’s holdings in order to illustrate the process and results of classification under the revised 004-006 schedules.

Although my experience with this sample cannot be generalized to other computer-related materials, or even to the remainder of the library’s collection, the experiment highlights the process of using 004-006 ... Changes, as well as some of its strengths and possible weaknesses. It also facilitates comparison of the new class locations with the library’s previously used classification schemes and policies.

The twenty sample items discussed below are arranged alphabetically by author. Following the portion of the paper relating to classification of the individual materials, table 1 summarizes “before” and “after” locations.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>651</td>
<td>Benton, Charles J. <em>The Data Base Guide: How to Select, Organize, and Implement Data Base Systems For Microcomputers</em>. Robert J. Brady, 1984.</td>
<td>005.74</td>
</tr>
</tbody>
</table>
In the library used as the setting for this exercise, many items are classed broadly at 651, the applied sciences number for office services, which in DDC edition nineteen (and prior editions) includes the recording, arrangement, transmission, storage, and retrieval of information; office communications; and equipment used for these purposes. The number 651.8 signifies data processing as used in performing such functions, but it is not employed for any computer-related material in this library. It seems as though considerable difficulties and ambiguities were inherent in classifying books on microcomputers before the advent of the revised schedules. This library has been inconsistent in its practices, so that the majority of such materials now appear to be randomly divided between 651 and 001.64.

At 005.3 in the revised schedules we find “Programs,” including such key terms as software: its critical appraisal, selection, and use; application programs; and software documentation. Instructions direct the cataloger to “class programs for a specific application in computer science with the application in 005–006.” Pursuing this, one encounters the numbers 005.7, “Data in computer systems,” and 005.74, “Data files and databases.” There is no opportunity for subdivision by type of computer in 005.74, and the manual of application tells us to place here computer-science aspects of databases—that is, the narrowly technical issues of designing, programming, and installing databases and database management systems—the kinds of things that system designers and programmers need to know but that users generally do not need to know unless they are installing a database on their own computer. [Emphasis added.]

The schedules and manual of application underestimate the extent to which many microcomputer users are now participating in the “narrowly technical issues” of choosing, designing, installing, and managing databases. The increased memory and storage capacity of the hardware has enabled more powerful and complex software to be utilized in this area, so databases are no longer confined to larger mainframe computers. The number 005.74 can rightly be assigned to this book; a question to consider is whether the schedules should offer the possibility of subdividing the “data files and databases” area by type of computer.

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<tr>
<td>001.64</td>
<td>Brod, Craig. <em>Technostress: The Human Cost of the Computer Revolution</em>. Addison-Wesley, 1984.</td>
<td>004.019</td>
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In the prefatory material, this author defines “technostress” as the disease that results when a critical psychological balance between people and

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computers is violated. In the revised classification scheme, the number 004.019 bears the note, "Class here psychological principles and human factors in data processing and computer science." This coextensive classification is an improvement over the library’s current practice of placing this relatively unusual book in the same broad location as the other hardware and software materials, 001.64.

The technical/engineering treatment of computer hardware is moved by the revised schedules from 621.38195 to 621.39. We are instructed to "class here electronic digital computers, central processing units, computer reliability, [and] general computer performance evaluation." There are more explicit extended notations for specific types of computers, such as digital supercomputers, mainframes, and microcomputers, but this book was written before all of these distinctions had been drawn and does not make reference to any particular computers. It includes some treatment of software, which is excluded from 621.39 in the manual of application, but it primarily focuses on hardware. (This book was selected for the sample due to its subject coverage, but it is considerably out-of-date and many librarians might choose simply to weed it rather than reclassify it.)

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The classification 004.6 denotes "Interfacing and communications," including "equipment and techniques linking computers to peripheral devices or to other computers." The programming and data aspects of interfacing and communications are classed at 005.71. These areas will need further expansion, perhaps beginning with the separation of the two components, interfacing and communications. Russell Sweeney suggests that the revisions in 004–006. . . Changes exhibit more prominent use of the word "Networks" than only as a "see" reference in the index.

The number 004.61, "Interfacing and communications for specific types of electronic computers," is supplemented by the appropriate number (6) to indicate digital microcomputers, which are, indeed, the subject of this book, although this is not immediately evident from the title.

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<tr>
<td>651</td>
<td>Ciarcia, Steve. <em>Build Your Own Z80 Computer</em>. Byte, 1981</td>
<td>621.39165</td>
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This book on the engineering aspects of computers deals with a specific type—those built around the Z80 microprocessor. The manual of application points out in tabular form that "621.39 parallels 004 in structure, except for 621.399, which is analogous to 006." Thus, the specific digital microcomputer subdivision 165 is added to 621.39 to form the revised class number. Software is only a minor topic in this book, allowing for classification at 621.39165 by subject predominance.
In the preface to this book, we are asked to identify with the person who buys an IBM PC and learns to use and program it for all of the typical applications. The author suggests that one may then start to wonder whether it is possible to control appliances, heating, or security systems with the computer. The answer is yes, and the book goes on to provide information on connections to peripheral devices that enable one’s computer to “interface with the outside world.” The classification number used for Chandler’s *Dialing for Data* above is enhanced with an additional digit (5) to indicate a specific type of microcomputer.

A note in the 004 schedules instructs that materials on word processing be classified at 652.5. The number 652 denotes “Processing of written communication” in the DDC schedules; 652.3 is used for typing, a precursor to word processing. This book will not be collocated on the shelves with other materials on computers and their applications. A question to consider: Should classification of word processing and the associated software be provided for within the 004–006 schedules?

This book covers basic introductory concepts, offers buying guidance, and discusses educational and personal uses of computers. A scope note under 004 mentions that works dealing primarily with computer-assisted instruction are classed at 371.39445, but the scope of this book is too broad for that number to apply. The broad class number for digital microcomputers, 004.16, is the best alternative for this book. The 004–006 schedules (or DDC subdivisions) do not provide a way to reflect the perspective of parents or children specifically in a digital microcomputer class number. For that, the library would have to rely on subject index access through the use of a subject heading such as “Computers and children.”
The 005 class covers computer programming, programs, and data, including both software and firmware and their development. General concepts relating to programs for digital microcomputers, including critical appraisal, selection, and use, are indicated by 005.36, to which we are instructed to add the appropriate number following 005.32 in 005.322–005.329. This results in 005.365 for critical appraisal and selection of software for the family of microcomputers indicated in this title. A note in the manual of application at 004.11–004.16 allows one to group the IBM PC and its compatibles as a single type for classification purposes.

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The 005 schedules may leave some finer distinctions to be desired, but for this title, the straightforward, general number 005.12 fits, since the subdivision 12 simply adds "Program design" to the base 005 (Computer programming, programs, data). The book does not address specific languages or types of computers; rather, it focuses on user interaction with custom-designed software and considerations for the programmer in designing input routines.

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The preface to this reference book informs the reader that terms relating to both hardware and software are included, with software concepts particularly emphasized. The manual of application in 004–006... *Changes* tells us to "class in 004 works on computer hardware and works treating both computer hardware and the "soft" aspects of computer systems." The schedules provide 004.16 for digital microcomputers, to which was added the standard subdivision 03 to show that this is a dictionary.

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<td>McWilliams, Peter. <em>Peter McWilliams’ Personal Computer Buying Guide</em>. Doubleday, 1985.</td>
<td>004.16029</td>
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</table>

Digital microcomputers, as noted above, are classed at 004.16 by the revised schedules. While performance evaluation in the strict sense of the term is classed at 004.24, the manual of application tells us to "add s.s. 029 to the general works number if the emphasis is on evaluation as a consideration in purchasing, e.g., buyers’ guides to microcomputers 004.16029." The fact that this book also discusses software is compatible with this classification.
This book is similar to the Ciarcia book discussed earlier, Build Your Own Z80 Computer, in that both deal with a specific microprocessor. This primer contains some technical description of the chip; however, it is intended for the novice, and it also explains how software commands are channeled through the microprocessor. The manual of application quelled my initial temptation to classify this title at 621.39, in an explanatory note captioned ‘‘004–006 vs. 621.39.’’ The distinctions here offer guidance if one is confronted in practice by borderline materials:

Works classed in 004–006 treat (a) computer hardware from the user's viewpoint and/or (b) software or firmware. Works classed in 621.39 (a) treat computer hardware solely from the viewpoint of engineering or manufacturing and (b) do not treat software or the program aspect of firmware. . . . Comprehensive works on the computer science and computer engineering aspects of a subject are classed in 004–006. 14

Hence, the specific digital microcomputer class number 004.165 is assigned.

The first half of this book consists of a general introduction to computer-graphics terms, design, and varieties, while the second half provides examples of how to create these graphics using popular software packages. Because the first portion occupies so much space and seems to represent the intent of the work, I cannot justify the specific classification 006.686, graphics programs for digital microcomputers. The concepts treated in this book could be applied with different types of computers. Therefore, the class number 006.6 for computer graphics in general is selected.

The preface of this comprehensive reference book indicates that it contains terms related directly or indirectly to usage of hardware and software, including the categories of computers, data processing, distributed data processing, home computers, programming languages, telecommu-

Existing
Class No. 001.64

Revised
Class No. 004.165

006.6

004.03

004.16

004.165

006.6
ninations, and word processing. Under the 004 class, a scope note tells us to "class here selection and use of computer hardware; comprehensive works on hardware and programs in electronic data processing." Thus, I chose the number 004 and added the standard subdivision 03 to indicate the dictionary format.

This book is similar to Goldberg's *Microcomputers: A Parent's Guide*, and the two were published only one year apart. Yet they had been classified differently (with the Goldberg title at 651), for no apparent reason. This book devotes more attention to microcomputer software than does Goldberg's, but the class 005 is to be used for works dealing primarily with software, programming, and data. This book will be assigned the same classification number as *Microcomputers: A Parent's Guide*, an example of enhanced collocation through application of the revised schedules.

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Having entered the realm of "Data in computer systems" at 005.7, we progress to "Relational databases" at 005.756 and "Specific relational database management systems" at 005.7565. The instructions in the schedules direct us to "arrange alphabetically by name of database management system, e.g., dBASE II." This degree of specificity is coextensive with the book, but note that the materials on database software packages (a microcomputer approach to database management) are separated in the schedules from the other applications programs and software documentation located in 005.3, without the option provided there of subdivision by specific type of computer.

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"Peripherals" are classed at 004.7. This is the most specific classification possible for this title, since terminals are input/output devices and printers are output devices: the schedules provide the subdivision 75 for "Peripherals combining input and output functions," 76 for "Input peripherals," and 77 for "Output peripherals."

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This book is a guide to using prewritten programs for microcomputers in a small, computer-based business. It does not teach original programming, the topic of the 005.2 class. The best classification afforded by the schedules is 005.36, "Programs for digital microcomputers." I could not find a way to reflect the profit-oriented slant of this item in the class number.

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The 006 class is devoted to "Special computer methods," including artificial intelligence, pattern recognition, computer sound synthesis, and, at 006.6, computer graphics. Under 006.67, "Programming for specific types of computers," we are instructed to add the appropriate subdivision from the 004.11-004.19 schedules, producing 006.6765 for a specific type of digital microcomputer, in this case, the Apple.

BEFORE AND AFTER SHELF LOCATIONS

Table 1 shows the before and after classifications of all books in the sample, allowing for a complete comparison of the shelf locations. Eleven books were shifted from prior classification at 001.64 to the 004-006 classes. Six books were reclassified from the 600s to the 004-006 area, while three books were moved within the 600s. Thus, the result is a total of seventeen books now located in the 004-006 classes on the shelves and three books cataloged in the 600s. Before reclassification, nine of these items were located in the 600s and eleven were shelved at 001.64xx.

TABLE 1

<table>
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<td>621.39165</td>
</tr>
<tr>
<td>Coffron, James. <em>The IBM PC Connection.</em></td>
<td>001.64</td>
<td>004.6165</td>
</tr>
<tr>
<td>Foster, Timothy R. V. <em>Word Processing For Executives and Professionals.</em></td>
<td>651</td>
<td>652.5</td>
</tr>
<tr>
<td>Goldberg, Kenneth P. <em>Microcomputers: A Parent's Guide.</em></td>
<td>651</td>
<td>004.16</td>
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TABLE 1 Continued

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<th>Revised Class No.</th>
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<tr>
<td>Good, Philip I. <em>A Critic’s Guide to Software for the IBM-PC and PC-Compatible Computers.</em></td>
<td>651</td>
<td>005.365</td>
</tr>
<tr>
<td>Heckel, Paul. <em>The Elements of Friendly Software Design.</em></td>
<td>001.6425</td>
<td>005.12</td>
</tr>
<tr>
<td>Hordeski, M. <em>Illustrated Dictionary of Microcomputer Terminology.</em></td>
<td>651</td>
<td>004.1603</td>
</tr>
<tr>
<td>McWilliams, Peter. <em>Peter McWilliams’ Personal Computer Buying Guide.</em></td>
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<td>004.16029</td>
</tr>
<tr>
<td>Morgan, Christopher L. <em>8086/8088 16-Bit Microprocessor Primer.</em></td>
<td>001.64</td>
<td>004.165</td>
</tr>
<tr>
<td>Prague, Cary. <em>Getting Great Graphics.</em></td>
<td>001.64</td>
<td>006.6</td>
</tr>
<tr>
<td>Rosenberg, J. <em>Dictionary of Computers, Data Processing and Telecommunications.</em></td>
<td>651</td>
<td>004.03</td>
</tr>
<tr>
<td>Stone, M. David. <em>The Parents’ Computer Book.</em></td>
<td>001.64</td>
<td>004.16</td>
</tr>
<tr>
<td>Townsend, Carl. <em>Using dBASE II.</em></td>
<td>001.64</td>
<td>005.7565</td>
</tr>
<tr>
<td>Webster, Tony. <em>Terminals and Printers Buyer’s Guide.</em></td>
<td>001.64</td>
<td>004.7</td>
</tr>
<tr>
<td>Zboray, Richard. <em>Programs for Profit: How to Really Make Money With a Personal Computer.</em></td>
<td>001.64</td>
<td>005.36</td>
</tr>
<tr>
<td>Zuanich, Margaret Ann. <em>Basic Fun With Graphics: The Apple Computer Way.</em></td>
<td>001.64</td>
<td>006.6765</td>
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</table>

CONCLUSION

The experiment described in this article asked two questions, one regarding ease of use of the revisions in 004–006. **Changes** and the other relating to how reclassification under these schedules would affect the shelf arrangement of twenty sample items in a public library collection. My answer to the first question is that the revised schedules proved to be a hospitable document, very easy to learn and to use, even for a DDC novice. The twenty items relating to data processing, computer science, and computer engineering were classified quite readily under the 004–006 revised schedules, and, compared with prior cataloging, the resulting arrangement is characterized by relatively consistent, logical distinctions between subjects and enhanced collocation of materials dealing with the same or similar subjects. Thus, the browsability of this set of public library materials was improved through reclassification.

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Operation Cleanup: The Problem Resolution Phase of a Retrospective Conversion Project

Amy Hart

The problem resolution phase of a retrospective conversion project for monographic records at the University of Massachusetts–Amherst is examined. Knowledge needed by the problem-solving librarian is discussed, and the kinds of problems encountered are categorized and described. Difficulties involved in standardizing the editing process for problem records are noted, and suggestions for developing editing guidelines are offered.

It often comes toward the end of a retrospective conversion project, and it deals with a relatively small portion of the total records processed, but the problem resolution phase of a retrospective conversion project must be handled as carefully as any other phase. This article analyzes the task of problem resolution for bibliographic records for monographs in a retrospective conversion project at the University of Massachusetts–Amherst. The observations made here can prove helpful to other libraries involved in planning and implementing retrospective conversion projects.

In addition to the financial reasons for planning the problem resolution phase noted by Carter and Bruntjen, there are compelling qualitative reasons for careful planning. It is generally agreed that full MARC records are the desirable standard for retrospective conversion of a bibliographic file. However, if no guidelines are set down to govern the kind of editing that can be done to the MARC records, the fullness of the records may be for nought. The integrity of the database depends, in part, on standardization of the editing process. In spite of this, little has been written on the specifics of editing in retrospective conversion. Kruger notes the gap in coverage in the literature for the years 1980–1983. A perusal of titles abstracted in Library and Information Science Abstracts for January 1984 through May 1987 suggests a similar situation.

Many editing decisions are implemented during earlier phases of a project, when more or less straightforward matches are found between a library’s manual records and corresponding machine-readable records.

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These decisions should be documented so that they may be applied during the problem-solving phase. However, by their very nature, problem records are more complicated to match. It should be expected that further editing decisions will need to be made.

The University Library at the University of Massachusetts is involved in a retrospective conversion project utilizing OCLC’s RETROCON service. Those shelflist cards for which OCLC does not find an acceptable match on the Online Union Catalog (OLUC) are flagged as problem records and returned to the library unconverted. Usually there is a discrepancy between what the shelflist card says and what the online record says. Less frequently, cards are sent back because they lack one or more essential elements of the bibliographic description. All of these records are the subject matter of the problem resolution phase of retrospective conversion.

Solving problems in a retrospective conversion project is both an intriguing and a frustrating job. The routines of cataloging are, to an extent, put in abeyance, and one exists in a kind of no man’s land of retrospective conversion. There is more freedom than is usually encountered in a cataloging department, but it is frustrating because there is no authority to turn to for answers.

Retrospective conversion problem solving requires a historical as well as a current knowledge of cataloging policy. Librarians who earned their M.L.S. since the adoption of AACR2 need to take a crash course in cataloging history to understand the format of some of the records they will encounter. This knowledge is especially important for problems concerning imprint dates, but it is helpful in many other cases as well.

Retrospective conversion also requires knowledge of institution-specific cataloging policies. This should be an important factor in deciding who should do the actual problem solving. If the library decides to hire someone from the outside, it must plan on providing a thorough training period.

Although retrospective conversion work requires familiarity with current cataloging practice, it is not current cataloging and should not be treated as such. Nevertheless, solutions for particular problems must be compatible with existing rules and policies, especially when new cards or new records are being created. The university, as a member of Five Colleges, is committed to the cooperative development of a five-college online public access catalog. Therefore, the University Library also had to consider the needs of the Five College catalog system when choosing solutions for retrospective conversion problems.

Because the purpose of retrospective conversion at the University Library is to create machine-readable records appropriate for loading into LS/2000, the solution to each problem must be evaluated in terms of its appropriateness not only for OCLC but also in terms of its appropriateness for LS/2000. Knowing what is and is not possible on LS/2000 helps to define and limit the options available for solving problems. LS/2000’s greater indexing abilities offer more freedom in editing than does OCLC’s cataloging subsystem. For example, at the University Library all series, regardless of their indicator values in the MARC record, are indexed in
LS/2000. If an OCLC record has a series statement coded as a series traced differently, both forms of series (490 and 8xx) will be indexed in LS/2000. Therefore, even if the traced series statement on our shelflist card matches that in the 490 field, there is no need to edit the series fields on the OCLC record.

**CATEGORIES OF PROBLEMS**

Problems in retrospective conversion can be categorized in different ways. The simplest approach is to divide problems by the elements of the bibliographic description (i.e., title problem, edition conflict, publisher conflict). Alternatively, problems can be categorized according to the types of cards on which they appear. At the university these include LibCat cards (produced in earlier years by an in-house automated cataloging system), LC printed cards, revised LC cards, and hand-typed cards. A third method is to categorize by the causes of the problems (e.g., incomplete bibliographic information given, typographical error, and incomplete revision of copy used to create cards).

In practice it is more useful to combine the methods and to categorize problems according to which occur most frequently and which are most difficult to resolve. Categorizing in this manner means that the categories are not mutually exclusive and that there can be cards with problems fitting into several categories (e.g., there could be a date conflict on a revised LC card or an edition conflict caused by a typographical error on a hand-typed card).

At the University Library problems are put into the following categories:

1. **Dates Conflicts.** These are possibly the most numerous type of problem and are definitely the most complex encountered in problem solving. Knowing past cataloging rules and Library of Congress cataloging practice is crucial because there have been many changes in policy over the years. At one time, dates from a title page of a book were the accepted publication date, and a date on the verso of the title page was of secondary importance. Today, the Library of Congress might ignore a date on the title page in favor of a date on the verso. Its policy is to try to ensure that the date used in cataloging is, in fact, the first date of publication and not simply a printing date. This policy is evidenced in the Library of Congress' rule interpretation as much as it is in rule changes, because since AACR (with its provisions for issues of an edition), the first date of publication is the preferred date for cataloging. To further complicate matters, it seems that practice has not always followed theory. In some cases, two separate records were created for two separate printings of a work. Today, the Library of Congress' policy, if not always its practice, is to create one record, using the first date of publication (provided it is given).

This wreaks havoc on retrospective conversion. It means you cannot assume a no-hit/create-a-new-record situation when an initial search on OCLC reveals no online record with a date that matches your shelflist card. Instead, you should go the stacks, retrieve the book, and see what publication information is given in it. It is possi-
ble, and even likely, that with this new information, and using current cataloging rules, an online record to which your book can and should be matched will exist.

2. **Edition Statement Conflicts.** These seem to rank second in frequency and complexity. They have two main causes. The simpler is human error and occurs with typographical errors on hand-typed cards or with less-than-thorough revision of an edited LC card or copy used to create cards. The second cause involves the conflict of written cataloging policy versus what publishers provide as date and edition information in their books. **AACR2** is frustratingly simplistic in its treatment of the edition area. LC’s *Cataloging Service Bulletin* and OCLC’s *Bibliographic Input Standards* are more specific but not necessarily more helpful. Too often there is no exact match between how the edition information is presented in the book and the examples given in **AACR2** or the other cataloging reference tools. One is left trying to fit what the book says into one of the examples and knowing it cannot be done.

3. **Problems with Reprint Editions.** These are essentially problems of definition and, as such, are similar to edition problems. Confusion arises because publishers often denote subsequent printings with the phrase “Reprinted [date].” In the past, the University Library has recorded this information on its catalog cards, even when the item is really a subsequent printing. Thus, notes on the library’s shelflist cards that state “Reprinted [date]” or “Reprint of ___ edition” are ambiguous, and one cannot be certain whether the card represents a reprint edition or simply a subsequent printing. OCLC returns the card as a problem, requesting further bibliographic information. The book must be consulted to determine what printing information is given in it. If the book is a subsequent printing, the reprint problem becomes a date problem. With reprint editions, the shelflist card and the online record may be in conflict with regard to which information (original or republication) is brought out in the description and which is given in the notes area. **AACR** emphasized the original edition information by putting it in the description and giving the reprint information in a note. **AACR2** puts the reprint information in the description and puts information about the original edition in the notes area. Resolving these problems requires that a decision be made on whether the two records must be edited to match each other exactly.

4. **Problems with On-Demand Photocopies of Monographs and Theses.** Closely allied to the problem of reprint editions is the problem of on-demand photocopies. Although both reprint editions and on-demand copies are types of republications, they are cataloged differently. **AACR2** attempted (in Rule 1.11A) to treat these forms similarly. The Library of Congress’ decision to treat photocopies and microforms as they had been treated under **AACR** continued the differentiation.

Problems with on-demand photocopies are almost invariably returned because of incomplete bibliographic data on the shelflist card; most often the type of republication, the publisher, or date of republication is lacking. A high proportion of these problems requires the
creation of a new record. OCLC dictates that a new record for a photocopy be made even if a record exists for the original publication or for a microform version.

5. **Incomplete Revision of Edited LC Cards or Copy.** Like many libraries, the University Library used LC printed cards for similar versions of a book and edited the cards to match its version. Sometimes not all the conflicting information was crossed out and/or not all the correct information was added. Data left in or out created conflicts between the book and the shelflist card and, in retrospective conversion, between the shelflist card and the correctly matching OCLC record for the book. The same situation occurred when copy for another version of a book was used to create cards through the LibCat system. If misleading information was left on the copy, or if correct information was not added, the resulting cards were incorrect. Common points of discrepancy between the edited cards and the books are edition statements, dates of publication, physical descriptions, series statements, and bibliography or index notes.

6. **Typographical Errors in Hand-Typed or LIBCAT Cards and Other Miscellanea.** These were originally grouped as two categories, but because so many miscellaneous problems turn out to be typographical errors, they have since been grouped together.

The most frequent miscellaneous problems are collation and publisher conflicts. The majority of collation conflicts turn out to be typographical errors on the part of either the University Library or the inputting institution. A second kind of collation problem occurs when the library has described an item in volumes and the online record describes it in pages, or vice versa. A related problem occurs when the library describes a work as "1 volume (variously paged)," and the online record gives a specific number of pages, or vice versa.

Publisher conflicts are most often caused by a different choice of name or by a different choice of publisher if two or more entities are named on the title page and it is not clear which is the publisher. Foreign-language materials often have publisher conflicts. Another source of conflict is when a subsidiary of a larger publisher is named along with its parent company in a book; one publisher may be named on the shelflist card and the other on the online record.

The most frequently caught typographical errors in retrospective conversion are those in the main entry and title areas. It is necessary to consult the book, and sometimes the National Union Catalog or other cataloging sources, to determine which information is correct. If the card is wrong, consideration is given as to whether cards in the existing catalog need to be replaced or if correction for the future system is sufficient. If the online record is wrong, the library must decide if an error report will be filed with OCLC or if local editing of the record is more appropriate.

7. **Independently Published Items Bound Together Locally.** These problems can be divided into two groups: those for which separate catalog records were created for each item bound with the others and those
for which a collective catalog entry was made.

For those with separate catalog records, the main problem was that the records lacked bound-with notes. OCLC discovers this problem only when the matching OLUC record contains a bound-with note. They return the shelflist card as a problem. The library discovers instances of this serendipitously: OCLC flags the card for some other problem, and, upon retrieving the item, the library discovers it is bound with other titles.

Bound-with items represented by collective catalog entries in the catalog present different problems. OCLC is usually unable to convert these items and most come back as problems. Decisions must be made as to what kind of cataloging is desired for these items. Chances are slim that a collective entry record will exist online for the entire item, but the probability is higher that one or more of the individual items has an individual online record. The library must decide whether these individual records will be used (and original cataloging done for those items not represented in OCLC) or if a collective catalog record will be prepared for input on OCLC. Either alternative is time-consuming and difficult.

To further complicate matters, all separately cataloged items bound with other items will cause problems for the status function of the LS/2000 circulation subsystem. Individual item records for each title need to be linked somehow so that if the item is checked out, the status for all of the item records will change from available to unavailable.

Because of the problem with circulation status, the University Library has decided to wait until the linking stage of retrospective conversion before adding bound-with notes to problem records that lack them.

Cataloging the problems encountered in a retrospective conversion project is useful because it gives the problem-solving librarian an idea of what to expect and because, in the categorizing process, the range of problems within a category will be identified.

**STANDARDIZING THE SOLUTIONS**

Categorization of the problems will not, on its own, lead to standardization of their solutions. Within a category, the solution chosen for a particular problem will depend on the unique combination of factors surrounding it. These factors include how many online records are possible matches for the problem shelflist card; how complete, current, or otherwise acceptable any of these records is; and what kind of bibliographic information can be gleaned from the book itself. Because of these factors, solutions cannot be standardized through simple first-level categorization, or even subcategorization, of the types of problems. There are too many independent variables.

General guidelines are needed on the kind of editing of an online record permissible in the problem resolution phase of a retrospective conversion.
project. These guidelines, when applied to problems in a particular category, will lead to a degree of standardization because they dictate what can and cannot be done with online records. The guidelines should operate within and across the categories of problems. In this way, although the solutions chosen for quite similar examples of a problem may differ, each will be justified by the guidelines.

The guidelines for problem solving can be based on the editing guidelines established for the main part of the retrospective conversion project. If these guidelines were never formally stated, but evolved in an informal manner throughout the project, the problem-solving librarian can, with a little work, determine what they are. The guidelines can be derived from assumptions inherent in the retrospective conversion project and basic decisions on standards made at the start of the project.

The most important and most often unstated assumption of a retrospective conversion project is the library's attitude on the quality versus quantity issue. If the library has opted for a "quick and dirty" project, this will have a profound effect on the problem resolution phase—there probably will not be one. On the other hand, if a library is using retrospective conversion as a chance to clean up its catalog, the problem resolution phase will resemble a recataloging project. In practice, most libraries try to strike a balance between the two extremes. It is crucial that the problem-solving librarian be aware of where that balance is struck.

Basic decisions on the standards desired for the retrospective conversion project will also affect the problem resolution phase. If the library has opted for less-than-full MARC records for the conversion, then less-than-full MARC will be an acceptable standard for problem solving, unless specifically noted. Likewise, if the library has chosen not to update headings to AACR2 form for the bulk of the conversion, then the problem resolution phase can continue the practice, unless instructed otherwise. If, however, full MARC records and updating to AACR2 are requirements of the retrospective conversion project, then the problem-solving librarian must adhere to these standards.

If the library uses an outside vendor for retrospective conversion and handles problem solving in-house, then the best source for determining the standards used for the project will be the contract specifications sent to the vendor at the start of the project.

In addition, if the library uses OCLC for cataloging, its Bibliographic Input Standards should be consulted for an overall view of when a new record can be created.

Finally, reading accounts of other retrospective conversion projects can help to identify your library's assumptions by pointing out differences between your approach and others.

Drawing upon these sources, and after many conversations with people in cataloging and retrospective conversion, the following guidelines were developed to help standardize the task of problem resolution at the University Library.

1. Try to make as few changes to an existing OCLC record as possible.
2. When changes are necessary, try to make them in the form of additions to the online record rather than as replacements of one piece of information for another. Try especially to avoid making substitutions.
in any field that is indexed on OCLC (e.g., fixed-field dates, or the 260 $c).
3. Create as few new records as possible, using Bibliographic Input Standards as a guide.
4. When making decisions on how to edit a record, follow current AACR2 rules and the University Library's cataloging policy as much as possible.
5. However, do not update punctuation or reformat information to AACR2 standards when editing a record originally entered in pre-AACR2 form.
6. Attempt to update headings to AACR2 form, even if you create a name conflict between our shelflist card and the online record.
7. Try to check that the subject headings used in the online record are current and valid.

Once guidelines are established, it is critical to document decisions made on solving different problems. The guidelines are general enough to be interpreted differently by different people, and specific examples of using the guidelines will help people to reach a consensus on their use. It is also wise to monitor how specific examples of problem solving fit in with the guidelines. If too many practical solutions do not fit them, the guidelines may need to be modified. Documentation becomes especially important when projects are of long duration, with many stops and starts, and staff are of shorter duration. Without documentation, there is no guarantee that successive librarians assigned to retrospective conversion problem resolution will approach their task the same way. This can jeopardize the integrity of the database being created. The University Library developed a manual for problem resolution and kept a file of examples to assist in achieving continuity and standardization in the editing process.

**SUMMARY**

Solving problems for monographic records in a retrospective conversion project is a complicated business that requires a good deal of background knowledge and training. Familiarity with current and past cataloging rules is necessary, both for recataloging purposes and for understanding why a problem occurred in the first place. Knowledge of your institution's cataloging policies also is necessary for the same reasons. If the purpose of the conversion is to create machine-readable records for use in an online catalog and/or for use in an integrated system, then solving problems requires knowledge of those systems' capabilities. Furthermore, if resource sharing is an aim of conversion, the needs of the cooperating libraries must be taken into account.

To achieve a degree of standardization in the problem-solving process, two things are necessary: (1) it is helpful to categorize the types of problems encountered in the problem resolution phase and (2) guidelines on the editing process for online records must be established.

Monographic problem records lend themselves to categorization in several ways, the most useful of which is to sort them in terms of frequency of occurrence and complexity of solving. Unfortunately, there are so many variables affecting each particular problem in a given category that categorization cannot, on its own, result in standardization of the solutions for the
problems. However, because much of retrospective conversion problem solving pares down to deciding how to edit an online record to match a shelflist card, some degree of standardization can be achieved by establishing guidelines to govern the editing procedure for retrospective conversion of problem records. The guidelines can be based on the underlying assumptions of the project and also on the basic decisions regarding standards that will have been made at the earliest stages of retrospective conversion. Applying these guidelines consistently to all problems in all categories results in a flexible standardization—one that is well suited to the problem resolution phase of retrospective conversion.

REFERENCES AND NOTES


**SIMMONS COLLEGE SYMPOSIUM**

The Graduate School of Library and Information Science at Simmons College announces the Simmons College Symposium on Recruiting, Educating, and Training Cataloging Librarians: Solving the Problems to be held March 10 and 11, 1989, at the Simmons College campus, 300 The Fenway, Boston, Massachusetts.

The symposium, made possible by a grant from the Council on Library Resources, features Roben M. Hayes, dean of the Graduate School of Library and Information Science at the University of California, Los Angeles, as keynote speaker.

Session leaders are Paul H. Mosher, director of libraries, University of Pennsylvania, for recruiting; Jane Robbins, director, School of Library and Information Studies, University of Wisconsin-Madison, for educating; and Henriette D. Avram, assistant librarian for processing services, Library of Congress, for training.

These distinguished leaders will be joined by an invited group of recognized experts from the library profession to present papers that explore solutions to the problems of recruiting, educating, and training cataloging librarians. A limited audience will be accommodated on a first-come, first-served basis.

Principal coordinator of the symposium is Sheila S. Intner, associate professor of library and information science at Simmons College. Co-coordinators of the symposium are Janet Swan Hill, head of the catalog department at Northwestern University, and Karen Muller, executive director of the Resources and Technical Services Division of the American Library Association.

For further information, contact Sheila S. Intner, Simmons College Symposium Coordinator, GSLIS, 300 The Fenway, Boston, MA 02115. Telephone: (617) 738-2223 or (413) 528-2698. Electronic mail: ALANET ID—ALA1371.
The Year’s Work in Circulation Control, 1987

Ryoko Toyama

Although policies governing the operation of circulation control vary from library to library, purposes, needs, operational goals, procedures, and staffing patterns remain similar. In recent years, modern technology has had an impact on work flow and procedures of the operation, but not to an extent where national standards were called for.

Despite the importance of circulation control, patrons, staff and library administrations tend to perceive this as a routine operation because it has been a relatively mechanical, though integral, part of the library’s overall operation for so many years. Even its efficiencies or inefficiencies are perceived to be routines. Although the need for it was never questioned and nothing indicates it will be challenged in the near future, circulation control has maintained a low profile among various library functions. This prevailing image may be the reason a periodic literature survey on circulation control has not been popular.

According to the Automation Inventory of Research Libraries (ARL/OMS 1987), of 113 libraries responding to the survey, 106 libraries were implementing, modifying, or planning for an automated circulation system. The majority chose a mechanism to link physical access to bibliographic access points. This requires comprehensive analyses of circulation functions in a broader context, including technical services and collection development. To cope with aging resources, traditional circulation policies may be challenged. How? Nontraditional resources such as online publications are gradually but surely increasing. Will the present concept of circulation apply to new types of publications? These questions motivated this brief survey of circulation control literature.

The scope of the survey is limited to English-language works. More than sixty items were examined initially and forty of them were selected for the bibliography. News items, brief column commentaries, and manuals were excluded, although some of these provided me with useful background information.

The largest number of items published were on automated circulation control. Reports of planning and reviews of the implementation of a system or systems were popular. An experience in a small library (Gaudet) sums up the whole process of switchover from manual to automated operations as the author refers to three roles she had to play: director, automation consultant, and task force. Reports on experiences from larger libraries focus on specific automation aspects. A cost-sharing formula in a regional network (Arcari) is useful for libraries considering a stand-alone model because the author deals with basic unit costs. A general cost profile published in Bottom Line (Murchio) may add another dimension to this topic. Several reports deal with automated circulation systems as part of an inte-
grated system (Griffen). A report on the experience at Ohio State University, covering bibliographic access and circulation control, helps readers share a series of processes involved in implementing an integrated system (Logan). Many Library Software Review articles refer to applications of software for circulation control. Barcoding is a popular topic, too, covering publishers' stock inventory, control of archival materials, control of student identifications and barcoding of library resources. Northwestern University's experience with their Bar Code Project presents useful data (Spalding).

Following the category of automated circulation control, works on performance measures or transaction analysis rank second in number. Works with extensive theoretical analyses are found (Burnell; Revill), including a study on a prediction model linked to the Beta-binomial distribution (Gelman).

Transaction models are inseparable from circulation policies. Works related to the policies constitute another category and rank in third in the number. It is in this category where one of the most comprehensive works of the year and in the field was published. Sheila S. Intner's monograph, Circulation Policy in Academic, Public, and School Libraries, is a significant work on today's circulation control. The policies and practices from thirty-seven libraries are described objectively, and they form a composite picture of circulation control activities. The Work helps practitioners understand how libraries are trying to balance their responsibilities and constraints and also helps identify problematic areas. While Intner's monograph presents a comprehensive picture, several works deal with specific aspects of library policies, including proprietary issues in relation to circulation of software (Maison) or video tapes, problems with collecting fines, and legal issues such as Public Lending Rights (Hyatt; Stave).

There is one notable work on staff training (Hobson). Considering that the staff members working at the circulation desk are the principal personification of the library to many patrons, training of the staff has been neglected. This study hits the spot, reminding librarians of the importance of well-developed training programs.

In conclusion, the majority of works published on circulation control in 1987 were brief, practical reports on implementation of an automated system. Works with theoretical approaches were found for circulation models or transaction analysis motivated by interest in cost factors. A strong indication is in the literature that more libraries will move toward the implementation of totally integrated library automation. Then, studies on circulation control will play a vital role in formulating future models for the integrated system. While practical reports are available and most of them are useful for short-term, there is need for serious studies with a long-range view. Periodic surveys of literature on circulation control may become more meaningful in the future.

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- an essential reference tool for anyone interested in pursuing formal library preservation training
- provides information on conservation programs in North America and other organizations that provide training in preservation & conservation.

A Core Collection in Preservation. Compiled by Lisa L. Fox, SOLINET, for the PLMS Education Committee. $5.00 24p. ISBN 0-8389-7224-1
- annotated bibliography of books, reports, periodicals, and articles covering the entire spectrum of library and archival preservation
- a working resource for administrators, librarians, archivists, curators, conservators, and others working to preserve our documentary heritage.

Order from RTSD Publications, 50 East Huron Street, Chicago, IL 60611.
The Year’s Work in Nonbook Processing, 1987

Nancy B. Olson and Edward Swanson

Guidelines for audiovisual services in academic libraries (2) replacing those of 1968, were approved in 1987 by the Association of College and Research Libraries (ACRL). Their goal is “to support the development and administration of an increasingly important component of college and university service.” However, DuBois, in his article “No Room at the Inn” (10), states that “Though an academic library collection almost always includes microforms, and may even extend to spoken or music material on record or audiocassette, other forms of audio and visual media are relatively rare.” He continues, “These findings are surprising, particularly when one considers that non-print materials have long been included in other kinds of libraries. In elementary and secondary schools, and in community colleges, the media center often is not just another part of the library; it is the library.” He points out that teaching faculty and librarians “have doubts about the scholarly value of non-print materials,” although many departments maintain their own audiovisual collections. The advantages he sees in centralizing these library resources are: bibliographic control, extended service hours and availability of materials, collection development services and budgetary support, and the availability of comprehensive information for accreditation reports.

McNally, in an article on availability of nonbook materials in Australia (22), states that “There is widespread recognition in Australia of the importance of non-book materials as sources of information and few libraries would now exclude them from their collections.” He tells of a recent workshop on research use of audiovisual materials and says their importance as information sources for serious research purposes is widely acknowledged. The Australian Audiovisual Reference Book is the principal source of information on commercially available nonbook materials, though “publishers of non-book materials are not as well organized as book publishers and some do not take advantage of the opportunity to have their publications listed.” The Australian Bibliographic Network encourages cataloging of audiovisual materials. McNally proposes the “development and implementation of a national integrated system for acquisition, bibliographic organization, retention, and supply” of nonbook materials.

Ellison and Coty (12) edited Nonbook Media: Collection Management and User Services, a collection of twenty-two chapters, each by a different author, that follow a uniform style, and include definition and brief history of the medium; unique characteristics, advantages, and disadvantages; special criteria, evaluative and nonevaluative review sources for selection; and storage, care, management, and other concerns related to maintenance and management. Materials covered

Nancy B. Olson is Professor and Head of Cataloging, Mankato State University, Minnesota. Edward Swanson is Principal Cataloger, Minnesota Historical Society, St. Paul.
include [in their terminology] art reproductions, audiotapes, films, filmstrips, flat pictures, posters, charts, study prints, holographs, machine-readable data files, maps, microforms, models, music scores, original art, overhead transparencies, pamphlets, phonograph records, photographs, programmed materials, realia, simulation materials, slides, videodiscs, and videotapes.

**EDUCATION**

Education of catalogers continued to be of concern. In the summer 1987 issue of *Cataloging & Classification Quarterly*, reprinted as a monograph (6), Carter edits a collection of papers that occasionally mentions cataloging of audiovisual materials. Saye states that “It is unfortunate that advanced courses in cataloging appear to be taken mainly by students who have identified cataloging as a potential specialty. This is particularly true for those who intend to be school librarians. Much of the advanced course I teach [at the University of North Carolina at Chapel Hill] deals with the cataloging of nonprint resources, abundant in the schools, but addressed only slightly in the introductory course because of time constraints” (p.39). Soper describes the content of two courses taught at the University of Washington including work with audiovisual materials (p.53). Thirty-four of fifty-five accredited programs surveyed claim to teach something about cataloging audiovisual materials, although many include it only as part of the basic cataloging course description.

Bishoff (5) states that “Although original cataloging of monographic works has significantly diminished due to the availability of data through bibliographic utilities, the cataloging of audiovisual materials . . . is often necessary. . . . We still need catalog librarians with the necessary skills and expertise to handle this type of work.” Swanson (14) reminds us that catalogers “have to be given the opportunity and responsibility to continue to review documentation as it comes out. Also people should stop and look up the rules. They think they remember, and errors happen when people who think they remember don’t. . . . It’s a matter of education and review of the documentation” (p.20). Olson (28) points out that “users of OCLC must master eight [MARC] formats, each filling a three-ring binder” in her description of the complexity of cataloging and constant development and change of cataloging rules, rule interpretations, classification schedules, subject headings, MARC formats, OCLC [and other] systems, and system documentation.

**CATALOGING, MARC CODING AND TAGGING**

Intner and Smiraglia prepared *Policy and Practice in Bibliographic Control of Nonbook Media* (19) based on the regional institutes on nonbook materials sponsored by the Resources and Technical Services Division. The book, as did the institutes, includes theoretical papers as well as practical guidance in cataloging, coding, and tagging nonbook materials. Chapters were contributed by Jean Weihs, Hugh A. Durbin, Lizbeth Bishoff, Arlene G. Taylor, Carolyn O. Frost, Leigh S. Estabrook, and Nancy B. Olson, as well as by Smiraglia and Intner.

At a workshop held by the Online Audiovisual Catalogers (OLAC), Thaxter discussed the problems of material available in multiple versions. While this problem exists for all types of materials (e.g., a book in paperback versus hardback; a book and its microform copy; music on disc, cassette, compact disc; a “film” as a motion picture or a video), the problem is most common in audiovisual material. As Urbanski reports in the *OLAC Newsletter*, “Cataloging rules and the MARC formats will never keep up with the pace of technology. AV catalogers will always have to invent solutions, adapt rules for physical descriptions, make decisions about handling multiple formats. What the cataloging rules and formats should do
is to allow enough flexibility to deal with the situation in a variety of ways” (47, p.14).

The major development in MARC in 1987 is the format integration proposal under discussion by MARBI, LC, and others in the USMARC advisory group. The proposal is summarized by Griscom in the Music Cataloging Bulletin (23, 43). The proposal would result in the integration of all MARC formats into a single format. The ideal is defined as a format “that contains data elements that can be used to describe any form of material: textual (such as books, theses, journals, technical reports), motion pictures, videorecordings, graphic materials, three-dimensional artifacts and naturally occurring objects, maps, music, and computer files. An integrated format would also provide the means for describing the serial-related aspects of any of these items as well as any archival characteristics present, regardless of the medium or form of material” (23, p.6).

Anderson (4) suggests using the OCLC M300 (or similar workstation) to produce statistical reports on technical services activities, including new, added, and total titles of records, compact discs, cassettes, and videotapes. A spreadsheet program is useful to keep track of holdings by media and classifications.

Scarseth-Aurora (41) reports on an OLAC conference panel discussion on bibliographic utilities in the year 2000.

Computer Files

Problems of cataloging computer materials were resolved in 1987 with the publication of a draft revision of chapter 9 of the Anglo-American Cataloguing Rules (17). This publication replaced both the original chapter 9 and the Guidelines for Using AACR 2 Chapter 9 for Cataloging Microcomputer Software (ALA, 1984). The rules will appear in the 1988 reprinting of AACR2 in essentially the same form; there may be changes in detail, but the concepts will not be changed.

The revision of chapter 9 establishes the General Material Designation computer file for material formerly called machine-readable data file and is applicable to those items available by remote access as well as physical items in hand. Physical description is used in area 5. For computer files available through remote access, area 5 is omitted; area 3 is used for file description for these items. Area 3 may also be used for file description in bibliographic records for items with physical description in area 5.

The system requirements note is required when data is readily available. A note giving source of title proper also is required.

Gorman introduced the draft revision at an OLAC program in San Francisco. Gegenhuber summarizes his suggestions on coping with computer files and his answers to attendees’ questions (15). His talk, the question-and-answer session following it, and some case studies involving computer files in libraries are available on sound recording (16). Patton and Weitz (32) tell OCLC users how to work with the revised rules when preparing bibliographic records for input into the OCLC database. Urbanski (49) continues to answer questions about cataloging computer files (and other audiovisual material) in her column in the quarterly OLAC Newsletter. Adcock (1) prepared, for school librarians, a booklet on cataloging microcomputer software. His text and examples were based on a combination of the draft revision and the 1984 guidelines.

A draft ISBD for computer files was discussed at the 1987 ALA Midwinter Meeting by CC:DA and approved with minor editorial corrections (3). At Annual Conference the CCS executive committee invited the Computer File Cataloging Discussion Group to affiliate with the section as an authorized unit of CCS.

LC’s Cataloging-in-Publication (CIP) project for computer files began supplying CIP data to publishers of microcomputer software. (Patton (31) reported that
OCLC record #16313206 is an example of a cataloging record based on CIP data.

Robbins (36), in a report of a conference held in Great Britain on access to audiovisual material, suggested large public libraries set up inspection centers for computer hardware and software so members of the public can try them out to be able to make informed and intelligent decisions when buying.

**Motion Pictures and Videorecordings**

Catalogers in LC's Motion Picture, Broadcasting and Recorded Sound Division began inputting records for films and TV programs into its MARC database in October 1986 (38). They use their own descriptive cataloging rules with LC subject headings. Complete name authority work is done with the help and guidance of Thaxter and his staff. (An example of their work is OCLC record #17323943.)

*Cataloging Service Bulletin 36 (7)* carried a revised interpretation for rule 7.1F1 concerning the treatment of rock music performers who star in music videos.

Thunell (45) reported Bidd's presentation on FORMAT the computerized information system for Canadian-produced audiovisual materials. Subject indexing is done using PRECIS. Massey (29) summarized the activities of this OLAC conference for which Shirley Lewis gave the keynote address on "Technology: The Tail or the Dog?" (24).

The Dow Memorial Library in Midland, Michigan, prepares an annotated catalog for its collection of videocassettes. Although they use OCLC for all their other cataloging, they catalog their videocassettes on an IBM system using dBase III+. Dykhuis (11) describes their system for this process and the programs he wrote.

**Two- and Three-Dimensional Materials**

Weitz (50) gives guidelines for determining values for OCLC fixed fields "Type" and "Type material" for many two- and three-dimensional materials, including those added to the format in 1986.

**Sound Recordings (NonMusic)**

Elrod discusses problems of cataloging recorded copies of material published at an earlier date (13). These "talking books" are cataloged using the place, name, and date of manufacture for information on the recording, added after the place, name, and date of publication of the original book. The number of pages recorded is given in curves following the extent of item statement. A GMD "talking book" is used following the first title proper. Elrod emphasizes the need to create "meaningful COM cataloging entries and online catalog displays."

Urbanski (49) answered questions related to sound recordings in her column in the OLAC Newsletter.

**Sound Recordings (Music)**

LC issued a new interpretation of rule 5.1F1 to be applied when the performer's name is featured on the chief source of information on a popular music folio (7), appearing in *Cataloging Service Bulletin 36*.

LC continued to report music cataloging decisions (25) and music-related rule interpretations (39) in the *Music Cataloging Bulletin*. It regularly includes changes to LC class numbers and subject headings for music, and lists retrospective conversions of music records to MARC, as well as AACR2 bibliographic records that contain major changes. As space permits, questions asked LC and responses are printed (21). The *Music OCLC Users Group Newsletter* provides helpful information, including Weitz' column (51) reporting progress at OCLC in the area of bibliographic control of music.

During the Music Library Association's 1987 conference, Alan Pope of IAML
A cooperative retrospective conversion project of music at the Eastman School of Music, Indiana University, and the University of California at Berkeley was reported by Olsen (27). Almost 30,000 bibliographic records for music scores and books were input into OCLC and RLIN (26, 27). A retrospective conversion project for scores at Oberlin Conservatory Library was described by Snyder and reported by Swanekamp (44). Robson (37) described a barcoding project at Case Western Reserve University. Multiple bibliographic records for one physical item (sound recordings, "bound with") and multiple physical items for one bibliographic record (scores with parts) caused problems.

Jerde described a project of preservation and bibliographic organization of print and manuscript popular music from the Hogan Jazz Archive at Tulane University (20). Using OCLC, the four-year pilot project cataloged about ten percent of the collection, providing online access through NOTIS.

Robbins (36) described the National Discography that is to hold information on all recordings issued in the United Kingdom.

NAME AUTHORITIES

A survey of NACO participants was discussed at the January meeting of OLAC’s Cataloging Policy Committee as reported by Chang (8). Urbanski (48) reported the committee will continue efforts "to get more nonprint names contributed to the LC authority file via NACO participant submissions."

SUBJECT CATALOGING

In response to a query, Urbanski investigated LC’s use of the subject heading "Deaf, Films for the" (46). The questioner wanted to know what to do for videos that are closed-captioned for the hearing impaired. Urbanski reports the heading is now changed to "Films for the hearing impaired" and "Video recordings for the hearing impaired." The headings are to be applied to films/videos produced with captions or sign language for viewing by the hearing impaired. They are not to be used for foreign films subtitled to aid viewers unfamiliar with the spoken language.

LC published a thesaurus for graphic materials compiled by Elisabeth Betz Parker (30). The list contains more than 6,000 terms for subject access to graphic materials. While designed for LC’s use, it can be used by anyone working with MARC records.

COPYRIGHT AND LEGAL DEPOSIT OF MATERIAL

An article by Stanek (reported in "The Year’s Work in Nonbook Processing, 1986") prompted an exchange of letters (40) between the law firm of Sargoy, Stein, and Hanft (SSH) and ALA’s executive director. The original article expressed opinions of ALA’s legal counsel regarding library use of copyrighted videotapes. SSH represents several motion picture production and distribution companies. The original article and this new correspondence should be studied by librarians involved with collection and circulation of motion pictures and videorecordings.
Pinion (33) studied the problems of legal deposit for nonbook materials, particularly in the United Kingdom. She conducted a survey of deposit systems in other countries and includes results for the 37 countries including the U.S., which have copyright laws specifying deposit of certain nonbook materials. Her conclusions include recommendations that state: “A national collection or collections of materials provides a valuable source of information for future researchers and scholars. It is also increasingly important, in an age when telecommunication is so important as a means of communication, that this is reflected in the national heritage” (p.69).

McNally (22) reports that there is no requirement for legal deposit of nonbook materials in the National Library of Australia, nor is there a national policy for coordinated development of comprehensive nonbook collections.

Croghan (9) reports the British Library is “not looking to extend its own collection activities beyond the formats it already acquires” despite its first objective “to ensure the availability of a comprehensive and permanent repository of recorded British material in all fields, published or otherwise.” He makes ten proposals, the first of which is for the British Library to commit “0.05 percent of its budget to non-book material” and explains that “This is clearly a function of the national library of the nation that has been in the forefront of the use of non-book media from their inception.”

**CONSERVATION AND PRESERVATION**

An important paper by Harrison (18) discusses collection, conservation, and preservation of audiovisual materials. She distinguishes between preservation and conservation: “Preservation implies long-term archival storage and the maintenance of a record in the best possible condition, while conservation is the maintenance of a record which allows a reasonable amount of use at the same time. Preservation also includes restoration and transfer of material from one medium to another” (p.154). She also says, “Whether or not we acknowledge all audiovisual materials should be preserved as a matter of course is not the immediate question, but that some audiovisual materials must be preserved should not be a matter of doubt. Audiovisual materials carry information which needs conservation, therefore the carrier will need conservation. . . . Conservation is about keeping documents in a decent state of preservation. It is also about maintaining a collection in this presentable state, and finally it is about making the materials available to both present and future users” (p.154).

Harrison points out that “Developing technology has produced numerous standards and formats . . . almost without exception each format requires different playback equipment and this adds a further dimension to the preservation problem—the playback machinery has to be preserved. . . . A conservation policy has to allow for a constant transfer of material from one format to a more up-to-date one, and equipment suitable for replaying, or at least transferring, elderly formats to newer, usable formats has to be maintained in working condition” (p.156-57).

McNally (22) reminds readers that “As materials are withdrawn from library collections it is important that they be accepted by a library with a policy of permanent retention.” There must be some policy for ensuring that “last copies” are not lost.

Pinion (34) reports on a seminar on preservation of audiovisual materials held in Berlin in May 1987 by UNESCO. The seminar was designed to “discuss in detail the training needs for those involved in the collection and preservation of audiovisual material, with particular consideration as to the requirements of those in Third World countries.”

The “importance of preserving the human record” is emphasized by James
Michener and others in the film Slow Fires: On the Preservation of the Human Record (42). While it focuses on the problems of deterioration of books and other printed materials, the need to preserve films, maps, and other materials is also addressed.

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High-Tech Shopping for Serials Automation: Linking Public and Technical Services

Pamela Bluh and Will Hepfer, Editors

This is the second of four papers comprising this subsection of *LRTS*. The papers were originally presented at the RTSD Serials Section program on June 27, 1987, in San Francisco, California.

In keeping with the nature of its subject, “High-Tech Shopping for Serials Automation: Linking Public and Technical Services” is being published serially; one paper appeared in the April 1988 issue, the second is in this issue, and the others will be in subsequent issues of *LRTS*. We hope you will find them as illuminating as their San Francisco audience did.

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Selecting a Serials System:  
The Technical Services Perspective

Jean Walter Farrington

Criteria for selecting an automated serials control system are explored. Considerations include specific system features, database creation and maintenance, local and national standards, technical and environmental factors, and future developments. Taking a realistic view of the options available and close cooperation with public services staff are stressed.

Until recently, technical services has been viewed as a back room operation having little, if any, ongoing contact with the public. With the advent of online catalogs and the creation of dynamic databases, the distinction between technical services' and public services' functions is beginning to blur. Technical services staff work with the online database, entering new orders and acquisition records, recording receipts of monographs or serials online, and providing call numbers and access points needed for the retrieval of materials by the users. Since the seventies, automation has entered all areas of the library, but especially technical services. In the eighties, life in technical services is definitely "life in the fast lane."

Presley compares working in a serials department that has an online system to working in the middle of a goldfish bowl.¹ The goldfish bowl syndrome is an apt characterization since the functions that serials staff perform are more visible to patrons than ever before. In today's library, automation encourages and requires greater dialogue between public and technical services staff.

In evaluating a serials system, five basic areas should be considered. The importance of these five areas will be relative, depending on the type and size of library for which the system is intended.

SYSTEM FEATURES/CAPABILITIES

Most libraries, whether considering a stand-alone or an integrated serials system, are concerned with the functions of ordering, receiving, claiming, and paying, as well as binding control and routing. Comprehensive lists of specific features have been presented in the literature by Rush, McQueen, and Boss.² What follows are the most significant features and some of the key questions to be considered. When reviewing the features and capabilities of a serials system, the first to consider is check in. What are the mechanics of checking in an issue? How easy is it to identify the record on which an item is to be checked in? Can the record be located through a variety of access points such as title, ISSN, or library order number? Does the initial search put the user into the check-in screen or is it

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necessary to go through several intermediate steps to get to the precise spot in the record where issues are recorded? How many keystrokes are required to check in the next expected issue? Is it predicted by the system, or does the user have to fill in the blanks? Does the system supply the date the issue was checked in? How does the system handle multiple copies of the same title, either for the same location or for different locations? Is there one unified check-in record or separate ones? What kind of flexibility is there for dealing with special issues, unnumbered supplements, and other extra pieces? What happens when the title changes frequency, either adding issues or reducing the number published per year? The answers to these questions regarding check in may well influence a library’s decision about a serials system.

Next, how is the claiming process handled? What is involved in claiming gaps or issues not received in sequence? How does the system identify titles that just stop coming? Does the system automatically generate claim letters, and is there an option to review claims before they are printed? How are claims for new orders handled? From the technical services perspective, automatic claiming is one of the greatest advantages of an online serials control system. In a manual environment, ongoing claiming, especially of titles that stop coming, is an imperfect operation at best. In an online environment, it should be handled much more effectively.

Binding control should also be considered. What are the system’s capabilities for generating lists of titles ready to be bound and/or binding slips to accompany the volume to the binder? Will the system keep track of volumes out for binding? What happens when the volume is returned from the bindery? Is there a straightforward mechanism to check it in and reflect it in bound volume holdings? If binding control is not currently available, what are the vendor’s plans for providing it? In an integrated system, what is the relationship between the binding function and the charge and discharge functions of circulation?

The treatment and display of holdings information, both issue-specific and summary holdings, are also critical questions that need to be raised. How is information about currently received issues displayed? How does the information move through the system to the public display? When and how are serials holdings updated? Is updating an automatic process or the result of a batch process or a manual operation? Does the system allow for the use of the MARC format for holdings, and, if so, what are the steps involved in implementing it? The area of holdings is one of the biggest reflections of the goldfish bowl syndrome. The Kardex has gone public, and serials check-in records in their entirety, warts and all, may now be fully revealed to library patrons! The online environment provides immediate access to information, resulting in definite implications regarding the speed at which newly received journal issues are available for use and how patrons are taught to interpret current holdings information. Dealing effectively with this new visibility is an issue that deserves to be addressed jointly by technical and public service staff.

Fund accounting is another crucial element of a serials system. With the proliferation of journal titles and the increase in the number of narrowly defined specialties and subspecialties, each meriting its own journal—a
process known as “twigging”—it is incumbent upon serials librarians to know how and where they are spending their subscription dollars. In addition, since 1985 the American dollar has fallen 40 percent or more against many foreign currencies. The need to monitor price increases by country of publication, by publisher, and/or by subject is very important. In the serials system, how sophisticated is the fund accounting part of the serials package? Will the library be able to load invoice tapes from its main vendors? Is it possible to keep track of both encumbrances and payments for a number of separate funds? What are the steps involved in paying a single item invoice online? What are they for a large renewal invoice? How are credits and added charges handled? Will the system do currency conversions so that invoice amounts may be computed in dollars? Can the system list the titles and compute the value of subscriptions that have been cancelled?

Management reports are also an important component of serials control. Will the system supply, in print form, data on how the library spends its serials monies? Is it possible to acquire totals for such items as the number of periodical issues checked in each day or each week? How many new orders were placed and, of these, how many were foreign? How many claims were generated last month? How many issues per hour can the average clerk check in?

How are free-text notes handled? While this may seem insignificant and indicative of the “Kardex bias” many serials librarians have, notes or special instructions can be very useful, even in an online environment. A special field should be available for this purpose.

In the past year, interfaces between various library and vendor systems have become a reality. Many firms actively engage in the development of interfaces for the online transfer of orders and claims, as well as for loading invoice tapes directly into the local online system. Both EBSCO and Faxon are working with NOTIS to design software that will permit the loading and posting of invoice tapes. This is already possible with Geac and Innovative Interfaces. Purchasers of serials systems should ask about current capabilities and future developments in this area.

In the final analysis the questions to be asked are, Does the system do well those serials functions the library considers most important? Or does it perform them acceptably in the context of an integrated system or the local computing environment?

**DATABASE CREATION AND MANAGEMENT**

In the area of database creation and maintenance, the size of the active serials collection, the number of serials records available in machine-readable form, and the type of system in which the library is interested (stand-alone, vendor-based, or integrated) are all of significance. The question of database creation is generally more critical if the active serials collection is large and if the desired serials system is not vendor based. If the serials database is part of a larger bibliographic database, a full MARC record most likely will be desirable. If the serials database is conceived as an independent file, the records may not have to be full MARC. Even in a small database, however, there is a strong tendency toward MARC rec-
ords because MARC is the accepted standard. At issue is the question of how the library is going to create records for the system. What will the serials system vendor provide in the way of database services? In a large vendor-based system, essential bibliographic data may be provided, as well as such local information as call numbers, which are taken from the library's master serials record file. In an integrated system, the work of creating the database may be left, in large part, to the individual library.

The way in which holdings information is loaded and displayed in the database is also of concern in selecting a serials system. How does the load program map one type of machine-readable record to another? It is far less complicated to load local call number and location information for monographs and monographic sets than it is for serials. It is extremely important, therefore, to comprehend beforehand how the serials system actually operates and how the different parts of the record are interrelated. If library staff have invested time and effort into providing comprehensive holdings information on existing records, it is important to know whether that information will be carried over into the online record. Creating online serials records may be a two-step process. The bibliographic data may be loaded first, and then fields to handle local details for ordering, checking in, and controlling invoices are created. Establish realistic goals for implementation, and be prepared for a more difficult and more time-consuming task than originally anticipated.

STANDARDS

Standards in serials are related both to network and utility commitments the library may have, as well as to existing local requirements. Specifically, the following should be considered: Is the library a participant in any regional union lists of serials or in other cooperative holdings databases? If so, how are the library's holdings provided to these organizations, and will such participation still be possible in the new serials system environment? For libraries selecting integrated serials systems and planning to migrate their cataloging function from a utility to the local system, what are the contractual obligations to the utility and the costs involved in continuing to meet those obligations? What impact would this have on interlibrary loan operations? What resource sharing of title and holdings information needs to be considered? Compromises may have to be made in the way in which serials holdings information is recorded in the online system, because inconsistencies become glaringly obvious in an online environment and can lead to confusion in interpretation.

TECHNICAL AND ENVIRONMENTAL FACTORS

The library's current computing environment, as well as the need for hardware compatibility between the serials system and other computer equipment, should be taken into consideration. For the moment, computer compatibility should still be considered a factor as libraries participate in local area networks and dial-up capabilities from personal computers become available. In selecting a serials system, a great deal depends upon the size of the operation and the requirements for interconnections within an institution or organization.
THE FUTURE

Obsolescence in computer systems occurs rapidly. In planning, anticipate the future and select a system that will be adaptable to changes in the world of serials automation. Consider such basic issues as whether the system utilizes state-of-the-art programming and what kind of software enhancements are planned and how frequently they are installed. What is the system’s track record on delivery of new software? Is it received truly debugged and ready to install? The best source of this information is other users, either polled informally or consulted through an established users’ group. Serials check in using the SISAC code is now a reality. In selecting a system, the library should be sure that the necessary equipment, such as laser scanners, can be used. Most serials librarians will want to take advantage of all that technology has to offer, including the MARC holdings format, predictive check in, binding control, and the latest interfaces for such sophisticated activities as loading and creating additional files.

CONCLUSION

Three caveats pertain to the technical services perspective of serials automation:

1. Look for what is needed in a serials system, but try not to be overly particular in the specifications. Above all, be realistic!
2. Study the work flow but do not expect to mimic it in the online environment. Be prepared to be flexible in staffing, and plan to make changes in specific job descriptions if necessary. Superfluous steps may be eliminated.
3. Evaluate the impact of having check-in information available to patrons immediately upon receipt, and plan to deal with the consequences. Close cooperation between public and technical services staff is essential. Only by working together can we establish reasonable expectations for availability of material and communicate these expectations to the user community.

The overall goal in selecting a serials system is to use one’s shopping list intelligently to purchase a serials system that meets the needs of the patrons and the staff in providing comprehensible serials information in a timely fashion.

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Ring Out the Old, Ring in the New

Verna Urbanski

One of the exciting aspects of working in libraries in the fading days of the twentieth century is the prospect of viewing firsthand the replacement of the old with the new, the accepted with the innovative, the limited with the limitless. It isn’t just the technologies that are evolving. The whole rhythm of thinking and planning, of how libraries are viewed and how they view themselves, is changing to new patterns. Part of the change is a natural adaptive evolution brought on by opportunities presented by automation; part is a change in mind-set from passive to active. Librarians increasingly are doing for themselves rather than waiting to be done for. This trend is clearest in companies like Personal Bibliographic Software, Inc. (PBS), founded by Victor Rosenberg, a professor at Michigan’s School of Information and Library Science. For seven years, the company has busily created software packages so librarians, scholars, and researchers can access and manipulate bibliographic information. PBS products, Pro-Cite, Biblio-Link, and Pro-Search, offer flexibility and help exploit the potential of existing databases. Pro-Search is a search aid package that simplifies search commands in Dialog and BRS. Biblio-Link software lets the user capture information from databases, which is then formatted and manipulated using Pro-Cite.

Biblio-Links are reformatting programs that convert records from online databases to Pro-Cite records. Separate Biblio-Link programs are available for use with National Library of Medicine’s MEDLARS database, Library of Congress’ SCORPIO and MUMS databases, and with OCLC and RLIN databases. Recent additions to the Biblio-Links family include programs to convert records from NOTIS (Northwestern Online Total Integrated System), Biblio-file, Mitinet, EBSCO/RETRO, and other systems using the MARC communications format. Custom Biblio-Link programs can be provided to transfer records from local databases.

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Note: this column is based on information from press releases furnished by product manufacturers and distributors. No attempt is made to be comprehensive, and mention is not an endorsement by LRTS or RTSD.
Pro-Cite is, in the simplest terms, a text and database management system allowing the user to manipulate the text of bibliographic records into a format suitable for subject bibliographies, reading lists, lists of recent acquisitions, etc. Pro-Cite is available for both IBM and the Macintosh. PBS’ most recent product, Pro-Cite for the Macintosh, is the enhanced version of Professional Bibliographic System for the Macintosh. It runs on Macintosh Plus, Macintosh SE, or Macintosh II and requires 512K memory and Macintosh System 4.1 or greater. A two-floppy-disk drive or hard disk are recommended. Pro-Cite has twenty-six workforms, twenty predefined for various styles of bibliographic citation, journals, books, dissertations, etc., and six that can be user designed. Records can be entered by the user or captured from another source using Biblio-Link. Once in a Pro-Cite database, records can be sorted, searched, edited, and formatted into citations. Pro-Cite fields and records are of variable length. Pro-Cite database manipulation features full-screen editing, global find and replace functions, and pop-up authority lists.

So, why do we care about Rosenberg’s innovative software? We care because software like this can exploit more fully the painstakingly assembled information languishing in bibliographic databases. Local online catalogs soon may be rendered into a variety of useful and needed research tools far beyond the original concept of the bibliographic record. Assembling information is half the job; using it wisely is the other half. Current cost for Pro-Cite is $395. Biblio-Link is $195 per program.

In addition to EBSCO’s joint venture with PBS for a Biblio-Link/Pro-Cite package for EBSCO/RETRO, a service that provides MARC cataloging for serials, EBSCO has also obtained exclusive rights to the online database of Kraus Reprint and Periodicals for its EBSCONET subscription customers. Requests for reprints, back issues, or back sets are investigated and a response sent via EBSCONET or by mail.

EBSCO also recently entered the CD-ROM playing field with MEDLINE/EBSCO CD-ROM, a product intended to provide economical access to MEDLINE data. The system is available in two versions: a one-disk version is called CORE MEDLINE/EBSCO CD-ROM and contains the Abridged Index Medicus titles and all English-language nursing and dentistry titles; a two-disk Comprehensive MEDLINE/EBSCO CD-ROM includes the English-language subset of Index Medicus, International Nursing Index, and Index to Dental Literature. Each version covers the current year and the two previous years. Searches can be conducted using author, title, subject, CAS Registry Number, ISSN, keyword, and Boolean operators (AND, OR, NOT). Producers claim that EBSCO’s search software speeds access. MEDLINE/EBSCO CD-ROM can be purchased as a complete package, including PC and CD-ROM player, or only with what is needed to equip the customer’s existing PC system to accept the discs.

Amdek Corporation recently introduced Laserdek 1000, an internal half-height CD-ROM drive that installs in a floppy drive slot on IBM PCs and compatibles. Laserdek 1000 operates from the PC’s power supply and comes with all that is necessary for installation: an interface card, device driver, cable, audio software, MS-DOS/CD-ROM extensions, and manual. CD cartridge and headphone jack are also included. Stereo audio
hookup is also available. Amdex's CD-ROM drives provide information in text, audio, and graphic form simultaneously, according to publicity releases. Laserdek 1000 costs $895 and is available from Amdex dealers and distributors.

And, how about building your own CD of documents you want to store, manipulate, or both? Compulink Management Center of Torrance, California, introduces the LaserFiche System, calling it "a totally integrated document search, update, archival and retrieval system utilizing the latest in laser technology." LaserFiche System is said to be the perfect replacement for files of paper records, microfiche backup copies, and "computer data entry/database management systems."

Documents can be scanned into the system individually, interfaced from a mainframe system, fed in via modems or fax boards, or (horse and buggy enthusiasts, listen up!) keyed directly in. The optical scanner accepts both text and graphic information and reads typeset, offset, typewritten documents, photocopies, and documents prepared on laser printers, impact printers, and letter-quality dot-matrix printers. Documents are digitized, indexed, and stored on a WORM (Write Once/Read Many) optical disk. No preformatting is necessary before scanning. Each word of a document indexes automatically, so retrieval is accomplished by entering a known word or phrase with additional subsearches available as needed. Retrieved text can be edited before output with the resulting text printed by laser printer or "faxed out via an optional facsimile interface board," according to Compulink literature. Each optical disk is said to have a capacity equiva-
lent to 180 file drawers. And, this system can be yours for only $45,000. Basics in the LaserFiche Model 3000 include a 32-bit processor running at 20 MHz, with 2 megabytes of RAM, 340 megabytes hard disk, 800 megabyte WORM optical disk, 60 megabyte streaming tape drive for backup, an optical scanner, and a laser printer.

Coming back down from the hi-tech stratosphere, small libraries with manual catalogs may be interested in Follett Software Company’s Quick Card, a catalog card production system. The software is available for Apple IIe, IIc, 80-column (version 2.7) and IBM PC (version 2.8). Originally released in 1984, Quick Card not only prints catalog cards and pocket, spine, and book-card labels but can also upload catalog records to Follett’s Circulation Plus automated circulation system. Quick Card offers the option of AACR2 cataloging or a less comprehensive approach and Dewey or LC classification. The program offers user-customized formats, supported by a manual and tutorials. Cards for all entry points are generated from the once-entered information. Longer bibliographic records are automatically accommodated on additional cards. Diskettes can be erased and reused or kept as machine-readable versions of the printed cards. For those interested in keeping the data disk, Quick Card prints one card that identifies the diskette containing the bibliographic record. Quick Card works with dot-matrix or letter-quality printers equipped with movable tractor feeds. Producers say Quick Card can be used by persons with no knowledge of computers or programming. Current price for the program is $234.95.

**QUICK TIPS AND INTERESTING INFO**

Free, Free, Free!!! University Microfilms International Out-of-Print Books on Demand is giving away its 1988–89 Author Guide to Out-of-Print Books on microfiche. The 1988–89 Author Guide shows what out-of-print books are available from UMI. The 1988–89 Author Guide replaces the 1985–86 edition. Current prices, ordering information, and complete bibliographic information are included in the fiche. The 114,000 titles cited on the fiche are reproduced on acid-free paper, with cloth or paper covers. For a complimentary copy of the guide, see below.

The National Library of Medicine, alarmed at the rapid deterioration of medical literature, is campaigning to encourage publishers of medical books and journals to adopt permanent, acid-free paper for their publications. The library’s Board of Regents has appointed a Permanent Paper Task Force of publishers, editors, librarians, and paper manufacturers. The task force’s mandate is to promote the use of permanent paper with medical editors and publishers and to advise the library on matters related to saving the deteriorating collections of medical literature.

As an update to last quarter’s column on OPACs, General Research Corporation (GRC) announced recently that their online public access catalog LaserGuide is now “instantly” updatable and provides rapid, transparent access to bibliographic records stored on a hard disk. New titles cataloged using LaserQuest are transferred to the LaserGuide hard disk using Laser-Merge, a software program from GRC that indexes the new titles and merges them with titles already on the LaserGuide hard disk. These new records are immediately available to users. LaserGuide searches the hard
disk and the CD-ROM disk simultaneously, making the search of two sources transparent to the user. Search results display recently added titles first and label them "New acquisitions." The system can defer remastering of the CD-ROM disk until the LaserGuide hard disk is full.

For further information about any of the products mentioned in this article, contact

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412 Longshore Dr.
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Book Reviews

Richard D. Johnson, Editor

USMARC Format for Authority Data, Including Guidelines for Content Designation

USMARC Specifications for Record Structure, Character Sets, Tapes

USMARC Code List for Languages

Scientific Journals: Issues in Library Selection and Management

Approval Plans


These three volumes demonstrate that efforts are being taken to make USMARC documentation easier to use even as the subject matter becomes more complex. Each deals with one of the three components of a USMARC record: record structure, content designation, and content. The purpose of USMARC Format for Authority Data is to define content designators—the tags, indicators, subfield codes, and coded values that characterize the data elements in USMARC authority records. This document evolved from a preliminary edition (1976) and a first edition (1981, with updates), both entitled Authorities: A MARC Format. The first edition brought such major changes as the inclusion of series authority and series treatment information, the redefinition of control subfield 4w, and a loose-leaf format. The 1987 edition builds on these changes, providing a much more detailed introduction as well as expanded guidelines for the application of content designators. National level requirements are also included, because machine-readable authority records that are contributed to a national database must comply with certain content requirements.

The book is well equipped with helpful examples and references to related fields and other documents. The appendixes provide useful tables and summaries, such as the alphabetical lists of ambiguous headings (e.g., corporate versus geographic).

The format has improved considerably since the preliminary edition. Information is clearly and logically arranged. Parallel concepts contained in different fields are set off with lines and standardized, boldface headings. Tab dividers organize the nine sections and seven appendixes. The information is
intended to be kept up-to-date by new and replacement pages. The vinyl-covered binder is sturdy, and a title is printed on both spine and cover.

**USMARC Format for Authority Data** will be useful for librarians and others working with the creation, alteration, or interpretation of machine-readable authority records. The document assumes some familiarity with Anglo-American cataloging principles and MARC structure. It might be helpful to use it in conjunction with **USMARC Specifications for Record Structure, Character Sets, Tapes**. The latter volume, an implementation of the ANSI Z39.2 standard, describes in technical terms the structure, character sets, and magnetic tape format of USMARC records in general. It is intended to be used by persons involved in the design and maintenance of systems dealing with communication and processing of USMARC records and assumes quite a bit of familiarity with MARC, ASCII concepts, and magnetic tape format. References to related documents and standards are listed throughout the book. Revisions are intended to be incorporated in reissued versions.

One of the content elements of USMARC authority, bibliographic, and holdings records is the language associated with an item. The **USMARC Code List for Languages** contains 373 discrete language codes, 85 of which represent language groups rather than individual languages. The brief introduction succinctly explains the concept of group versus individual language codes, as well as the overall arrangement of the list. The format is enhanced by the use of boldface entries and numerous "USE" and "UF" ("used for") cross-references. One part is arranged in name sequence and the other in code sequence. The list contains more languages with group code assignments than did previous versions and includes all codes valid as of February 1987. It is also intended to be reissued as needed to incorporate revisions.—Christina Sokol, Washington State University, Pullman.


Librarians ordering this volume or receiving it on standing order might receive a surprise when they examine it. What Haworth’s publicity identified as a monograph treating the acquisition and management of scientific journals is, for all practical purposes, a collection of Stankus’ articles reprinted from various journals. Of the fourteen articles contained in this volume, four are reprinted from Haworth’s *Science and Technology Libraries*, three are from other Haworth journals, and four are reprinted from non-Haworth journals; only three are offered here for the first time. Of 218 pages, 36 are original material.

Stankus is credited on the title page as being the editor of the volume, but he is actually the author of each article, some of which are coauthored. It is difficult to determine how Stankus acted as editor, except in writing brief introductions to the four sections of the book. Haworth’s policy of not having authors review page proofs relieves the editor of that role. This policy, however, strikes the death blow to *Scientific Journals*. Each article was reset, and the typesetters made a great number of terrible errors. For example, on page 33 one finds the following sentence: “The human circumstances unobtrusive methods of determining when a scientist’s apparent cessation of surrounding an individual’s termination of publishable research are discussed in conjunction with findings from the Sociology of Science.” This sentence is quite clear in the original. Incidentally, not all of the original articles were easy to locate because of two incorrect citations.

Stankus’ writings reflect his position as a college science librarian and concentrate on publishing characteristics of faculty members as criteria for selec-
tion of journals for faculty use. He describes the articles as "an ongoing series on the career-long interactions of scientists and their journals and its meaning for subscription management" (p.34). Stankus has devised creative uses for ISI's Journal Citation Reports and, in fact, conducts nearly all of his research on this database. Librarians responsible for science collection development and not having access to the original articles may find the volume useful.—Marcia Tuttle, University of North Carolina at Chapel Hill.


Approval Plans, SPEC Kit #141, updates a similar kit published in 1982, and not much has changed in the last four years. Results from the survey sent to the 118 members of the Association of Research Libraries show that approval plans continue to find wide acceptance. Of the ninety-four respondents, eighty-eight (93.6 percent) had approval plans; but the number of plans per library varied from one to seventy. More importantly, total annual expenditures ranged from a low of $800 to a high of $1,000,000.

Libraries have adopted approval plans to save staff time, improve collection development, and assure faster receipt of materials. They dislike approval plans because selectors tend to accept marginal materials and because they still must review coverage for missed items. Surprisingly, only twenty-four libraries responded that automation had caused them to change their use or management of approval plans; and only fourteen had direct transmission of data between an automated acquisitions system and an approval vendor. On the other hand, financial changes, mostly from budgets that have not kept up with inflation, have caused fifty-six libraries to reevaluate their level of approval plan purchases.

In addition to the survey results, ten libraries provided documents that are arranged under three broad headings: "Questions and Criteria for Evaluating Vendors," "Profiles, Descriptions, Guidelines," and "Processing and Review of Approval Plans." These documents add practical details and show internal workings of approval plan management but also presuppose prior knowledge of acquisitions and collection development terminology. The "Selected Reading List" is quite short but includes a citation for Gary J. Rossi's annotated bibliography.

For most readers, the survey will be the most interesting part of this SPEC kit, both for its statistical data and for the relatively large number of comments. The accompanying two-page SPEC Flyer offers a concise interpretation of the survey findings and may provide enough of an overview to allow many to skip reading the survey itself.—Robert P. Holley, Wayne State University, Detroit, Michigan.

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Volume 32, 1988

Compiled by Edward Swanson

General Procedures Used in Compiling the Index

The following types of entries are included:

a. authors—of articles, reviews, and letters
b. titles—of articles and of articles about which letters were published
c. subjects—of articles and of books reviewed

Subject entries for individuals are identified by “(about)”; letters are identified by “(c).”

Reviews are indexed by name of reviewer and by subject of the work reviewed, identified by “(r).” They are also listed by title under the heading “Books reviewed.”

Entries are arranged word by word following the “file-as-spelled” principle. Numbers are arranged before alphabetical characters; acronyms without internal punctuation are arranged as words.

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