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Fulfilling the Second Objective in the Online Catalog: Schemes for Organizing Author and Work Records into Usable Displays

Allyson Carlyle

An analysis of the requirements of the second objective of the catalog shows that it has two components, a retrieval component and a display component, and that it may be interpreted broadly to include related works and works about a work or author. Two schemes are investigated for their contributions to the creation of online catalog displays that meet second objective requirements. First, the catalog filing rule scheme is analyzed to show that author and work displays in card catalogs have been composed of many groups or classes of materials that may also be used to create organized displays in online catalogs. The groups used in the filing rule scheme are based on relationships among items. Second, a scheme based on Tillett’s bibliographic relationship taxonomy is proposed to discover additional types of relationships that may be used to group records in online catalog displays. Finally, a new scheme for the creation of organized displays in online catalogs is proposed. It incorporates elements from both the filing rule scheme and the bibliographic relationship taxonomy to create displays that meet the requirements of the second objective more fully than either scheme does alone.

The second objective of the catalog, adopted internationally in the Paris Principles, requires that records for particular authors and particular works be easily identified or ascertained (International Federation of Library Associations 1971). In practice, the second objective has been implemented by arranging together, or collocating, these records in catalog displays. Unfortunately, collocation is not easily obtained, particularly in online catalogs. The arrangements of records retrieved in figure 1 for a search on James Joyce’s Ulysses and in figure 2 for a search on Charles Dickens exemplify the difficulty online catalogs have in fulfilling the second objective. Although records representing works by Dickens and editions of

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Ulysses are retrieved for each search in the same set of records, they are not arranged together, nor are they arranged in a useful or organized manner. Instead, they are scattered among records for other items, some of which are related and some not. Displays such as those shown in figures 1 and 2 obscure the presence of records for particular authors and works and, further, may confuse users, leading them to abandon searches under the mistaken assumption that the library does not own the work or works they seek.

This paper identifies schemes that might be used in the online catalog for organizing author and work records to achieve the second objective of the catalog. These schemes have in common the use of groups, or classes, based on relationships among items to organize catalog displays. The terms group and class will be used synonymously here. The use of relationship-based organization of records in catalog displays has the potential to increase a user’s understanding of the nature of the items retrieved in an author or work search and to shorten long displays.

To begin, the second objective is reviewed in an effort to clarify its requirements. Next, the catalog filing rule scheme is investigated in a historical analysis to determine particular arrangements that have been used in catalogs to collocate work and author records. In this analysis, attention is paid to types of items frequently neglected in discussions of the second objective: works about a particular work or author, referred to in this paper as “works about,” and works related to a particular work. Tillett’s bibliographic relationship taxonomy (1991a) is then examined for its contribution to the construction of displays that meet the second objective. Following the investigation of these two schemes, a new, relationship-based

---

2. Blooms of Dublin / Anthony Burgess ... A musical play based on James Joyce’s Ulysses.
3. The English in the West Indies, or, The bow of Ulysses / by James Anthony Froude.
4. Flower of the mountain : for soprano solo and orchestra (1986) / Stephen Albert ... text from Joyce’s Ulysses.
5. A handlist to James Joyce’s Ulysses : a complete alphabetical index to the critical reading text
10. Odysseus / James Joyce [Swedish translation]
11. The personal memoirs of Julia Dent Grant (Mrs. Ulysses S. Grant)...
12. Songs to texts by James Joyce ... [includes song for Ulysses]
13. Ulysses / by James Joyce ; with a foreword by Morris L. Ernst ...
14. Ulysses. [by James Joyce]
15. Ulysses / James Joyce. [videorecording]
17. Ulysses, Kansas : 1:100 000-scale planimetric map ...
18. Ulysses pagefinder / compiled by Ian Gunn & Alistair McCleery
19. Ulysses, soliloquies of Molly and Leopold Bloom [sound recording]

---

Figure 1. WORK DISPLAY: Hypothetical Title Keyword Search for James Joyce’s Ulysses.
scheme for author and work displays is proposed that combines features of the filing rule scheme and the bibliographic relationships taxonomy to show the nature of items retrieved and the relationships among them more clearly than either of the other two schemes alone.

**Requirements of the Second Objective**

As formulated in the Paris Principles, the requirements of a catalog stipulated by the second objective are somewhat vague: "The catalogue should be an efficient instrument for ascertaining ... (a) which works by a particular author and (b) which editions of a particular work are in the library" (International Federation of Library Associations 1971, xiii). What exactly is required of a catalog that it "be an efficient instrument for ascertaining" the works of an author and the editions of a work? Lubetzky, who greatly influenced this statement of the objectives, stated it more clearly: "The objectives which the catalog is to serve are two: ... to relate and display together [emphasis added] the editions which a library has of a given work and the works which it has of a given author" (Lubetzky 1960, ix). Lubetzky's wording clarifies the task of the catalog; for the catalog to "be an efficient instrument," it must relate and display together work and author records. His wording also makes apparent why the second objective is called the "collocating objective."

In the manual environment, the collocating objective involves filing work and author records together, one after another. Here an alphabetical arrangement of records provides for the retrieval and display of work and author records simultaneously. In the electronic environment,

---

1. Allen, Walter Ernest, 1911-
   Six great novelists: Defoe, Fielding, Scott, Dickens, Stevenson ...
2. Almar, George.
   Oliver Twist. A serio-comic burletta, in three acts
3. Archaeology of urban America : the search for pattern and process / edited by Roy S. Dickens, Jr.
4. Carroll, John R.
   A carol for Tiny Tim : the sequel to ... Dickens' "A Christmas Carol"
5. Cronin, James Gerald, 1904-
   Ground water in Dickens and Kent Counties, Texas ...
   Best thoughts of Charles Dickens arranged in alphabetical order...
   A Christmas Carol.
   Little Dorrit.
   Oliver Twist.
    Hints to collectors of original editions of the works of Charles Dickens
11. Korg, Jacob, ed.
    London in Dickens' day.
12. Lewis, Bernard, 1908-
    About "The Old Curiosity Shop"
14. McKnight, Natalie.
    Idiots, madmen, and other prisoners in Dickens
15. Structure and process in southeastern archaeology / edited by Roy S. Dickens

**Figure 2. AUTHOR DISPLAY.** Hypothetical Author Keyword Search on Dickens for works by Charles Dickens.
however, the retrieval and display functions are separated. In an online catalog it is possible for all the editions of a work to be retrieved at the same time but not arranged together one after another or displayed together. Thus, the second objective may now be more accurately interpreted as having two requirements, a retrieval requirement and a display requirement. This paper focuses on the display requirement.

In the electronic environment, the word display can be used in a variety of ways. Discussions of online catalog displays have frequently focused on issues related to screen layout, consistency, highlighting, and other formatting issues (e.g., Online Catalog Screen Displays 1986). This paper emphasizes the organizational and intellectual aspects of display, specifically, the organization and arrangement of bibliographic records presented as a result of a search.

In formulating the requirements of the second objective precisely, another issue that must be addressed is stipulating what it is that must be collocated. The wording of the second objective does not specify what is to be treated as “the works of an author” or “the editions of a work.” Is a single person or corporate body to be considered an author, regardless of the name that person or body uses in its works? Or does a different, albeit related, “author” exist when that person or corporate body uses a different name? In practice, the cataloging rules have sometimes called for creating different “authors” if they use different names and sometimes not. For example, differences in treatment of pseudonyms can be found between the Anglo-American Cataloguing Rules, 2nd ed. (AARC2) (1978; 22.2C2) and the Anglo-American Cataloguing Rules, 2nd ed. 1988 revision (AARC2R) (rule 22.2B2). However, even when different authors have been created by the use of different names for the same person or body, practice has required the relating of the works of a single person or corporate body by the use of cross references. This practice may be interpreted as fulfilling the requirements of the second objective in that the works of an author are related, although all the works of that author have not, strictly speaking, been collocated.

For works, the picture is more complicated. More controversy has been aroused over what is to be considered to be an edition of a work than perhaps any other aspect of the second objective (for a summary of this controversy, see Yee 1994b, 1994c, 1995a, and 1995b). Seldom mentioned in discussions of this issue is that related items not considered to be editions are almost always filed together immediately following the editions of a work in an author display. Thus even related items that have not been treated as “editions of a work” per se have been included within the scope of the second objective by virtue of filing practice.

The inclusion of related works within the scope of the second objective is supported by cataloging theorists. Lubetzky, in his discussion of entry for works, includes the class of “dependent works,” which he defines as those that are “written not for their own sake, but to accompany other works upon which they depend for their interest. Such are indexes, glossaries, supplements, appendices, cadenzas, librettos, etc.” (Lubetzky 1953, 48). One assumes that he also had in mind a broad interpretation of the second objective when he made the assertion that: “[a catalog must call the reader’s] attention to related [emphasis in text] materials in the library which might be pertinent to his interest and thus help him to utilize more fully and adequately the library’s resources” (Lubetzky 1969, 10). Domanovszky’s interpretation of the scope of the second objective with respect to works (Domanovszky 1975, 98) is also broad:

... the elemental objects to be brought together by the second function must be connected with one another by the identity of a nucleus of their contents; which necessarily implies that they must have in common, at least partly, also the intellectual source of their contents. ... The relationship constituted by the common intellectual nucleus of their respective contents may vary, for instance, between a complete identity of these contents and an absolute lack of any literal [emphasis in text] identity.
Wilson (1989a) argues that although the concept of “work” should be defined narrowly, to include only those items that contain the same text, the scope of the second objective requires the catalog to assemble not only the editions of a particular work, but all the works related to that work. The term he applies to this assemblage is “literary unit,” a term first used by Pettee (1936). Wilson states (1989a, 345):

... if we wanted to claim that the texts of items assembled by the second function should be nothing but texts of the same work, it would be awkward if the elemental objects we assemble as editions of Hamlet, for instance, include commentaries, introductions, prefaces, appendices by others, in other words, much text not plausibly identified as part of the text of Hamlet ... But for literary units this is no problem. They can comfortably be seen as assembling families of texts with related though not identical content and different miscellaneous attachments that may or may not constitute separate works by other authors.

This broader class of items consisting of sets of related works has also been called “superwork,” a term first coined by Edward T. O’Neill and Elaine Svenonius.

Lubetzky includes a further class of items within the scope of the second objective: works about an author or work. In a paper written for the International Conference on Cataloguing Principles he identifies “entries under Bible where all the editions, translations, and works about [emphasis added] the Bible are found” (Lubetzky 1963, 142). It is probable that works about have seldom been mentioned in discussions of the second objective because these works are so obviously not editions per se. An interpretation of the second objective including works about within its scope is supported in cataloging filing practice, which in the last century has always required that records for works about a particular author or work file immediately following records for the authors and works themselves.

In summary, the second objective may be interpreted as requiring catalogs to retrieve as well as relate and display together (a) the works of an author—regardless of the name used by that author—and the works about that author and (b) the editions of a work, the works related to it, and works about it. In the following sections, two schemes, the filing rule scheme and the bibliographic relationship scheme, are investigated for their potential to help formulate displays that meet this objective.

**THE FILING RULE SCHEME**

The oldest scheme for meeting the second objective in display is found in catalog filing rules. Filing rules represent the most precise formulations of the second objective in that they spell out explicitly what is to be collocated in the catalog and how it is to be done. Analysis of these rules reveals the classes and subclasses of materials frequently identified for ordering work and author displays. For example, filing rules often include provisions for grouping items representing translations of a particular work and filing them after the group of items representing editions in the original language. Thus, filing rules extend the collocation requirement beyond the mere “displaying together” of work and author records to the displaying of these records in an organized and helpful manner. This is especially true for works existing in many editions and for prolific authors. In the sections on work and author filing below, the classes created by filing rules that comprise work and author displays are identified and reviewed.

In many respects, the manner in which records are arranged depends on their content. The content of records depends on cataloging practice, which is determined by the set of cataloging rules used at a given time. Because of this, any filing rules scheme must be regarded as drawing upon sets of cataloging rules as well as sets of filing rules. Although filing rules are the focus of the analysis that follows, cataloging practice is referred to when necessary to explain how specific classes are formed.

Eight filing rule codes were analyzed:

- Panizzi’s rules for the *Catalogue of Printed Books in the British Museum*, 1841
- Jewett’s rules for the *Smithsonian Re-
port on the Construction of Catalogues of Libraries, 1853 (Jewett)
- Cutter's Rules for a Dictionary Catalog, 4th ed. rewritten, 1904 (Cutter)
- A.L.A. Rules for Filing Catalog Cards, 1942 (ALA 1942)
- ALA Filing Rules, 1980 (ALA 1980)

Each code is followed by the abbreviation that will be used in the analysis below. Although rules are often provided in these codes for subarrangement of records within each class or subclass, subarrangement rules are not addressed here. Further discussion on subarrangement issues may be found in Svenonius (1988), O’Neill and Vize-Goetz (1989), and Ayres et al. (1995).

**WORK FILING**

Work displays created by codes of filing rules have, for the most part, been highly organized. Under the provisions of many codes, work records are arranged in classes and subclasses based on their relationship to the original publication of the work or their publication status; that is, whether they are published alone or with other works, or whether they are published in parts.

The class of records most frequently identified in the filing rules, and the class that almost always appears first in work displays, is *editions of the work in the original language* (Parizzi rule LXXV, Jewett rule XXXIV, Cutter rules 326–332, ALA 1942 rules 26(b) and 26(c), LC 1956, and ALA 1968 rule 27). The most recent codes of filing rules (ALA 1980 rule 2.2 and LC 1980 rule 6) do not make use of classes such as "editions in the original language" but rely instead on provisions of AACR2 and AACR2R for the use of uniform author names and uniform titles to collocate editions of a work in the original language automatically. Uniform titles, as constructed by AACR2, are purposely designed to provide elaborate groupings or classifications based on various characteristics of the items cataloged. Vellucci (1990) discusses the classificatory function of the uniform title in some depth.

Because the use of uniform title is optional (AACR2R, rule 25.1), editions of a work published under varying titles will not necessarily be displayed together. In actual practice, the use of uniform title is inconsistent and unless extraordinary efforts are made by individual libraries only some editions of a work in its original language will be displayed together, while others will be scattered alphabetically by their titles proper among records for completely different works (Carlyle 1996).

Provisions for *analytics*, that is, records for editions of works contained within collections, sometimes require that analytical records be interfiled with other edition records (Cutter rule 335, LC 1956 Aut. rule IE). An example of an analytical record would be a record for an edition of *Oliver Twist* that is published as a volume in a set of Dickens' collected works. Filing analytics with records for editions published separately makes sense, since an edition published within a collection usually contains text identical to the text in an edition published separately. However, in some codes analytics are interfiled with unlike materials such as related works (ALA 1968 rules 26, 27) or are filed together as a separate class of material (ALA 1942 rule 25(7b)). One assumes that in codes that do not provide for analytics, the filing of these records is left to the discretion of the filler or the policy of the individual institution. In ALA 1980 and LC 1980, analytics file as is; that is, the filing of these records depends on the presence and construction of analytical entries, which, in turn, allow for the interfiling of editions and related works in the same display.

A group of records representing *translations of the original edition* often follows the group of records for editions in the original language (Parizzi rule LXXV, Jewett rule XXXIV, Cutter rule 331, ALA 1942 rule 25(7b), 26(b) and 26(c), LC 1956 Aut. rule 1G, ALA 1968 rule 27). Occasionally provisions are made for translations to be filed under their titles.
proper, treating them as if they were completely separate works unrelated to any other of the author's works (ALA 1942 rule 25, ALA 1968 rule 26). Using ALA 1980 or LC 1980, translations would file after editions in the original language only if appropriately constructed uniform titles were used. If no uniform title were used, they would file as if they were separate and unrelated works.

In early codes, rules were created for special classes of materials closely related to the original work. Panizzi (rule LXXV) and Jewett (rule XXXIV) make arrangements for items containing the work both in the original language and in translation to be filed following editions in the original language. Many of the codes contain provisions for filing records for selections or portions of a work published separately (Panizzi rule LXXV; Jewett rule XXXIV; Cutter rule 326; ALA 1968 rule 27, footnote 37; and ALA 1980 and LC 1980 if appropriate uniform titles are used). ALA 1942 (rule 26(b)) specifies that records for manuscripts of a work file before records for editions in the original language.

Criticisms and other works about a work—called here works about—have also been grouped together as an integral part of the work display, following records more closely related to the original work. In Panizzi (rule LXXV), cross-references were filed at the beginning of a file, before any actual records were displayed. Although Panizzi rule LXXV does not explicitly mention works about, examples in this volume—see, for example, the listing under Aristotle's Logic on pp.330–332—make it clear that references to works about file before editions of the work. Jewett (rule XXXVI) filed cross-references after all other pertinent records had been filed. In all other codes, including ALA 1980 and LC 1980, works about file together in a group following all the other records in a work display (Cutter rule 334, ALA 1942 rules 25, 26(a) and 26(b), LC 1956 Aut. rule III, ALA 1968 rules 26 and 27, ALA 1980 rule 2.2 and LC 1980 rule 6). ALA 1942 (rules 25 and 26(b)) and ALA 1968 (rule 27) make provisions for a criticism of a particular edition, translation, or part to file immediately after that particular edition, translation, or part.

Treatment of related works in the filing rules is somewhat difficult to discover. The related work category contains items that have many different relationships to the original edition. Examples of related works include sequels, supplements, indexes, concordances, screenplays, librettos, and subseries (AACR2R, rule 21.28A1.). Related works often have a main entry different from the main entry of the work to which they are related, but are given an added entry to show the relationship to the original. Related works have only within the last 50 years been identified and named as a particular class of materials in cataloging (American Library Association 1949). However, works of this type have, in practice, almost always been incorporated into work displays, often interfiled with works about. Some of the difficulties of ascertaining the treatment of related works in the codes are that they have either not been mentioned at all, they have been treated as equivalent to editions, or they have not been treated as a class of materials per se but referred to in the context of an added entry. For example, LC 1956 states: “If a book has some connection with another author's work, but is not a criticism of it and does not include the original text, an added entry is often made under that author. In that case the title of the work in question is included as part of the added entry heading. As an added entry the card is filed after the texts of the work and before the criticism (or subject) cards for that work” (LC 1956, 19).

In ALA 1968, related work added entries are formally identified as "author-title added entries" and provisions for filing them state that they are to interfile with analytic entries, which have the same form, and follow edition records and precede records for works about (rule 26(b) and 27). Again, this creates a class composed of two very different types of materials, analytical editions and related works. In ALA 1980 and LC 1980, author-title added entries, now called name-title added entries, are treated as equivalent to main entries (rules 2 and 6, respectively). Thus, in catalogs following these rules,
work displays are even more confusing because related work records interfile among edition records and analytical edition records.

Special treatment is accorded works represented by very large numbers of records in several of the codes, providing for even more classes of materials, thus creating even more highly organized displays. Panizzi (rule LXXIX), and Jewett following him (rule XXXVII), specify rules solely for arranging records for the Bible. By the time ALA 1942 was published, special rules were included for "anonymous classics" as well as the Bible (rules 28–30). LC 1956 (anonymous classics rule) and ALA 1968 (rules 29–30) also contained special provisions for filing anonymous classics and the Bible. Again, ALA 1980 and LC 1980 provide for organized arrangements for all works only insofar as the correct uniform title headings are used in individual records.

**AUTHOR FILING**

Author displays, like work displays, have usually been composed of various classes of author records. All filing codes provide for grouping works by an author together. However, prior to 1968, the major codes divided the works of an author into various subclasses, particularly for classic or voluminous authors. In Panizzi (rule LXX), Jewett (rule XXXIV), Cutter (rule 326), ALA 1942 (rules 26(a), 26(b), and 26(c) for classic and voluminous authors), and LC 1956 (Aut. rule IA), the first class of works by an author consists of complete works of an author. Some of the codes further subdivide this class into complete works in the original language, complete works in the original language and in translation, and complete works in translation only (Panizzi rules LXX–LXXII, Jewett rule XXXIV), although rule 26(a) in ALA 1942 stipulates two categories only: complete works in the original language and complete works in translation.

Following complete works is a class containing selected works of an author (Panizzi rule LXXIII; Jewett rule XXXIV; Cutter rule 326; ALA 1942 rules 26(a), 26(b), and 26(c)). LC 1956 (Aut. rule I) combines complete and selected works into a single class. As with complete works, selected works might be subarranged into various groups based on language of text. Catalogs following ALA 1968 (rule 27 for organized author arrangement), ALA 1980, or LC 1980 would create author displays that grouped complete works and selected works only if uniform titles were used. Uniform titles create groups containing complete works as well as groups containing specific types of works, for example, plays, essays, poems, etc. by use of collective uniform titles, for example, "Works" or "Essays" (Anglo-American Cataloguing Rules (1967) rule 107; AACR2R rules 25.8 and 25.10). Actual catalog displays from early catalogs also reveal classes containing specific types of works in displays for various prolific authors. For example, the Shakespeare display in the Catalogue of the Library of the Boston Athenæum features the special classes "Separate Plays" and "Poems" which file after "Selections" (Boston Athenæum 1874–1880, 2707–2708).

In ALA 1942, selected works are combined with selections from a single work or from various works (rule 26(a)). In other codes, selections from a single work or various works are grouped together separately and filed either before single works of the author (Panizzi rule LXXIV, Jewett rule XXXIV) or after (ALA 1942 rule 26(b) and 26(c)). Again, the filing of selections from a single work or from various works in ALA 1968, ALA 1980, and LC 1980 depends on whether or not uniform titles containing the collective title "Selections" were used in the record.

Single works by an author are treated as discussed in the section on work filing above. However, an early practice not mentioned above distinguished works by an author as main entry and the author as joint author, illustrator, editor, etc. (see discussion in Cutter 1904, 119). LC 1956 required the interfiling of author as main entry and author as joint entry, but created a separate group for the author as compiler, joint compiler, editor, etc. (Aut. rule IIa). Some online catalogs containing cataloging records with relator designations following the author name in the author heading, for example, "ed.,” create
separate groups for these records because filing programs sort on relator terms. Relator terms are seldom used today; thus such groups might be misleading to catalog users because they give the impression that all the works edited, etc., by an author might be found in such groups.

Sometimes displayed as a separate group are *spurious and doubtful works*. ALA 1942 explicitly mentions these works, requiring that they file after the known works of the author (rule 26(b)). Because the *A.L.A. Cataloging Rules for Author and Title Entries* (American Library Association 1949) and previous sets of cataloging rules stipulate use of a form subdivision "spurious and doubtful works" in an author heading for works of this nature, those catalogs constructed by such rules would group these works automatically by following the rules for alphabetical filing. Panizzi’s last author grouping contains “works not written by the person but under whose name they will be cataloged” (rule LXXVII), which would perhaps have contained spurious and doubtful works if they existed.

The last class of materials common to all the codes is *works about* the author, including both biographies and criticisms. Works about usually file last in an author display (Cutter rule 326, ALA 1942 rules 25, 26(a) and 26(b), LC 1956 Aut. rule III, ALA 1968 rules 26 and 27, ALA 1980 rule 1980 and LC 1980 rule 6). In actual catalogs, works about can outnumber the actual works of an author, particularly works about classic and voluminous authors, and may thus comprise a significant portion of an author display.

An unusual arrangement is stipulated in ALA 1942 rule 26(c), one of the optional rules for arrangement of classic and voluminous authors. It requires that texts of all types by the author in the original language be filed in one group, followed by groups of texts in various translations filed by language. Each of these two major groups is subdivided into the following classes: complete works, selected works, single works, spurious and doubtful works, and selections. These two major groups are followed by three categories of works about: biography and general criticism, criticism of single works, and other subject entries for the author.

In later codes, rules for the creation of author displays are quite simple, specifying two classes only: works by the author and works about the author (ALA 1942 rule 25, ALA 1968 rule 26, ALA 1980 rule 2.2, and LC 1980 rule 6). These displays separate groups of work records from works about the work (criticisms, for example). In addition, as mentioned above, if uniform titles are not used, such displays do not collocate the editions of a work because they separate records for editions that have varying titles proper or translated titles and they interfile records for related works among edition records. In ALA 1942 and ALA 1968, the simple by/about display was recommended for nonclassic or nonvoluminous authors only, presumably because these displays would consist of few records.

Finally, *cross-reference* records are often used in author displays. See references are used to refer users from various forms of an author’s name. See also references are used to refer users from various names used by the same author. In a listing of titles under author name, see references can be made from variant titles of an author’s work to its uniform title (e.g., AACR2 rule 26.4; illustrated in fig. 3 on lines 3 and 7). This type of see reference was used in early catalogs when no records were filed under variant titles and all records were filed under uniform titles. Such see references are still sometimes used to direct users to uniform titles. However, few online catalogs are able to display title references and, mimicking the card environment, display them under author name only and not under title as well. Furthermore, few catalogs, if any, follow early catalog practice and display the see reference instead of records under the variant title.

Those online catalogs displaying title see references frequently display records containing the same variant title in proximity to the title reference, sending a potentially confusing message to the users (see lines 3, 4, 6, 7, and 8 in fig. 3). In addition, the title that they see on the screen usually represents records for related
works (see line 6 in fig. 3); records for editions of the work they are actually seeking are buried in the group of records that appears under the author name alone (see line 2 in fig. 3). See and see also references can also be used to direct users to parts of works cataloged independently (for example, AACR2R rule 26.4B2) and to direct users from related work entries to the work to which they are related (for example, AACR2R rule 26.4C), respectively.

**FILING RULES DISCUSSION**

All of the codes of filing rules, including ALA 1980 and LC 1980, require the formation of groups of work and author records based on their relationships to each other. Groups are defined because the items in them share specific relationships to each other. For example, in the translations group, all items share the same relationship to the original in that they have all been translated into a language different from the language of the original. The extent to which grouping based on specific relationships has occurred in the display of works and authors has frequently depended on the number of records associated with them. In the words of ALA 1968 (113):

Arrangement of all works by title page title is suitable only for a small collection with relatively few titles under an author. An organized arrangement should be introduced in situations where the alphabetic order becomes difficult to consult because of the number and character of the titles, editions, translations, etc., as under classic and voluminous authors . . .

Large files have always presented a problem for catalog users, and grouped arrangements have been used as means of solving this problem. However, if the groups used in ordering are not clearly marked, the resultant arrangements may be confusing to users, which was noted by Jackson in his study of catalog use (1958). The dangers of grouped arrangements in the card environment were identified early on. Cutter, with his usual perspicuity, noted (rule 326):

... practice hitherto has been to arrange entries by joint authors after the works written by the first author alone ... but although it is pleasing to a classifying mind, it is practically objectionable because a reader, not knowing that the book he is looking for is a joint production, and not finding it in the first series of titles, might suppose that it is not in the library. This danger is greatest in a card catalog, where it entirely overweights the somewhat visionary advantage of the separate arrangement. The arrangement of a card catalog should be as simple as possible, because the reader having only one card at a time under his eye can not easily see what the arrangement is. On the printed page, where he takes in many titles at a glance, more classification can be ventured upon; there the danger is confined to the more voluminous authors; where there are few titles the consulter will read them all and so will not miss any.

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**Search on: DICKENS CHARLES**

**Line** | **Entries** | **Author/Title**
---|---|---
1 | 1 | Dickens, Charles, 1719-1793.
2 | 283 | Dickens, Charles, 1812-1870.
3 | 0 | Dickens, Charles, 1812-1870. Annotated Christmas carol.
7 | 0 | Dickens, Charles, 1812-1870. Christmas carol in prose.

**Figure 3. Work Cross-Reference Display Under Author Name.**
One solution to the problem of users being unaware of grouped arrangements was to insert guide cards to mark the beginning of record groupings. However, it was never widely implemented. Thus individually alphabetized groups of records were filed in card catalog work and author displays, and there was seldom any indication of when these classes began or ended or what they represented.

Librarians frequently criticized these highly organized, classified arrangements, for the reasons identified by Cutter (for example, Scheerer 1959). In addition, when early online catalogs were developed, it was discovered that contemporary codes of filing rules (LC 1956 and ALA 1968) relied heavily on human interpretation and contained many exceptions, attributes with which computers were unable to cope (Wellisch 1983). The argument was made that “filing should be a purely mechanical operation which can be reduced to a straightforward arrangement of sorts and nulls. The filer or program should not be expected to expand or interpret for filing purposes” (Hines 1963, 8–9). Those advancing this argument prevailed, and ALA 1980 and LC 1980 were developed to accommodate the inflexibility of the computer by simplifying the filing process (ALA 1980, 1–3; LC 1980, 2–3; Anderson 1982).

As mentioned earlier, ALA 1980 and LC 1980 reduced the number of classes of records in work and author displays to two: editions or works, including related works, which are interfiled, and works about. However, whether or not these classes were formed depended almost entirely on the presence of uniform author and title headings. In any case, the reduction in the number of classes has not eliminated the “large file” problem, which continues to haunt catalog users (see, for example, Wiberley, Daugherty, and Danowski 1995). The online catalog’s inability to demonstrate relationships among records has been suggested as contributing to the large file problem (Carlyle 1996). This inability stems in part from the abandonment, by codes of filing rules, of classified displays in which relationships among items can be shown. Abandoning this method of showing relationships is even more serious considering that current research advocates an even more detailed organization of relationships among items in the catalog (for example, Svenonius 1988, Tillet 1991a, Smiraglia 1992, Leazer and Smiraglia 1996).

**The Bibliographic Relationships Scheme**

A second scheme that may be used to guide the creation of displays that meet the second objective for works is based on Tillet’s taxonomy of bibliographic relationships (1991a), which was developed to facilitate the creation of a conceptual model of the catalog. Tillet, in her relationship taxonomy, spells out the types of relationships that exist among works. Although the taxonomy was not necessarily intended as a scheme for creating online catalog displays of works, it does define relationships that might be used to group items related to works in the catalog. The groupings that are suggested by Tillet’s bibliographic relationships are first reviewed and then compared to the traditional groups created by filing and cataloging rules (see Tillet 1991b for a complete review of the treatment of bibliographic relationships in cataloging rules).

Tillet defines the equivalence relationship first. Equivalent items share intellectual and artistic content as well as authorship, and her examples include copies, facsimiles, and photocopies. A grouping of records based on the equivalence relationship can be regarded as a subset of the filing group “editions of the work in the original language.” However, the original-language editions group also includes editions that have the same content and authorship but might vary in other respects; for example, they might have different publishers, editors, or illustrators. In addition, the original editions filing group might contain items that do not share identical intellectual and artistic content, for example, revisions and abridgments.

Next, the derivative relationship exists between any item and another item that has been derived from it. The range of items sharing the derivative relationship extends from items that exhibit only small differences in intellectual and artistic content to
those that have very little intellectual and artistic content in common. For example, it may hold between editions that are nearly identical, as between an original edition and a corrected edition published by the same publisher and, at the other extreme, between a textual edition of *A Christmas Carol* and a French pop-up book version, a video or audio performance, or a *A Christmas Carol* card game.

Smiraglia (1992, 28) refines derivative relationships into various subrelationships. Smiraglia’s seven derivative subrelationships include: simultaneous derivations, successive derivations, translations, amplifications, extractions, adaptations, and performances. Some of his subrelationships have been slightly modified or renamed in the following discussion to facilitate comparison to filing rules groupings. Because the number of items that can fall into the derivative relationship category is so large, Smiraglia’s subrelationships have the potential to be especially useful for grouping items in display.

Revisions, which Smiraglia calls “successive derivations,” consist of items that have been revised. Another way of looking at revisions is to say that they have been changed in such a way as to alter the intellectual and artistic content of the original without changing its intellectual and artistic intent, form, or format. In this paper, a distinction is drawn between content, on the one hand, and intent, form, and format, on the other, because it is seen as being central to making distinctions between different types of derivations. Intellectual and artistic intent might include intended audience, purpose, point of view, or discipline represented by a work. Form includes internal structure; for example, textual forms include outlines, prose, plays, poetry, etc. Format includes external or physical structure, for example, sound recordings, videorecordings, books, etc. It must be noted that some changes in format do not indicate a derivation, in particular, those that replicate the conditions under which the original item is experienced (Helmer 1987). For instance, editions appearing on audiocassettes and compact discs, or editions appearing in book format and microform, could be considered to be equivalent. With this exception noted, a revision may thus be defined as resulting from a change in intellectual or artistic content without alterations in the intent, form, or format of the original.

Revisions have been included in two different groups in filing practice depending on authorship conditions and titles used. If authorship conditions and title of the original edition have been preserved, then revisions have normally been grouped with the original editions, although treatment in this area has varied in cataloging history. In AACR2R, if authorship conditions or title have changed, then revisions have been treated as new works. Name-title added entries are not created for all revisions treated as new works, and thus records for these revisions have not been filed with records for the original consistently.

Revisions can be contrasted to adaptations, which alter the intellectual and artistic intent, form, or format of an original edition as well as its content. Smiraglia’s examples include simplifications, which may result from the desire to present the work to a different audience, and screenplays adapted from prose works, which change the internal structure of a work and may, in addition, include various changes of intent. Other changes in artistic intent, form, and format include parodies, dramatizations, free translations, and reproductions of artworks. Yee (1994c, 1995a) identifies many types of items that would be included here in parts 2 and 3 of her review of the concept of “work.” We might also wish to add here another of Smiraglia’s derivative subrelationships, performance, sound or video, as a type of adaptation.

Most adaptations, including performances, have been treated as new works in traditional cataloging practice because they involve a change in authorship conditions. A notable exception is music; performances of musical works have been treated as editions of the original work. In practice, treatment of adaptations is similar to that of revisions involving a change in authorship conditions; name-title added entries may or may not be required, and thus records for adaptations and performances may or may not be grouped with records for the original.
Smiraglia also identifies translations and extractions as separate types of derivations. Translations have always been identified in catalog displays and, as a group, are identical to the group identified in traditional practice. Smiraglia does not address the display issue, but subgrouping by language for display purposes, consonant with filing rule practice, is a logical extension of the translation grouping.

Extractions include abridgments, condensations, and excerpts. Smiraglia includes excerpts in the extractions subrelationship. Excerpts might also be considered to bear a type of whole-part relationship to an original. The whole-part relationship is discussed below. Extractions have often been treated as editions, or as equivalents, in traditional cataloging practice (Yee 1994c), with the exception of abridgments that are seen as the work of the abridger, which are treated as new works related to the original and given name-title added entries. As a result, records for extractions have often been interfiled with records for original editions in traditional filing practice.

Amplifications of a work occur when a new work has been created or produced to amplify, add to, or extend the original in some respect (Smiraglia 1992). One may or may not wish to regard amplifications as a type of derivation. A case might be made for amplifications to be on a parallel footing with Tillett's other bibliographic relationships. Also, amplifications subsume a large part of Tillett's accompanying relationship, which, in this paper, is not being regarded as a separate bibliographic relationship (see discussion below). The new work may or may not be published with the original. Examples that Smiraglia gives include illustrated texts, musical settings, and concordances. In traditional cataloging practice, amplifications published with the original have most often been grouped with records for the original work as if they were identical to them. Amplifications published separately are usually treated as different works and related with a name-title added entry. Records for these items are then frequently interfiled with records for the original work.

The whole-part relationship holds "between a component part of a bibliographic item or work and its whole" (Tillett 1991a, 156). Current cataloging practice calls for the identification of parts or selections using either a uniform title (AACR2R, rule 25.6) or a note identifying the host item. If a uniform title is not used, records for parts can be arranged randomly among records for the whole item; in some instances they can interfile among totally irrelevant records. If a uniform title is used, separate groupings are created for each part because the part name is included as an extension of the uniform title.

A whole work that is published as part of a collection can be identified with a name-title added entry and, in most filing codes, interfiled with other records for the work, but the practice of assigning name-title added entries is limited to collections comprised of three or fewer separate items (AACR2R, rule 21.7B1). Sometimes separate works are identified in contents notes only, and frequently they are not identified at all. As a result, bibliographic records display the whole-part relationship inconsistently.

The sequential relationship holds between an item and other items following or preceding it. This relationship also has been treated in a variety of ways in cataloging practice. For serial title changes, practice has varied from creating a single record with added title entries for the various titles used, to creating a succession of entries representing the various titles used with linking added entries. Recently successive entry has been used. Use of successive entry for serials implies that serials whose titles have changed are different works. However, added entries for an earlier and a later title are mandated, thereby partially grouping records under both old and new titles in the catalog and treating them as related works.

Items exemplifying other types of sequential relationships—in particular, fiction sequels—are rarely identified in cataloging practice. If fiction sequels are identified, identification is usually limited to a note and not an added entry. In this way the two schemes differ in the groupings that would be created in a work dis-
play; the traditional filing rules scheme would place far fewer items in this category than the bibliographic relationships scheme.

The *descriptive relationship* translates more or less into the class that has been referred to here as works about a particular work. Works in this relationship are exemplified by criticisms, commentaries, and reviews. Cataloging practice prescribes that subject added entries be included in records for items bearing this relationship, and filing practice has called for this group of items to be filed together at the end of a file of work records.

The *shared characteristic relationship* is found among any two items that share an identical characteristic, such as an author or work name. In filing practice, records are grouped when they share identical access points, and thus groupings created by this relationship would be identical to those created by filing rules so long as the shared characteristic has been given an access point. Groupings would not be made in a catalog for characteristics not given access points, although an online catalog that has keyword searching of all fields makes such groupings possible if the characteristics appear in the bibliographic records.

Tillett describes the *accompanying relationship* as holding between two or more items that are published together or are meant to be used together—between an item and another item accompanying it. I would argue that there is no need for a separate category for accompanying relationships, because although accompanying materials are related, they always share one or more of the relationships described above.

All of the examples that Tillett gives of items of the accompanying relationship can be placed into one of the bibliographic relationship categories described above. Her examples include a predominant item and a lesser item, e.g., a text and its supplements. A supplement to a text might be regarded either as an amplification or a sequel, depending on the nature of the supplement. Other predominant items accompanied by lesser items, such as a geography text accompanied by an atlas, a children's book accompanied by a doll, or a computer file accompanied by a manual, could all be seen as amplifications. Items that provide access to other items, Lubetzky's "dependent works" category, including concordances, indexes, and catalogs, might also be regarded as a special type of amplification. Tillett's last example, the separate components of a kit, do not necessarily represent a bibliographic relationship in that they, like chapters in a book, comprise the item. If the individual components of a kit are separated for some reason, then the whole-part relationship might be appropriately applied to describe the relationship of the part to the whole and vice versa.

**Problems in the Creation of Organized Author and Work Displays**

Each of the schemes discussed above, the filing rules scheme and the bibliographic relationships scheme, falls somewhat short of creating displays that fulfill the second objective because they do not identify clearly the nature of, and relationships among, items retrieved in a search for an author or work. In this section, the filing rules scheme and the bibliographic relationships scheme are evaluated with respect to their limitations in guiding the creation of catalog displays. The effect of keyword searching on the creation of relationship-based displays is analyzed as well.

**Evaluation of the Filing Rules Scheme**

One critical weakness of the filing rules scheme is that it depends on record content for grouping. This is unsatisfactory for two reasons. First, record content is determined by cataloging rules, and sometimes the cataloging rules do not require the necessary content. For example, because AACR2R and earlier codes have not required the use of uniform title, many records that are related cannot be grouped together in catalog displays because they lack a uniform title. Even items that share identical intellectual and artistic content might be treated as different
works because uniform titles are not used. Another example is parodies; AACR2R does not require a name-title added entry for the work parodied, and as a result, the relationship between a parody and the work parodied is not shown.

A second reason that dependence on record content for grouping is unsatisfactory is that online catalogs might misfile or ignore catalog headings in filing. When catalog headings that are intended to group records together are misfiled or ignored, the records representing particular works and authors are scattered. For example, name-title added entries are frequently filed not as two separate headings, a name and a title, but as a single heading (see line 6, fig. 3). Another example is filing the works of an author under titles proper instead of uniform titles. Although these problems might be remedied by corrected programming, thus far many online catalog designers do not seem to be inclined to move in this direction.

Another weakness of the filing rules scheme, particularly when viewed in the context of works and the bibliographic relationship scheme, is that it does not sufficiently distinguish among items that bear different relationships to each other, treating as equivalent items that are, in fact, quite different. As Wilson has pointed out on numerous occasions (e.g., 1983), the traditional filing rules scheme does not identify items that contain identical texts. Even when editions are grouped together, it is up to the user to look carefully at each bibliographic record to determine which one, for example, represents the most recent edition. The greatest failure to make distinctions among different types of items is in the group of items that are assigned name-title added entries. These items might bear equivalent, derivative, or sequential relationships to a work. Currently only one distinction can be made among these items. The name-title added entry provided by the MARC format allows two groups to be distinguished: a group of related works, which includes items bearing derivative and sequential relationships, and a group of analytics, which includes items bearing an equivalence relationship.

**Evaluation of the Bibliographic Relationship Scheme**

One of the major weaknesses of the bibliographic relationship scheme is that the intellectual and artistic distance of items bearing a bibliographic relationship to an original edition is not taken into account, nor are authorship conditions. Intellectual and artistic distance can be viewed in part as changes in a work that involve its intent, form, or format, as discussed above. Authorship conditions, particularly primary authorship, inherent in main entry decisions, are closely related to such changes in that a change in main entry indicates that an item has moved a significant distance away from the original.

Traditional cataloging practice has generally divided the derivative relationship into two groups based on authorship conditions represented in the items. This division might be seen as an indication of the distance of a particular derived item from the original. In the first group are those items whose authorship is represented as being the same or nearly the same as the authorship for original item, for example, an edition updated or revised by the original author(s). Changes in subsidiary authorship—for instance, changes in illustrators or the addition of translators—have not been considered to change significantly the authorship conditions of the original edition.

In the second group are those items whose authorship is represented as being different from the original, for example, an adaptation for children by a new author, an edition completely revised by another author, or an adaptation into another format. While we might wish to make more distinctions than these two, it would be just as unwise to group all items sharing the derivative relationship together without making distinctions based on distance from original or authorship conditions. The subgroupings of the derivative relationship suggested by Smiraglia remedy much of this problem, but even so, it may be misleading to users if all of these subgroupings appeared together in a work display as a single class.

Several aspects of the bibliographic relationship scheme could be modified to
make it show the nature of items in a work display more clearly. The equivalence relationship as set forth by Tillett does not distinguish between items sharing identical text or intellectual content only and items sharing identical or nearly identical title page representation as well as identical content. For example, it does not distinguish the relationship between an item and a photocopy of that item (items that share identical or nearly identical title page representation, paging, and content) and the relationship between an item published by one publisher and an item with identical content published by another publisher (items that share identical content only). Tillett's list of examples suggests that she understands the equivalence relationship to hold between items sharing identical title page representation, paging, and intellectual content. Yee (1994a) has recommended that these items be considered near equivalents and be described by the same bibliographic record, with an indication of changes in format or other minor changes. With respect to items sharing identical intellectual content only, Wilson (1989b) has argued that our conception of "work" should include only these items, which he calls texts. It makes sense to refine Tillett's equivalence relationship in display along these lines by incorporating near equivalents into the display of a single bibliographic record, as recommended by Yee, and by grouping items that share identical intellectual content, regardless of title page representation, as suggested by Wilson.

Smiraglia identifies a type of relationship—the "simultaneous derivation"—that might be helpful to treat as a subtype of equivalence relationship (Smiraglia 1992, 28). This relationship is called here an orthographic modification. Editions of an English work published in the United States might include differences in spelling, and a textual work might be published in large print or Braille. Changes such as these do not affect the intellectual or artistic content of a work. Orthographic modifications have never been classed separately in any set of filing rules, but have been treated as equivalent editions. When a work has many orthographic modifications, this relationship might be an important means of helping users identify quickly the items they need.

It might also be useful, depending on the work displayed, to analyze some of Tillett's bibliographic relationships into subrelationships, much the way Smiraglia has done with the derivative relationship. For example, items sharing whole-part relationships could be divided into a group of items in which the whole appears with other items in a collection and then into another group of items that contains parts only. Another example is the sequential relationship; items sharing the sequential relationship could be grouped according to whether they appear earlier in a sequence or later than the work displayed. Bernhardt (1988) suggests this type of display for serials that have undergone title changes. The problem of displaying sequels and serials is analogous to the problem of relating records for corporate authors or other authors represented under two or more different and sequential names. Bernhardt's proposal for alternative serial displays provides a blueprint for clarifying displays of sequentially related author names in the catalog as well.

**KEYWORD SEARCHING AND DISPLAY**

Any implementation of the second objective is challenged in the online environment by a phenomenon that could not have existed in the manual environment, which is the retrieval of records for items that are related to a particular work or author but that have not been explicitly linked in cataloging practice to that work or author. Although these items lack deliberate cataloging links to the related work or author, they are retrieved in keyword searches (that are assumed to have Boolean functionality) because relevant uncontrolled names or titles are embedded within access fields or are present in nonaccess fields (see items 1, 9, and 12 in fig. 1 and 1 and 11 in fig. 2). Items in this group are of two types. First are items that, for a variety of reasons supported by cataloging rules, lack deliberate links but are, in fact, editions, related works, or works about the work or author sought (unlinked works or authors). Second are items that lack de-
liberate links to a particular work or author because they bear only a peripheral relationship to that work or author (peripherally related works). Peripherally related works include those that devote a small percentage of content to a particular author or work or those that mention a particular author or work in passing. In keyword searches for prolific authors and highly manifested works, many records of both types might be retrieved.

In principle, all records for particular authors and works should be grouped according to the second objective. However, for various reasons, cataloging rules and practice have not required the creation of explicit links in every record for items that incorporate the work of an author or an edition of a work. For example, if an edition of a work is published in a collection of four or more works (AACR2R rule 21.7) or if a translator or illustrator does not fulfill basic added entry requirements (AACR2R rule 21.30K), explicit linking is not required. The reasons for this are primarily economic; the price of explicit links is high and as a result, the number of links has been limited.

Fortunately, some unlinked records can be identified automatically. For example, many editions of works are contained in single-volume collections of an author's works. In many records for these collections, the author's name appears in the main entry field and titles of the contained works appear in the contents note field. In these cases, records for single-volume collections containing editions of single works could be automatically identified and grouped with other equivalent items. Unfortunately, not all unlinked records are so easily identified. However, many of those that are not could be grouped with peripherally related items and thus become somewhat accessible to catalog users.

Any argument to include peripherally related items in the second objective with other items more closely related to a particular work or author can be challenged. Nonetheless, it is the case that these items are retrieved and displayed in keyword searches, that catalog users see them in the set of retrieved records, and that their relationship to the work or author sought, however slight, will be recognized. To include these items formally within the scope of the second objective would require a change in current practice such that catalogers would be required to assign explicit links to all items bearing any relationship, no matter how slight, to an author or work. Such a move is undoubtedly impossible given economic constraints. Further, and perhaps more important, it may not be desirable to water down the groups of closely related items with items that are more distantly related to a work or author sought. On the other hand, to group these items with totally unrelated items might also be undesirable given that they will be seen and might be of interest to some catalog users.

A compromise position would take advantage of existing computer technology and would group peripherally related items at the end of an author or work display automatically. For example, once all the records containing explicit links for Joyce's *Ulysses* were organized, the remaining records could be searched using the terms "ulysse" and "joyce." Those records that contained both terms could then be grouped into the peripherally related records category. Because this grouping would rely on the existence of uncontrolled author names and titles, it would not be perfect, nor would all peripherally related records be assembled. However, labels identifying classes of peripherally related and unrelated records in a catalog display could indicate the uncertainty of the classification. A message such as "Items probably related to [name of work or author]" could identify those items automatically identified as peripherally related, while the group of unrelated records could be accompanied by the message "Items that may or may not be related to [name of work or author]."

**The Organized Display Scheme: A New Scheme for Fulfilling the Second Objective in the Online Catalog**

The preceding review and analysis of the filing rule and bibliographic relationship schemes lay the groundwork for the development of a scheme that fulfills the sec-
ond objective to a greater extent than has been accomplished before. This new scheme, the organized display scheme, combines the strengths of both of the earlier schemes to give users a precise indication of the nature of items retrieved and the relationships among them by taking into account both the types of relationship present among items as well as the distance of an item from the original. It also acknowledges the presence of peripheral and unlinked items retrieved in a keyword environment.

The emphasis in this paper has been on the identification of groups or classes of items that share specific relationships. The reason for this was to facilitate the creation of summary displays in which all the records for a particular work or a particular author could be displayed on a single screen. Evidence exists that some catalog users, when confronted with large sets of retrieved items, leave the catalog without consulting a single record (Wiberley, Daugherty, and Danowski 1995). The compression of large retrieval sets of work and author records onto single screens has the potential to relieve this problem of overload.

In figures 4 and 5, summary work and author displays are suggested. These summaries are suggestions only, because different works are manifested in different ways and would be served best by customized displays. For example, some works have been adapted many times and have many related works associated with them and some do not. If few adapted and related works are associated with a particular work, then that grouping could appear as a single selection under “Editions” and not as a major grouping with specified subgroupings. Likewise, if many items in a subgrouping existed, for example, amplifications of a particular work, it would be useful to divide that group into subgroups, perhaps grouping all of the texts that have been illustrated and then all of the texts that have been published with commentaries, and so forth. Another reason that the work display in figure 4 is only a suggestion is that it assumes that the original edition is a text; originals that are not texts would require slightly different summary displays.

In the summary work display (figure 4), those items whose intellectual and artistic content are close or identical to the original work—in other words, the items that are normally given the same main entry—appear together in the first major grouping of items on the screen. Items sharing the same text appear in the first...
five subgroups, with revisions and translations appearing next, and finally items that represent parts only. In the next major grouping are those items whose intellectual and artistic content are further from the original by virtue of the fact that their intellectual or artistic intent, form, and format have been altered. These items have normally been given main entries different from the original. The sub-groupings in this category include videorecordings and musical and computer versions. A miscellaneous category is included for items that might not fit any of the other adaptations and related works subgroupings exactly.

The summary author display (figure 5) is based entirely on the filing rule scheme, since the bibliographic relationship scheme applies to works only. Like work displays, displays for individual authors could be customized according to the relationships among the items retrieved. Few authors, for example, would have any items appearing in a "spurious and doubtful work" category, and it would seldom be needed in an author display.

One of the limitations of summary displays such as the ones suggested here is that relationships between individual items that are different from their relationship to the original are hidden. For example, a work about another work might be about a particular part of it only, or a translation might have been made of a particular revised edition. In a sophisticated online catalog using individual item linking, such as hypertext-type linking, items that share relationships to each other might be linked individually at the record level; that is, when one of the items sharing the relationship is displayed, the link to the other record might be highlighted, and users might go back and forth between these items. These links could appear at the record level only, and not at the summary display level.

MOVING TOWARD NEW SCHEMES FOR DISPLAY

Although it is not within the scope of this paper to outline how a new display scheme could be implemented, it will be briefly addressed here. It is well within the capacity of current computer technology to create displays that identify clearly various classes of materials. Such displays could be designed using various approaches, for example, using graphical, hierarchical tree-structures to illustrate the types of materials retrieved in a search. The computer could also create permanent links among records so that every record would always be linked to the entire set of records related to it. An advantage of the electronic environment is that it can provide relationship-based displays without the hazards such displays presented in the card environment; that is, users would always be able to see a summary screen that identifies clearly the classes of related items retrieved.

Although it is within the power of the computer to create relationship-based displays, two major obstacles must be overcome first: the inadequate identification of relationships in existing cataloging records and the limitations of current cataloging practice and the MARC format. To eliminate the first obstacle it would be necessary to identify existing cataloging records that lack appropriate links and then upgrade them by adding those links. It is likely that upgrading existing records would be prohibitively expensive. A compromise would be to upgrade cataloging for only those records associated with works and authors represented by large numbers of records and sought frequently by catalog users. This worst-case approach, while far from ideal, would lower the cost of upgrading current records by limiting its application to those works and authors that are both sought frequently by catalog users and are most likely to result in long, disorganized displays.

Eliminating the second obstacle, the limitations of cataloging practice and the MARC format, is more of a challenge. As noted several times in this paper, AACR2R does not identify relationships between items consistently. AACR2R, like many of the cataloging codes that preceded it, restricts itself to the creation of individual cataloging records and says little about catalog display. While rules for record construction might have been suf-
efficient to guarantee fulfillment of the second objective in the card environment, they are not sufficient to guarantee it in the online environment. Ronald Hagler has put it this way (1989, 212):

AACR2 is still written as if it were a code only for inputting data. Use of the computer, however, separates what is input from its output, or display, formats, allowing selection and reformatting decisions to intervene. Output formats have unfortunately gone somewhat adrift of the code and seem to be considered by many to be independent of cataloging rules. Special attention is now required to reintegrate them with those rules, especially in the context of online catalogues.

Widespread implementation of relationship-based displays would require an expansion of the scope of the cataloging rules. Although AACR2 purports to endorse the Paris Principles, which include the statement of the objectives of the catalog, it does not explicitly provide for the second objective in catalog displays. If the objectives are to be truly accepted and endorsed, then at some level AACR2 must provide standards or guidelines that implement them.

The number of suggestions for substantial changes in the MARC format is increasing. MARC has many problems (see, for example Leazer 1992), not the least of which is its limited ability to show relationships. Heaney (1995) presents a plan to restructure MARC records that could be used to create the type of displays presented here.

CONCLUSION

In an ideal online catalog, users would have the ability to custom-design their own displays to meet their own specific information needs. Relationship-based displays meet the needs of those users interested in seeing the range of materials available in a given library on a given work or author and would assist other users in the selection of a particular item or items. They also have the potential of significantly shortening and simplifying long displays. As Buckland, Norgard, and Plaunt (1993) noted, it is now relatively easy for our catalogs to provide a variety of record arrangements; for example, arrangements by publication date or by other elements of a cataloging record. It is not so easy, however, for existing catalogs to provide organized, relationship-based displays, nor would it be easy for users to articulate a need for a relationship-based display. It is only members of the cataloging profession who, understanding and endorsing the objectives of the catalog, have the power to change the current situation such that fulfillment of the second objective becomes a reality. Such a change is long overdue.

WORKS CITED

Carlyle, Allyson. 1996. Ordering author and


Wilson, Patrick. 1983. The catalog as access mechanism: background and concepts. *Library resources & technical services* 27: 4-17.


Journal-use studies were conducted in the University of Illinois at Urbana-Champaign Chemistry Library in 1988, 1993, and most recently in 1996. Between 1988 and 1996, the cost of purchasing the journal collection rose 66.9% while use of the collection rose 34.2%. These increases occurred during the cancellation of over 180 chemistry journals between 1988 and 1996. The data point to a collection with obvious "top" journals that generate most of the use. While the data confirm the 80/20 rule (84% of use was generated by the top 100 journals in 1996, approximately 20% of the journal collection), journal use is even more focused toward the top: approximately 40% of all use in 1996 was generated by the top 10 titles. Use of the top 10 journals rose 60% between 1988 and 1996, with nearly identical titles occupying the top 10 positions over 8 years. Longitudinal trends in journal use and cost are explored, recommendations are made for successful journal-use study methodologies, and time series, data-centered collection development is addressed.

Because chemistry serials are among the most expensive journals purchased by academic libraries, they are often targeted for cancellation. Use data and cost-use ratios can demonstrate how cost-effective a high-use chemistry serial collection can be. These kind of data also serve to provide factual, statistical reasons to give to faculty to explain why a serial was canceled or to library administrators to demonstrate why an expensive journal is cost-effective to own.

**Previous Research**

Although many types of periodical use studies have been published, only two have reported on local, longitudinal journal use. Parsons (1989) examined journal
use of the botany serial collection at the John N. Couch Biology Library at University of North Carolina at Chapel Hill over a seven-year period, from 1982 to 1988. Parsons examined total use of botany titles over this time period in order to investigate cumulative data, but she limited her analysis to the general categories of used and unused titles. She did not track use by title, by year, as it changed over time.

Naylor (1994) examined periodical use through two use studies with differing methodologies conducted in 1987–88 and 1991–92 at the State University of New York at Buffalo Science and Engineering Library. Naylor focused on methodological differences between the two studies. The first study used a reshelving methodology, while the later one used a self-reporting methodology. When all currently received serials were included in the study, an 18% drop in use occurred between the original study and the later one. Naylor concluded that the differences in reported use stem almost entirely from the methodologies employed, not from an actual change in usage patterns.

**METHODOLOGIES**

The same, simple methodology for measuring the use of journal subscriptions was employed in three separate use studies in the UIUC Chemistry Library in 1988, 1993, and 1996. A detailed description of the methodology is found in Chrzastowski (1991). Use was recorded by title (and by decade of publication in the 1993 and 1996 studies) as journals were reshelved, returned from interlibrary loan (ILL), or returned from a two-hour loan period. An alphabetical list of journals was kept to tally these uses manually. The 1988 study continued for six months, January through June. This length of survey was found to be unworkably long, and the 1993 and 1996 studies were conducted during three months, January through March. The data from 1993 and 1996 were doubled to compare the three studies. Both the six-month and the doubled three-month periods contain session breaks and a similar number of in-session weeks of class.

Each use study relied upon regular student staff to conduct and complete the data collection. No additional staff were hired to measure journal use. Student workers were asked to tally the number of journals they shelved in addition to their regular responsibilities, which include working at the circulation desk, shelving, shelf reading, and keeping the library orderly.

**ENVIRONMENTAL CHANGES**

Very little environmental change took place during the eight years of the study periods. There was no dramatic rise in the number of students, staff, or faculty members. Fewer serials were purchased due to cancellations, and although the materials budget increased (see Table 1), the increases were not sufficient to keep up with serial inflation. The changes that did occur in the physical location were more computer workstations, an increased

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Overview of Use and Cost Data for 1988, 1993, and 1996 for the UIUC Chemistry Library</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1988</td>
</tr>
<tr>
<td>Total materials budget</td>
<td>$269,875.00</td>
</tr>
<tr>
<td>Total spent on journals</td>
<td>$223,823.18</td>
</tr>
<tr>
<td>Percent of budget spent on journals</td>
<td>82.9%</td>
</tr>
<tr>
<td>Total journal use/6 months</td>
<td>31,501</td>
</tr>
</tbody>
</table>
number of photocopiers of better quality, and the introduction of IBIS (Illinois Bibliographic Information Service) in 1991. IBIS is the UIUC locally loaded database of 27 journal indexes and includes all seven sections of Current Contents among others. The Physical Sciences section of Current Contents is the IBIS database which most directly serves chemistry-related research.

HYPOTHESES

A number of hypotheses were made concerning the studies’ results. Many of these are based on the trends established in the 1988 and 1993 journal-use surveys. The hypotheses for this eight-year, longitudinal study are:

1. Total journal use will increase between 1988 and 1996 despite continued serial cancellations.
2. Off-campus interlibrary loan use (ILL) of the chemistry journal collection will grow based on other libraries’ cancellations and the dependence on UIUC as a regional source for chemistry journals.
3. Journal use will increase over 30% in the top 100 journals (approximately the top 20% of the collection).
4. The percentage of total use of the journal collection will increase most in the top 1%-5% of the pyramid of journal titles, i.e., high use in the top 10 titles will beget higher use in the following years.
5. Journal use will increase and correlate positively with the use of the library’s online journal indexes (IBIS) in the UIUC Chemistry Library.

RESULTS

TOTAL USE

An overview of use and cost data for the three use studies is shown in table 1. The cost of owning this expensive collection of science serials grew by 66.9% between 1988 and 1996, with the increased amount purchasing approximately 180 fewer titles in 1988 than in 1996. Although the materials budget for the Chemistry Library increased by 51.6%, it was not enough to continue to purchase the same number of journals. The serial collection has consumed the entire materials budget for chemistry, totaling 91.3% of the budget by 1996 (see table 1). In fact, after a successful 1991 Centennial Celebration Endowment campaign, all chemistry monographs are now purchased with donated funds or through the library’s monograph approval plan, not with the Chemistry Library materials budget.

As predicted by the first hypothesis, use of the journal collection rose by a total of 34.2%; this increase in use was easy to predict due to the trends found in previous use studies and through observation. Results from 1988 and 1993 were used to identify and cancel only those titles that were either unused, showed low use, or were not cost-effective to own (i.e., they had low use and high cost). However, canceling unused or low-use journals would not necessarily result in higher use of the journals to which the library still subscribed.

The increase in journal use might be attributable to the widely successful introduction of IBIS. A study of the effects of IBIS on journal use in the UIUC Chemistry Library was reported in 1995, and the author concluded that “patrons are finding valid, useful references to journal articles with less effort via IBIS” (Chrzastowski 1995, 641). Patrons have been able to generate lists of journal references more easily, giving them more time to locate and use journals.

Another interesting use figure is the 50% rise in journal use between 1988 and 1993 and later slight decline in use between 1993 and 1996 (see table 1). While the data show that journal use decreased in 1993 to 1996, and while the conclusions of this article are based on these data, observations of the library unit and other statistical measurements suggest that journal use increased. It is likely that once a high level of use is achieved, it becomes much more difficult to count all uses accurately using the methodology introduced in 1988 and repeated in 1993 and 1996. This problem is addressed later in this article.
TABLE 2
1988, 1993 and 1996 Use Study Results by Type of Use

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>1988</th>
<th>1993</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-library use (from reshelving)</td>
<td>28,367</td>
<td>45,632</td>
<td>41,178</td>
</tr>
<tr>
<td>2-hour circulation</td>
<td>1,689</td>
<td>476</td>
<td>276</td>
</tr>
<tr>
<td>ILL lending (non-UIUC borrowers)</td>
<td>1,445</td>
<td>716</td>
<td>812</td>
</tr>
<tr>
<td>Subtotal</td>
<td>31,501</td>
<td>46,824</td>
<td>42,266</td>
</tr>
<tr>
<td>ILL borrowing (access not ownership)</td>
<td>202</td>
<td>160</td>
<td>224</td>
</tr>
<tr>
<td>Total use</td>
<td>31,703</td>
<td>46,984</td>
<td>42,490</td>
</tr>
</tbody>
</table>

Note: Data are for six months of use.

USE BY TYPE

In table 2, journal use by type of circulation is broken down. Four different types of use were measured: (1) in-library use determined through reshelving; (2) two-hour circulation outside the library; (3) circulation to other libraries through ILL; and (4) ILL borrowing.

Because Chemistry Library journals do not circulate (except for a two-hour period), most use of the collection is made in the library, as shown in table 2. Because circulation statistics (online or manual) are often used to document use and generate reports, it is critical to collect use statistics that reflect the enormous activity taking place in the serial collection and that do not show up in the online catalog circulation statistics.

The option for two-hour circulation outside the library shows a dramatic decrease over the period studied (see table 2). This might be attributed to the installation of more and better-quality photocopiers within the library. It might also reflect the increased pressure on scholars to conduct more research in a shorter period of time; library users might find that two-hour circulation, done by hand with manual charge cards, simply takes too much time and effort. The decrease in two-hour circulation is better for all library users, because they are now more likely to find needed volumes on the shelves and not circulating.

The second fluctuation in table 2 is found in ILL lending. In 1991 (between the 1988 and 1993 studies), ILL at UIUC underwent a major change. Subsidized funding for lending by the state ceased, and fees were subsequently raised. The drop in lending between 1988 and 1993 perhaps reflects this policy and the funding loss. However, as predicted by the second hypothesis, lending increased again by 1996. Although the UIUC Chemistry Library has canceled and cut back nearly 25% of its chemistry serial collection, it still holds approximately 500 active chemistry serial subscriptions, and it can still be seen as a regional supplier for chemistry serial literature. These data lend support to the second hypothesis, although more data over a longer time period will be needed to confirm this hypothesis completely.

ILL also fluctuated over the course of the studies, rising slightly overall, but dipping in 1993. The increase in borrowing that might be expected as serial cancellations are made has not yet taken place. This is most likely due to the careful collection analysis—involving use studies and faculty consultation—that resulted in the cancellation of low-use, peripheral titles. It is also likely that the pressures of chemical science research do not allow patrons to wait the average two weeks for ILL materials. Yet another reason for steady numbers of ILL borrowing over
eight years might be the IBIS system, which has made it easier for patrons to find more citations and utilize those articles that are available in the library.

A title-by-title analysis of 1996 ILL requests was made to determine what patrons needed that was not owned (Bliss 1996). A total of 112 requests were made between January and March 1996—94 for journal articles and 18 for patents. Because patents are not available on campus, these were removed from the analysis; it has always been necessary at UIUC to borrow both U.S. and foreign patents. Of the 94 requests for journal articles, 72 (76.6%) were from journals never owned by UIUC, while 22 (23.4%) were for journals currently or formerly part of the collection. Of these 22 titles, 8 (8.5%) were previously canceled, 13 (13.8%) were out for binding or otherwise unavailable for copying, and 1 (1.1%) title was a recent subscription for which the library lacked the early volumes.

By looking at the 72 requests for titles never owned at UIUC, single requests for a single article (64 requests) made up the majority of requests. Seven titles were requested two times, and one was requested three times. The title requested three times was owned by the Chemistry Library, but requests were for volumes earlier than the library’s subscription. The low rate of ILL borrowing relative to overall use suggests that the collection satisfies well over 90% of user needs. In fact, interlibrary borrowing represents just 45% of total uses during the 1996 study.

However, there are ways that scholars can access needed information that bypass the library. For example, library users can use full-text electronic journals, commercial document delivery, or colleague-to-colleague article loans. It is possible these other avenues were pursued by UIUC chemistry researchers during the periods studied. Tracking this type of access was beyond the scope of this study.

### Use of Bound versus Unbound Materials

The ratio of use of bound to unbound materials noticeably increased in favor of unbound materials from 1988 to 1996 (see table 3). All UIUC Chemistry Library journals are bound, and most journal issues more than one year old are bound. Intuitively, use of bound materials should increase over time, as the number of bound volumes grows as a collection ages. Even with cancellations, the number of bound and unbound volumes maintains the same equilibrium (i.e., the number of bound volumes grows while the number of unbound volumes stays the same or even decreases due to cancellations). The steady increase in the number of uses of unbound versus bound materials points to the growing immediacy of the chemistry serial collection. Chemistry is a discipline almost totally dependent on serial literature; it is imperative to stay current, and researchers stay current by reading the most recent, and therefore unbound, serials.

### Use of the “Top” Journals

Trueswell’s 80/20 rule has been a determining model of collection use since first published (Trueswell 1969). Based on the UIUC Chemistry Library’s journal collection of approximately 500 paid serial titles, the 80/20 rule would measure use of the

---

**TABLE 3**

<table>
<thead>
<tr>
<th></th>
<th>1988</th>
<th>1993</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bound use</td>
<td>25,390 (80.6%)</td>
<td>35,706 (76.3%)</td>
<td>31,458 (74.4%)</td>
</tr>
<tr>
<td>Unbound use</td>
<td>6,111 (19.4%)</td>
<td>11,118 (23.7%)</td>
<td>13,076 (25.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>31,501</td>
<td>46,824</td>
<td>44,534</td>
</tr>
</tbody>
</table>

*Note: Data are for six months of use. These statistics do not include ILL borrowing since those requests resulted in photocopied articles and do not relate to Chemistry Library use by binding status.*
TABLE 4

<table>
<thead>
<tr>
<th>Top 100 Journals</th>
<th>1988</th>
<th>1993</th>
<th>1996</th>
<th>% Change ('88 to '96)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (annual)</td>
<td>$73,525.05</td>
<td>$126,215.90</td>
<td>$174,430.15</td>
<td>+137</td>
</tr>
<tr>
<td>Use (6 months)</td>
<td>25,147</td>
<td>38,737</td>
<td>35,578</td>
<td>+41</td>
</tr>
<tr>
<td>Cost-use ratio</td>
<td>$1.46</td>
<td>$1.62</td>
<td>$2.45</td>
<td>+67</td>
</tr>
<tr>
<td>Percentage of total use</td>
<td>80.7%</td>
<td>82.7%</td>
<td>84%</td>
<td>+4</td>
</tr>
<tr>
<td>Top 50 Journals</td>
<td>1988</td>
<td>1993</td>
<td>1996</td>
<td>% Change ('88 to '96)</td>
</tr>
<tr>
<td>Cost (annual)</td>
<td>$42,525.20</td>
<td>$76,186.21</td>
<td>$88,783.00</td>
<td>+109</td>
</tr>
<tr>
<td>Use (6 months)</td>
<td>20,504</td>
<td>32,779</td>
<td>29,614</td>
<td>+44</td>
</tr>
<tr>
<td>Cost-use ratio</td>
<td>$1.03</td>
<td>$1.16</td>
<td>$1.49</td>
<td>+44</td>
</tr>
<tr>
<td>Percentage of total use</td>
<td>65.8%</td>
<td>70.0%</td>
<td>70.0%</td>
<td>+6</td>
</tr>
<tr>
<td>Top 10 Journals</td>
<td>1988</td>
<td>1993</td>
<td>1996</td>
<td>% Change ('88 to '96)</td>
</tr>
<tr>
<td>Cost (annual)</td>
<td>$9,467.25</td>
<td>$16,998.00</td>
<td>$24,541.00</td>
<td>+159</td>
</tr>
<tr>
<td>Use (6 months)</td>
<td>10,260</td>
<td>17,776</td>
<td>16,468</td>
<td>+60</td>
</tr>
<tr>
<td>Cost-use ratio</td>
<td>$ .46</td>
<td>$ .48</td>
<td>$ .74</td>
<td>+60</td>
</tr>
<tr>
<td>Percentage of total use</td>
<td>32.9%</td>
<td>37.9%</td>
<td>38.9%</td>
<td>+18</td>
</tr>
</tbody>
</table>

*The "Cost-use ratio" is the number of annual journal uses divided into that year's annual subscription price. It has not been adjusted for the number of issues available per title, and therefore cannot be accurately labeled as "cost per use."

Garfield (1996) studied citation concentrations, which can be used to confirm that this phenomenon does not occur only in the UIUC Chemistry Library. In a study of 3,400 journals indexed by Science Citation Index in 1994 and reported in the Journal Citation Reports, Garfield found that 40% of citations (i.e., use) were generated by 100 journals, 2.9% of total journals indexed, a "40/2.9" equation, similar to the findings of this study.

Table 4 shows the percentage of total use for the top 100, top 50, and top 10 titles. Although it is proposed that journal use was underrepresented by tallies in 1996, it is valid to look at the percentage of total tallied use for each year that each portion of the collection generated. The percentage of total use of the top 100 journals increased 4%, the percentage of total use of the top 50 increased 6%, while the percentage of total use of the top 10 titles increased 18% in eight years. It is obvious that the area of greatest concentration of use lies in the top 10 journals, which represent the top 2% of the top 100 journals to verify Trueswell's rule. In fact, in 1996, 84% of the use came from these top 100 journals, just slightly over Trueswell's prediction (see table 4). Use of the top 100 journals increased 41% between 1988 and 1996, addressing the third hypothesis, which predicted an increase of 30% in the top 20% of the journal collection. Use of the top journals was therefore higher than predicted.

It is possible that Trueswell's rule does not go quite far enough and was proposed at a time when financial constraints weren't so extreme. The data point to an extremely cost-effective top 10 titles that account for 38.9% of use by 1996, climbing 60% from the previous 8 years (see table 4). Only 2 titles fluctuate out of the top 10 over the eight years, falling 2 places to numbers 11 and 12; these were replaced by journals previously in the top 15. In 1996, 2% of total UIUC Chemistry Library journals (10 titles) accounted for nearly 40% of journal use, which might be considered a "40/2" equation.
TABLE 5
RESHELVING, PHOTOCOPYING, IBIS, AND JOURNAL-USE STATISTICS FOR THE UIUC

<table>
<thead>
<tr>
<th></th>
<th>1988</th>
<th>1993</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal use</td>
<td>31,501</td>
<td>46,824</td>
<td>42,266</td>
</tr>
<tr>
<td>Journal reshelving</td>
<td>31,594</td>
<td>48,470</td>
<td>41,798</td>
</tr>
<tr>
<td>Photocopies made</td>
<td>141,479</td>
<td>329,409</td>
<td>369,500</td>
</tr>
<tr>
<td>IBIS connect hours¹</td>
<td>66:36:32</td>
<td>388:52:04</td>
<td>510:34:54</td>
</tr>
</tbody>
</table>

Note: All statistics have been corrected for a comparable 6-month period, January to June.

¹IBIS connect hours were generated by Barbara Larson of AI&IS. Connect hours were measured at the UIUC Chemistry Library workstations only: 2 workstations in 1988, 3 in 1993, and 4 in 1996. Statistics are for connect hours to all Current Contents databases combined; Current Contents is the most frequently used and most subject specific database for Chemistry found on IBIS.

Since IBIS was not introduced until late 1991, these connect hours are for January–June 1992.

the serial collection, confirming hypothesis number four.

COST OF THE "TOP" JOURNALS

The annual cost of purchasing the top 10 titles rose 159% in 8 years, reflecting annual inflation rates approaching 20% per year (see table 4). In comparison, the total chemistry journal collection grew in annual cost 66.9% over the same period, averaging approximately 8.4% per year (see table 1), less than half the inflation rate of the top 10 journals.

The correlation between high use and high cost has been noted before. According to Dougherty and Barr (1988, 8): "Every study we’ve done or seen indicates that high cost and high use are linked . . . Publishers know what they are doing when they price their core journals." This established correlation is why the names of the top journals or the use ranking by title established by this study are not included in this article. Publishers realize that "top" titles are unlikely to be canceled and therefore might be pricing their premier titles at higher rates than lesser-used titles. It is also possible that high-use titles are safe ways for publishers to expand the publishing pool, creating larger volumes or more frequently published issues, increasing both the price and the number of pages published. It is not surprising that there is a correlation between high use and higher rates of inflation, as the marketplace drives many collection development decisions in libraries during times of serial inflation (Chrzastowski and Schmidt 1996; Cummings et al. 1992). Libraries are forced to balance their serial budgets while receiving minimal increases, which results in journal cancellations. This leads to a reduction in profits for publishers, who then raise prices on premier core journals.

TOTAL USE REVISITED

As stated earlier, the data show that while journal use increased overall between 1988 and 1996, it declined between 1993 and 1996. In contrast, IBIS use increased steadily over the entire set of studies. Consequently, hypothesis 5, which predicted an increase in journal use correlating with IBIS use, must be rejected (see table 5). Although journal use did increase overall (1988 to 1996), it does not follow the same even increases found in IBIS or photocopy statistics.

However, both direct observation in the library and data taken from outside the use study show that use of Chemistry
Library collections and services consistently increased. Table 5 shows data from four separate and independent sources: (1) daily journal use tallied by student workers for the three use studies; (2) daily journal reshelving, tallied by all shelve (staff and students); (3) number of photocopier counts made, tallied by counters attached to each copier; and (4) use of online journal indexes in the Chemistry Library based on transaction logs. The nonhuman tabulated elements—photocopier counters and online connect hours—closely match the observed use of the collection, which shows steady increases.

Photocopy counters provide the most valid nonhuman tabulated measurement of journal use in the UIUC Chemistry Library. Brown (1956) found that the chemistry discipline had the highest journal citation rate in the sciences (93.6%); thus, presumably, demand for journals is very high. Direct observation of journal use in the library suggests that it continues to increase. For example, large numbers of journals (which users are asked not to reshelve) are consistently found next to photocopierns, reinforcing the statistics taken from photocopy counters.

Data in table 5 also point out the difficulty in reproducing this study. The 50% increase in use (1988 to 1993) translates into a 50% increase in the time and energy needed to conduct the study. In 1988, journal use and reshelving were nearly identical, which is expected (see table 5). By 1993, as use rose by 50% over 1988, use was possibly underreported because there is little correlation to reshelving statistics. By 1996, it is difficult to see the relationship between use and reshelving, which are two separate measures of the same function: journal use. Due to the disparity between the data and observations of use, a survey was launched to “study the study” to gain insights on the data collection process.

1996 Use Study Survey

Each of the 14 students who participated in data collection for the 1996 journal-use study was given a follow-up questionnaire. Eleven questionnaires (78.6%) were returned. One was discounted; 10 were tallied. Appendix A shows the results of the survey.

It is obvious that the study was not carried out as planned, as all (100%) of the students who replied admitted that there were times they could not record all journal uses (see appendix A, question 1). The majority of students (60%) felt that their priority was to shelve, not to shelve and conduct the use study (see table 6, question 2). According to this survey, students were able to tally journal use approximately 84% of the time.

In question 5, in which students were asked to identify the purpose of the study, it was found that the students did believe that both money and space savings were part of the objective. Only 10% of the students really hit the nail on the head: that the original purpose was simply to study journal use. It is often the case that other objectives become apparent after the fact; an unplanned component of this study was to measure student motivation and the effectiveness of our methodology.

It is important to note that students were initially trained to conduct the study. They were also told why the study was important and what the objectives were. Two-thirds of the way through the study, the level of complaints by student workers grew fairly loud. Food was brought in to express thanks and appreciation for a job nearly completed. The edible encouragement did slightly improve morale and made it possible to complete the study. Thanks and food were also part of our “The Journal-Use Study Is Finished!” celebration.

The most obvious conclusions are: first, that collection use has outgrown the methodology designed to study it; and second, there is only so much that student workers will and can be expected to do for minimum wage, especially when student employees in other units were not asked to perform the same duties.

RECOMMENDATIONS FOR JOURNAL-USE STUDIES

A number of recommendations for journal-use studies can be made based on this longitudinal use study.
Barcoding of a collection is critical to enable a more precise and easier-to-achieve use study. Students seem much more likely to whip out a scanner and “shoot” barcodes than to tally by hand on multiple sheets of paper, especially when they face long study periods or tens of thousands of tally marks. The Chemistry Library collection was barcoded in summer 1996, six months after the 1996 journal-use study was completed.

The purpose of the study should be clearly identified and reiterated throughout the study to those assigned the task of conducting the survey. Training, communicating goals, and following up during the study will secure more confident results. The study should be followed with a survey of participants to check on their perceptions. Those involved are able to provide the best feedback on methodology and give good recommendations for improvements. As Herzog (1989, 90) recommends for effective journal-use studies: “[T]est and revise, retest, and revise again.”

Collect and tabulate data on every measurable library service. Correlations can be drawn between interconnecting services like photocopies and journal use, budget cuts and interlibrary borrowing, or library hours, journal use, and workstation transaction logs. Each library cause and effect will be reflected in the statistical record. Computerize the record to facilitate comparisons.

One snapshot of use or circulation data is useful and informative; it will begin to identify the collection’s core and establish the pyramid of use: top, middle, and low-use journals. However, begin with a methodology and time period that will be easy to repeat. Even greater value comes from multiple studies over time, which document how the collection grows and changes.

OTHER APPLICATIONS FOR LONGITUDINAL JOURNAL-USE DATA

One of the most beneficial results of these use-by-title data is to manipulate the data for true collection development evaluation. Carrigan (1996a, 1996b) calls for an evaluation of collection development to determine both overselection (materials purchased and not used) and underselection (materials needed and not purchased). To evaluate collection development, rather than collections, use data is required. Hamaker (1995) rightly states that the greatest benefit to this type of collection evaluation is not just use data, but longitudinal use data (“circulation data” to Hamaker).

The longitudinal use data from this study point to a chemistry serial collection that has already benefited from this type of analysis. Beginning in 1988, all serial cancellations were made from the bottom of a list ordered from most cost-effective to least cost-effective. Cost-effectiveness was determined by a formula that estimated a cost-use ratio. In 1988, there still were journals being purchased that garnered zero use. These were the easiest to cancel. As time passed and budgets lost more purchasing power, the cost-use ratio grew to include titles with documented (albeit still low) use. The studies were repeated over the years because of the important role of current data in determining cost-effectiveness, and the political benefit of owning current, objective data.

By 1996, the defining line between journals to keep and those to cancel reached a cost-use ratio of $40.00—what might be considered a very cost-effective journal to own in many university libraries. This ratio was chosen based on a science-journal document delivery cost. Many commercial document delivery companies charge in the $40 range to copy and deliver an article. While it is easy to bemoan the loss of approximately 180 journals over the past eight years—nearly 25% of the serials collection in chemistry—the collection development evaluation made possible by the very use studies that determined the canceled titles now allows some satisfaction. Journal use is up (though fluctuating), the number of interlibrary loans remains stable and accounts for less than 1% of use, and there are no paid serial subscriptions that are not used. As accountability becomes a more critical factor in lean budget years, the question often becomes, “how effectively is the budget for materials being spent?” By collecting and analyzing longitudinal use or circulation data, either by title or by classifi-
cation, this question can be addressed with confidence.

CONCLUSIONS

As mentioned earlier, collecting and analyzing longitudinal journal-use data have provided the answers to a number of collection evaluation questions. The data show a collection definitely under attack, with approximately 25% of the serial collection lost over eight years. However, serious damage to the usefulness and vitality of the collection has thus far been avoided due to careful dismantling and reliance on use and cost-effectiveness data from the studies. This is also a collection at its core, with a maximum cost-effectiveness level of $40.00 per use establishing whether the library will continue to subscribe. There is no further room for canceling chemistry journals without seriously undermining the usefulness of the collection. The longitudinal data also establish that the methodology, which worked well in 1988, is not adequate for higher levels of use. Barcodes, applied in summer 1996, must be used to track and count uses in the next UIUC Chemistry Library journal-use study, scheduled for January–March 1998.

The data from three use studies conducted over the past eight years point to the chemistry serials collection as a fluctuating, breathing force. In short, Ranganathan was right, a library is a growing organism. Use ebbs and flows, more or fewer ILL requests are made, journals used, and pages copied. The collection responds to movements in staff, numbers of copiers, hours of operation, seasons of the year, and most definitely to budgets, by breathing in and out. Literally a myriad of causes are marked by effects. The losses to the Chemistry Library serial collection can be measured in canceled serial titles, budgets that cannot keep pace with serial inflation, and in staff who cannot always be expected to incorporate new tasks, such as use studies, into their daily workflow. Fortunately, there are gains to balance these losses: a high use collection that is focused, balanced by interlibrary borrowing, able to continue to lend to others, and documented by the statistical record. The proof is in the inputting.

WORKS CITED


APPENDIX A

JOURNAL-USE STUDY QUESTIONNAIRE RESULTS FOR 1996

1. Were there times when you were not able to record uses for all of the journals that you shelved?
   100% of respondents answered yes.

2. If you answered yes to question 1, what would you say was a higher priority?
   A. Making sure that all of the journals were shelved before your shift was over, even if this meant that you were unable to record all journal usage; or
   B. Making sure that journal usage was recorded even if this meant that you would not be able to shelve all of the journals before the end of your shift.
   60% indicated that answer A was a higher priority.
   20% indicated that answer B was a higher priority.
   20% indicated that their priority was sometimes A and sometimes B.

3. Over the course of the study, what percentage of the journals that you shelved do you estimate you were able to record?
   The average estimation of the percentage of journal use recorded 84.3%. The high and low estimations ranged from a high of 98% to a low of 10%.

4. Was boredom or monotony a factor in your ability to record all journal usage?
   Yes: 60%
   No: 40%

5. As far as you know, what was the purpose of the use study? What did you think the data would be used for?
   There were four different types of responses to this question. Some provided more than one reason for doing the study.
   The purpose of the study was:
   To save money/cancel unused journals: 50%
   To save space/move unused journals: 40%
   To justify the cost of owned journals: 10%
   To see which journals were used: 10%

6. Since you are the ones who performed the bulk of the data collection, do you feel that data collection procedures could be improved? How?
   Responses to this question varied quite a bit. Some common themes include the idea of working in teams, barcoding, and making the tally sheets easier to use.

Note: Fourteen students participated in the study; eleven questionnaires were returned (a 79% return rate).
Data Entry and the Economy of Offshore Information Production

Steven Ellis

In this article a review of the data-entry industry and the role information organizations, such as libraries, play in that industry is presented. Information organizations are participants in an economy of information production—one that is becoming globalized. With this globalization, new production practices have emerged. However, research has been accumulating for some time that calls the labor practices of the data-entry industry into question. With these labor practices come ethical dilemmas for information professionals. It is therefore necessary for the information professions to come to an understanding of this emerging economy. It is argued that an ethics of data conversion can neither arise through ceasing production offshore nor from technological advances in data-entry technology. An ethics of information production must involve the cooperation of both producers and consumers alike.

Information systems are designed to permit ease of use, not to reveal their origins. Yet information that is "electronic" by necessity has to get into the machine in some way. Often this process is referred to as "data entry." It is the purpose of this paper to look at how data entry has often come to be accomplished, to consider the appropriateness of this situation, and to determine the need for ethical standards to guide decision making in the acquisition of converted data.

There is no single solution to the problem of data entry. Every document and project presents challenges to conversion. Not only must decisions be made about database and document structure, decisions must also be made about the means of production and the use of conversion technologies such as imaging, optical character recognition, or manual keyboarding. Decisions about the means of data entry have been made about many of the thousands of electronic products currently in the information marketplace.

For all that has been written about digitization trends, we have seen comparatively little on how and where information is produced when it is converted to electronic formats. In addition, there has been very little or no treatment in the literature on the ethical obligations of information professionals who purchase electronic information on behalf of their constituencies. This represents a significant gap.

In pursuing conversion strategies, two factors have often been key: cost and data integrity. Lower costs are often sought as long as quality is maintained. In this process, "outsourcing" might emerge as a production option. In outsourcing documents, a library, publisher, or vendor can "go offshore" in pursuit of lower data-
entry costs. The research surveyed here indicates that the consideration of cost and data integrity alone might not adequately account for needs in all sectors of the data-entry economy, however. Like other industries that participate in a global economy, such as garment manufacturing, the data-entry industry often shows the signs of gender discrimination, work-related health problems, and the sorts of quick changes in location by production firms that leave local areas no better off than they were prior to the firm's arrival. It is argued here that a third factor needs to be introduced into the data-conversion system: an ethical framework that both would ensure adherence to fair and equitable practices in data production and guide information professionals in their purchasing decisions.

Within the global economy, there are systems of regulation that might provide useful examples in understanding the ethical requirements of the data-entry economy. The garment industry has been subject to a number of checks and balances in order to ensure that production firms meet their liability to their workers. For example, U.S. clothing manufacturers are subject to a combination of regulatory measures, some that originate from within the company, some from international trade agreements, and some from international public law. Such regulatory environments would not be possible without predefined ethical standards stemming from perceived needs. News media and industry experts play a role by focusing public attention on problems, and consumers play a role by making purchasing decisions based on perceptions of the industry.

It is the goal of most information organizations (such as libraries) to provide seamless, transparent information access for a constituency of users. As more information organizations consider low-cost solutions for converting large portions of their collections to electronic formats, the importance of supporting an ethics of information production and consumption grows. Certainly this importance is already upon us as most well-financed information organizations acquire an array of electronic products with little sense of how they were produced. It is argued that without a thorough understanding of the conditions of information production, access organizations could be participants in the perpetuation of inequalities their values might not permit.

**Offshore Data Entry**

Libraries and other information organizations participate in a global economy of information production. Just as going offshore for data-entry services has become an option available as a means to reduce costs for libraries, publishers, and vendors, so providing data-entry services has become one way for less developed countries (LDCs) to attract foreign investment. In many LDCs, foreign corporations find a flexible, skilled, and semiskilled labor force at wage rates that would be 6 to 12 times higher in the United States (Office of Technology Assessment [OTA] 1985). Foreign information organizations might require a number of data-entry or data-processing services, often involving the conversion of printed materials to electronic formats. These materials might include anything from airline ticket stubs to library catalogs. Publishers and online data services companies are targeted by data-entry firms for their long-term potential for growth and perhaps represent an even more viable market than more traditional offshore clients such as the insurance industry (Posthuma 1987). It would seem that as the demand for electronic data increases so will its production offshore.

Many LDCs see in this burgeoning market both a short-term opportunity to provide jobs for their citizens and a long-term opportunity to promote fledgling microcomputing industries, a process referred to as "technology transfer" by development experts. When technology transfer occurs, technologies that require less skill might be replaced by those requiring greater skill. For example, routinized work such as semiconductor manufacture might give way to more highly skilled work such as authoring software. While the number of jobs might rise dramatically with the introduction of routinized work performed for foreign firms,
technology transfer does not always occur as planned, although it remains a goal for local planners, development experts, and economists seeking to develop skilled industries. Unfortunately, the research reviewed here indicates very little evidence for technology transfer in the data-entry industry.

With regard to existing jobs and labor practices, data-entry firms, both foreign and locally owned, are often in the position of perpetuating poor labor conditions. Each study examined here brings into focus two characteristics that deserve detailed attention: (1) data-entry workers often suffer from work-related health problems, and (2) data-entry workers are often the object of gender discrimination.

The vast majority of data-entry operators are women who, not coincidentally, are offered little opportunity for advancement. The kinds of skills a data-entry operator acquires might have little application in other jobs, especially those that provide higher pay and more responsibility (Pearson and Mitter 1993). This pattern of gender-based hiring—combined with a lack of mobility or opportunity for the acquisition of skills—is what Haraway and others following her, have called the Informatics of Domination (Haraway 1991).

In addition to often being the object of gender discrimination, data-entry operators often suffer from many of the same physical and psychological ailments associated with traditional offshore manufacturing, such as the much-criticized garment industry. For example, in Brazil, the data-entry industry is promoted locally as the “profession of the future”; however, Brazilian data-entry workers suffer from a variety of physiological disorders, including a high incidence of musculoskeletal diseases, fatigue, and depression (Sores 1991). However unfortunate it might sound, these women have become the drones or “feeders” of the global information economy (Posthuma 1987).

My purpose in this paper, then, is to provide an ethical framework that would account for inequalities of the data-entry system through the responsible acquisition of converted data. This framework would not be possible, however, without a more complete understanding of the requirements of a global economy and the conditions of information production as that production occurs in LDCs.

**THE REQUIREMENTS OF A GLOBAL ECONOMY**

As economies become interdependent, new regulatory systems emerge. These regulatory systems have ethical components, some with regard to labor. Yet, as De George (1993) notes, the global economy currently lacks adequate background institutions, unlike many nation-states. Background institutions are those bodies of legislation and regulation that would codify acceptable standards and practices in the general interest of interdependent nation-states. In the absence of truly international background institutions, industries are regulated by a combination of the laws and standards where products are produced, as well as by the laws and values of countries where products are consumed.

A number of U.S. trade laws reflect and attempt to manage this interdependence with regard to labor issues. For example, in the United States the Generalized System of Preferences (GSP) allows certain domestic products to be exported duty-free to designated “beneficiary developing countries.” In order to be included in the program, a developing country must take or have taken “steps to afford internationally recognized worker rights to workers in the country (including any designated zone in that country)” (Trade Act of 1974, sec. 2462[b][7]). Worker advocates have used the petition process within the GSP frequently to challenge a given country’s inclusion in the program as a means to support workers’ rights (Ho, Powell, and Vlopp 1996).

The internationally recognized rights specified within the GSP have bearing on offshore data entry insofar as they demonstrate a framework within U.S. law for ethical responses to international matters. According to the standards defined in the GSP, workers have the right to associate freely, to organize, and to bargain collectively—these in addition to prohibitions against slavery and low wages for children.
Workers also are entitled to “acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health” (Trade Act of 1974, sec. 2462[a][4])—provisions that have direct bearing on the problems particular to the data-entry industry. Whatever the industry, however, the recognition of such universal rights provides a baseline for forming ethical responses to labor inequalities in a global economy.

An ethics of information production would therefore include a set of minimum acceptable practices for the data-entry industry and for information professionals. This would include both the material requirements of the information economy (the inevitable need for more data) while it would include a consideration of both the local economies and the employment needs of data-entry operators. These minimum ethical standards might be integrated into existing codes and practices by which information professionals conduct their business of vending or buying electronic data.

**Understanding the Data-Entry Economy**

Geographers have witnessed for some time the trend that information is being exchanged over greater distances (Hepworth 1990). The globalization of consumer markets, trade deregulation, and advances in telecommunications have contributed to an increased interdependence among nations and the emergence of extranational entities, such as transnational corporations (TNCs). Such corporations are now able to consider global strategies in markets, investments, and in the quest for cheap labor—a trend globalization experts have come to refer to as “capital and labor flexibility.” Many information organizations frequently contract with corporations that show the signs of TNC flexibility, either directly or through subsidiaries.

With the emergence of TNCs in mind, the history of data entry is best understood through the history of back-office operations. Since the 1950s, with the introduction of office computer applications, high-volume and repetitive data-processing activities have been consolidated and moved to areas where costs are lower (Nelson 1986). Throughout the 1980s, certain U.S. firms—many in the airline and insurance industry—established offshore bureaus for the purpose of performing manual clerical work at a lower cost. In the case of American Airlines, for example, this included the establishment of a wholly owned subsidiary, Caribbean Data Services (CDS), to process its data-entry needs. Over time, CDS has proved so profitable that it now contracts its services outside the corporation. CDS recently opened a U.S. $10 million data-entry plant in Barbados employing 1,500 people (Pearson 1993). Similar success stories abound. For example, Hamilton (1990) presents a popular account of Saztec, a foreign-owned data-entry firm with production facilities in the Philippines.

The success of data-entry firms would not be possible if it were not so easy to exchange labor in one area for labor in another. Such rapid and frequent changes in location worry development experts. When considering the prospects for an abandoned area, Posthuma (1987, 62) writes that former hosts are left with “nothing more substantial than a few trained keyboard operators, and an abandoned factory shell with the empty electrical outlets, which formerly powered the data entry terminals.” In Grenada, when unsettled conditions arose in the early eighties, the back-office operation of a large American accounting firm (Coopers & Lybrand) relocated quickly (OTA 1985).

The ease with which labor in one area might be exchanged for labor in another is not unlike corporate restructuring in the United States, where whole service bureaus have been relocated from urban areas to suburban ones, again to take advantage of cheaper labor. Host-country policy often facilitates this style of corporate mobility in the form of incentives like those offered in Jamaica’s Montego Bay Free Zone, including low-cost facilities, tax benefits, and the right to repatriate all profits and dividends to the home country (International Labor Organization 1990). Free zones are de-
signed specifically to attract foreign capital and sometimes have little effect on local economies, other than to benefit elites. In Jamaica, as of 1993, 5 of the 25 data-entry firms were U.S.-owned subsidiaries or U.S.-Jamaican joint ventures. A new generation of black entrepreneurs owns and manages the remaining firms, although all but three of these firms operate outside of the free zone and are thus unable to pass on to clients the benefits foreign firms can. In the Dominican Republic, Barbados, and St. Lucia, almost all of the data-entry operations are foreign-owned and are believed to be operating within free zones (Pearson 1993).

Advances in telecommunications increase the degree to which areas can compete with one another for foreign capital (Warf 1995). A hard-copy insurance claim might be sent to the host country from New York by mail or overnight air. Once the data are processed, they might be beamed back via satellite or leased fiber-optic line. However, the temptation to account for rapid changes in location by reference to what technologies make possible must be resisted. The burden for such decisions must be placed on host countries, the transnational firm producing or vending the information, and the companies and individual organizations purchasing the information for subsequent sale to libraries and other information organizations. Information professionals have a role to play throughout this process by both identifying the underlying ethics within their profession and using those ethics to define guidelines for the production and acquisition of electronic information.

TRACING DOCUMENTS

It is difficult to trace when and where documents are converted to an electronic format case by case. Most electronic documents show no sign of manual data entry and certainly never reveal anything that might indicate something so specific as country of origin. None of the product tracing performed on clothing manufactured in sweatshop conditions has been done with regard to electronic documents.

In the information profession, anecdotal evidence points to a general lack of awareness about how documents are converted. "I didn’t know" was the reaction of one librarian in charge of a data-conversion project when told by a reporter about the data-entry firm with whom the library had contracted—even in this case when the firm was domestic and employing workers in a monastery (Young 1996). While working conditions in this case might be favorable, the example illustrates a general lack of awareness of how electronic products are made, by whom, and under what conditions.

Finding out about the conditions of production for firms offshore presents its own difficulties. Like the tips of organizational icebergs, many firms that provide document-conversion services have small bureaus located in developed countries in order to transact business with their clientele, whereas the vast majority of their operations are located in less developed host countries. On the whole, information professionals need to be aware of the way in which certain institutions within the data-entry industry make the practices of data entry hard to see.

WOMEN, SKILLS, AND WORK

Despite the difficulties in tracking labor practices, in some LDCs conditions have been well documented. Each situation shows striking similarities in job-related health problems and routine polarizations of skill and gender. Both features of the data-entry economy are generally considered by development experts to be undesirable outcomes of employment in any country.

In contrast to the mobility of the TNC, the opportunities available to the data-entry operator are few. Many of the free zones where foreign-owned data-entry operations are located do not allow unionization as part of their charter (Pearson and Mitter 1993). The number of people affected is high. Sores (1991) reports that data-entry operators make up 36.2% of the information work force in Brazil. The author further outlines the situation there: There are three shifts for data-entry
operators in São Paulo. Workers are evaluated according to their production rates and pace of work, which, like many data-entry operations, is electronically monitored. Fifty percent perceived that their health had worsened since they began to work with video display units (VDUs). Eighty percent complained of general tiredness; 54% of headaches. There was a high incidence of musculoskeletal disorders of the arms, shoulder and neck area, back, and legs. According to the medical statistics of the organization surveyed, 17 operators had been diagnosed as having tenosynovitis, of whom five had to be permanently moved to other kinds of work. So as not to leave any doubt about the demands of such levels of productivity, Sores concludes with this remark gathered from a data-entry operator: “Whoever looks at us from outside can perceive that we are in the slavery age, working as a slave and being whipped, not in our bodies, but in our minds” (p. 1223). Likewise, in Malaysia, Ng and Othman (1991) reported a survey undertaken in 1990–91 of 216 data-entry operators; their survey revealed a high incidence of eye problems (affecting over half), disorders of the hands and wrists (46.7%), and of the shoulders, neck, and back (33.3%).

Although there is little documentation on keyboarding-related health problems in Jamaica, Pearson and Mitter (1993, 50) make the situation plain: “[I]n terms of pay, conditions of work, opportunities for promotion, security and longevity of employment, this sector does not perform any better than the garment factories in Kingston’s free zone.” Other regions that are known to have fairly extensive data-entry operations include Mexico, the Philippines, Singapore, St. Lucia, St. Christopher-Nevis, St. Vincent, India, and Ireland.

Unsafe working conditions are not restricted to LDCs. It has been reported, for example, that Japanese data-entry operators complain of electronic surveillance, restrictions on physical mobility, high levels of exhaustion, and dissatisfaction with nature of the work. In a survey of over 13,000 conducted by the General Council of Trade Unions (Sohyo), Shiga (1987) found a higher rate of pregnancy abnormalities among women who spent long hours with VDUs. The author also found a link between VDU work and psychological disorders, including depression, abnormal eating habits, and alcohol dependency.

The kinds of skills a data-entry operator acquires might have little application in other industries. This contributes to skill polarization, or the segmentation of the labor force into a small class of highly skilled systems analysts, programmers, and related occupations on the one hand and, on the other, a group of clerical and related jobs, which includes data-entry workers (Pearson 1993). Based on the surveys in Malaysia, Jamaica, and Brazil, clerical jobs outnumber technical ones by about ninety to one (Pearson 1993). The practice of body shopping exacerbates this fragmentation. In shopping for bodies, transnationals strip out the highly skilled LDC workers (mostly men) by transporting them from their home country to the clients' place of work to take advantage of superior hardware and alleviate any "lack of trust" a worker in a distant location might incur (Pearson 1992). For example, Indian workers provide as much as 80% of software services to clients on-site overseas. In a similar way, a general pattern with foreign-owned data-entry firms is that high-skill jobs are filled by personnel under the control of the foreign firm, rather than filled by local personnel (Posthuma 1987). This practice does little to contribute to the host country's economy, because healthy local economies by necessity require the community and salary input of more highly skilled and higher-paid workers.

Skill polarization cannot be understood without recourse to the division of labor by gender. Up to 98% of those employed in the data-entry sector are women. This does not signify an opportunity, however. Instead, women are often considered to be a source of cheap labor and are given positions that require a minimum of skills. Each of the studies surveyed here points to a form of gender bias that perpetuates a closed cycle: data-entry women are locked into physically damaging work with little or no opportu-
nity for making transitions to traditionally male (and increasingly scarce) technical or supervisory roles. As one manager of a large data-entry facility put it: "Women are better at this kind of job. They are more dexterous, more disciplined, more caring about the quality of work and more agile" (Barnes 1989, 18).

The more disciplined, dexterous, and dependable an operator is, the longer she can stay at the machine, and the higher her productivity will be—a gender role that easily legitimates the very sorts of production practices that have proved problematic. Discrimination of this kind is something no amount of worker safety and ergonomics will resolve.

TECHNOLOGICAL SOLUTIONS?

In spite of the growth of the offshore data-entry economy, some will argue that the technology exists now, or will one day soon, to eliminate the need for what those in the ergonomics and productivity industry call the "human factor." This technology falls under the rubric of optical character recognition (OCR). OCR has been in existence in its most basic form for roughly thirty years and only within the last ten has achieved accuracy rates that under some circumstances are equivalent to manual keyboard entry. Yet, however unfortunate it might be, there are good reasons why the conversion of printed documents to an electronic format will for the foreseeable future require substantial human intervention. Human operators are needed not only for less routinized tasks, such as error correction and general editorial work; the process will very likely continue to demand extensive manual repetitive operations as well.

As an example, Saffady (1995) argued recently that OCR technology represents an alternative of much lower (monetary) cost to manual offshore data entry. These figures are based on very large-scale, and at this point hypothetical, library digitization projects costing more than U.S. $1 million. However, with projects of this scale, offshore costs and OCR are roughly equivalent when OCR completion times are reduced to 1 year from 2.5, increasing the number of workstations needed to begin work. This means that in smaller-scale projects, OCR costs will continue to outstrip offshore costs due to the need for high initial expenditures on hardware. In contrast, most offshore data-entry jobs are routinely of a smaller scale (Pearson and Mitter 1993).

All of this assumes that OCR technology is an effective means for document conversion, which might contradict the experience of those involved in large- and small-scale conversion projects over the years. According to Olsen and McLean (1993), OCR is more costly for large-scale conversion projects. Olsen has presided over the conversion of more than 120 million words of French primary sources. OCR costs more because documents produced in this way require extensive post-production editing to correct those errors initially produced by the machine. Manual keyboarding simply reduces the number of errors by introducing the human element at the beginning of the process rather than the end. When asked about the utility of OCR technology, the Conversion Coordinator of the National Digital Library Project recently told a reporter for American Libraries: "The human being is a more effective device" (Backstage 1996, 27).

OCR is less effective than keyboarding not only due to the number of machine-produced errors. There are things OCR simply cannot do. All documents have elements that by nature require manual keying simply because they have little physical presence within the document that the OCR software can recognize. Consider an average monograph as an example. For the document to have its full functionality in its electronic version, elements such as headings, page numbers, and footnotes must be specified with metadata. This metadata must be manually keyed. Database designers also might add a number of metadata elements to aid retrieval.

As digitization proliferates, so will the complexity of documents. I would not like to suggest that OCR will never work, or even that it has not been used effectively in certain projects. The fact remains, however, that it has not been widely used and
most likely will not be used in conversion projects for some time. From this perspective, the uncritical affirmation of OCR technology by information professionals and industry spokespersons might serve the purpose of diverting attention from routinized low-technology operations by relegating them to a thing of the past.

**TOWARD AN ETHICAL STANDARD**

As information organizations become driven by the imperatives of zero-sum management and outsourcing becomes commonplace, the increased export of routine processes offshore would seem inevitable. By the middle 1980s, the Library of Congress had already experimented with such a strategy with its Overseas Operation Division (Kniskern 1986). There needs to be a greater awareness within the information profession of the economy of information production. It has been suggested that the global economy is susceptible to exploitative production practices. With this in mind, I believe an ethics of information acquisition is required. The information professions are in a unique position to shape the development of the data-entry economy through ethically informed decision making. For example, librarians developing collections might consider the means of production as one evaluative criterion for the electronic information they acquire.

But why ethics? As a field of study, ethics is concerned with the moral choices made by individuals in relationship with other choices. Professional ethics are the rules or standards that govern the conduct of the members of a profession, of which the most well known are those included in the Hippocratic Oath adopted by physicians worldwide. In a similar way, the Association for Library Collections & Technical Services (ALCTS) supplement to the American Library Association Code of Ethics reads that an ALCTS member both “strives to provide broad and unbiased access to information,” as well as “fosters and promotes fair, ethical and legal trade and business practices” (ALCTS, Acquisition Section, 1995). This general statement makes explicit what many have always assumed is their ethical responsibility as librarians and information professionals. Such written codes of conduct can be helpful, although in order to be useful ethics must be put into practice as context-specific problem-solving tools.

Ethics often operate behind our everyday actions. Understanding the ethics that underlie daily practice in the field can assist in formulating an approach to the data-entry industry. Within the information professions, an emphasis is often put on access to information without barriers—as well as on the principle of intellectual freedom for authors and readers alike. Librarians purposefully select information resources to represent all sides of controversial issues and offer information services that assist people in finding what they need without charging for each use. These moral values and principles are subsequently upheld in the everyday actions of information professionals taken on behalf of users. Similar professional values and standards might be brought to bear in developing ethical tools to assist daily decisions in the acquisition of electronic information.

**AN ETHICAL FRAMEWORK**

If the conditions of offshore data entry often conflict with the values of information professionals, the question becomes how we might enable ethical decision making in the purchase of electronic products. Such decisions will demand specific kinds of documentation on the conditions of data production—documentation that would allow information professionals to know whether a given product was produced in accordance with accepted labor practices and standards, and not in a data-entry sweatshop. The requirement of such documentation would have the added function of bringing production firms into compliance with acceptable standards and practices.

Three problems have been isolated with regard to the data-entry industry. Each problem requires a specific kind of documentation.
1. Data-entry operators are at risk with regard to work-related health problems. The working conditions of data-entry operators must be documented when a given unit of information is produced. Data might include level of health benefits, how workers are paid (by keystroke or hourly), and incidence of musculoskeletal disorders.

2. Data-entry operators are often the object of gender discrimination. The existence or lack of firm-sponsored programs intended to allow data-entry operators to transfer their skills to higher levels of responsibility must be documented.

3. Features of the data-entry economy make tracing a given information unit to its origin difficult. Written proof of place of origin (country, city, or zone within either) must be available for electronic products. If parts of a given product have been produced in different locations, each must be documented. The length of time a firm has been in its current location might also be documented. Each of these forms of documentation would provide the means for information professionals to respond ethically when making purchasing decisions. It remains to be seen, however, what agency or agencies would be responsible for the form and accuracy of documentation. In this regard, both the garment and the forest-products industries furnish examples of international regulation from which we might learn.

In the garment industry, no single system of regulation has emerged. Ho, Powell, and Vlopp (1996) outline the range of systems currently in place. Many production firms in the garment industry, both foreign and domestic, change location rapidly. Such operations are sometimes unable to meet their liability to their workers even in the most basic way—in terms of safety and pay. Even though most laws are limited to the United States, there are several options available to prosecutors when problems emerge internationally. These include applying U.S. law internationally; using public international law or U.S. trade law; and writing labor standards into international trade agreements such as NAFTA and GATT. In addition to these formal legal strategies, extralegal strategies include voluntary codes of conduct (corporate, union, and those arising from community organization); worker organizing; consumer strategies; and activist advocacy. Unfortunately, due to the complexity of the global economy, no single strategy is effective all of the time, and most ultimately lack teeth in a global context. However capricious they might be, when consumer awareness and media attention have been focused on the garment industry, they have served to galvanize the effective use of existing statutes—indicating that those outside the industry can have an effect.

Information professionals are a professional group guided by common ethics and goals. This common ground might be effective in setting goals for or partially performing the function of a background institution in accordance with De George's (1993) prescription. Collection development officers often make decisions about the purchase of large quantities of electronic information, and can take the means of information production into account when making collection decisions that might have a direct effect on the industry.

Another example that might be particularly useful with regard to implementing standards for data entry can be found in the forest-products industry. In order to sustain biodiversity—as well as maintain forests for future timber production—trees that originate from ecologically managed forests are now often certified and marked accordingly (Sugal 1996). The background institutions in this case are numerous, consisting of both third-party and national initiatives. When firms regulate themselves, Sugal warns, a “greenwashing” might occur. There is now a widespread demand for certified timber—roughly one-third of the market. However, it has been more difficult to reach individual timber consumers, whose primary considerations remain cost and quality. Certified timber is often purchased by organizations bound by ethical standards in purchasing, such as when
lumber is acquired for public housing. In this case, urban planners and city governments have come to a consensus that an ethics of building in the public interest requires ecologically produced lumber.

Similar systems might be effective in working with the data-entry industry. The importance of involvement from information professionals cannot be underestimated. Until such systems are in place, information professionals could request documentation from their vendors independently. The obvious difficulty here is that evaluation of such documentation is likely to be difficult at best and more likely not always meaningful. However, by requesting documentation from vendors now, the information profession can alert vendors to what the profession considers important and begin to influence the development of a data-entry industry in accordance with long-term objectives: good working conditions for employees and the promotion of sound, sustainable economies based on appropriate mixes of skilled and unskilled labor.

**Summary**

Information organizations such as libraries are actively engaged in the acquisition and dissemination of electronic data. This practice will most likely continue to grow as more collections are converted to electronic formats and acquired in electronic formats. Two factors have traditionally been associated with the conversion of printed materials: cost and data integrity. In this process a third factor has been neglected: the labor conditions under which conversion occurs.

The global economy is prone to inequalities. Features of the global economy include increased interdependence among nations-states, increased competition for cheap labor (among free zones, for instance), and labor abuses. Each of these features has affected the economy of data entry. Data entry is routinely performed offshore in order to reduce costs, data-entry firms often rapidly change location when local costs become too high, and data-entry operators are often the object of work-related health problems and gender discrimination.

Such conditions require an ethical response that accounts for the needs of both producers and consumers. In addition to ethical baselines defined within U.S. law pertaining to worker rights, there are ethical precedents within the information profession, as in the support of access, intellectual freedom, and the representation of diverse views. Principles such as these might be extended to the support of ethical data conversion.

Of the models of regulation surveyed, the kinds of certification and marking as currently carried out in the timber industry might be the most appropriate for electronic information. In addition to making the point of origin of a given unit of information ascertainable at any given time, such a system would perform two functions: (1) in order to be certified, the industry would have to comply with internationally defined labor standards, and (2) consumers within the information professions could be confident that a given electronic product was produced in accordance with those international standards and the ethics of their field. Data marking could very well embody an ethics that accounts for both producers (data-entry operators and owners) and consumers (information professionals and end users).

While OCR might one day present certain limited solutions, it (1) has not yet been widely been used, (2) is considered by practitioners to be ineffective, (3) has costs that are potentially higher for small-scale projects, and (4) does not easily allow for the encoding of metadata elements. Uncritical affirmations of OCR technologies might serve to overshadow the prevalence of low-technology operations.

It would be reckless to suggest that all electronic information produced offshore is done in an unethical manner. Nevertheless, when the nature of the global economy and its susceptibility to abuses are taken into account, it is hard to underestimate the importance of an ethical approach (on the part of information producers and consumers) that supports equitable conversion practices. Increased digitization and information flow, while perhaps being the condition of networks, financial markets, etc., come at a price rele-
vant not only to individuals in the business of providing access or their constituents. The economy of electronic information directly affects the lives of those at a distance from privileged areas where access projects are possible.

**Works Cited**


The Adequacy of the Structure of the National Library of Medicine Classification Scheme for Organizing Pharmacy Literature

Elsa M. López-Mertz

The National Library of Medicine Classification (NLMC) scheme was developed in 1946, using basic ideas from earlier schemes developed for organizing resources in support of teaching medicine and widely used in the United States for classifying information resources including pharmacy and pharmaceutics. The purpose of this study is to examine how the structure of the NLMC accommodates pharmaceutical literature and assess its adequacy. The author analyzed the NLMC numbers assigned to 1,979 monographs with bibliographic records. The analysis revealed that the structure of the NLMC brought together 42% of the literature in the sub-class QV 701-835 while another 41% was scattered throughout the NLMC scheme. Additionally, 17% was classified elsewhere in the Library of Congress Classification (LCC).

Library classifications group documents together through a system of classes arranged in some principle, purpose, or interest (Young 1983). In 1943, the Survey Report on the Army Medical Library, which is now the National Library of Medicine (NLM), recommended the reclassification of the library collection using a modern scheme (Army Medical Library 1948). With this recommendation in mind, the National Library of Medicine Classification (NLMC) was developed. The preliminary edition was published in 1948 and the first edition in 1951.

The NLMC was the most important research activity related to medical classification (Bloomquist 1959). By the 1970s, the trend was clearly one of acceptance of the NLMC as the universal classification scheme for organizing U.S. medical library collections (Hines 1974). Users perceived greater browsability and in some libraries, faculty members recommended the use of NLMC over the older medical classifications. Together with the lack of maintenance of older classifications and the availability of cataloging records nationally in CATLINE or other databases, most libraries associated with teaching of medicine or specializing in other health science professions adopted the NLMC (Scheerer and Hines 1974).

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Since its initial development, the classification scheme has been under continuous revision. At the time when this study was conducted, the Cataloging Division of the NLM was working on the 5th edition of the NLMC, since published late in 1994. Today it is the only up-to-date classification scheme in the United States especially designed for the organization of health sciences literature.

The NLMC is divided into two major parts, which are further divided into 41 main headings. Part I, Preclinical Sciences (QS-QZ), is subdivided into eight main topics, of which the class Pharmacology (QV) is one. Pharmacy and Pharmacuetics is a separate topic in Pharmacology. Part II, Medicine and Related Subjects (W), is subdivided into topics that are arranged hierarchically from general to specific. Beginning with class W Medical Profession, the W class continues through two-letter subdivisions to end with History of Medicine (WZ). A special schedule exists for classifying books published in the 19th century.

Three classification systems were codified specifically for pharmaceutical literature: one by the Eli Lilly Company in 1915, a second one by the Massachusetts College of Pharmacy in 1916, and a third one by the University of Cincinnati (no date available). There is no evidence that any of these classification schemes have been kept up-to-date. Therefore, this study is limited to the NLMC as it is the only up-to-date classification scheme generally used in the United States for the organization of health sciences literature. The purpose of the study is to examine how the structure of the NLMC accommodates pharmaceutical literature, to determine its adequacy, and to provide information on the development of this scheme.

**The Problem**

Fundamentally, the NLMC was developed using basic ideas from Cunningham (1937), a classification scheme developed from the viewpoint of teaching medicine. A team of experts developed the NLMC with representation from many—but not all—of the health science professions. The principal focus of the scheme was medicine, and the original team of experts included representatives from most of the medical specialties, public health, and the basic sciences. There were consultants from the field of nursing, dentistry, geography, and clinical psychology (Army Medical Library 1948). No one represented the field of pharmacy.

The NLMC was designed for use in conjunction with the Library of Congress Classification (LCC) and does not include non-medical subjects in its scope. The NLMC classes QS–QZ and W are not used by the LCC (nor does the NLMC use classes Q–QP used by LCC), allowing the NLMC to develop specificity in the areas of its coverage. The NLMC was designed basically as a broad classification intended to be suitable for both large and small library collections, as well as be adaptable for specialized collections. However, the economics of making local adaptations precludes much activity in this area. The need for research remains because few changes have been made in the NLMC pharmacy subclass while the discipline has changed considerably. And the NLM welcomes suggestions made by researchers in other disciplines.

The study is based in the following research questions:

1. To what extent does the structure of the NLMC accommodate published pharmacy literature?
   a. What are the fundamental categories of published pharmacy literature?
   b. What are the fundamental categories provided in the NLMC for pharmacy literature?
   c. To what extent are the fundamental categories of the NLMC and those of the body pharmacy literature congruent?

2. To what extent is the NLMC adequate for organizing pharmacy literature?
   a. To what extent is the pharmacy literature brought together as a logically organized body of literature by the NLMC?
   b. How logical are the arrays in the
NLMC with regard to pharmacy literature?
c. To what extent is the pharmacy literature scattered in the NLMC?
d. To what extent are the logical arrays in the NLMC congruent with those of the published body of literature?

Others have reported on the adequacy of NLMC in the areas of dentistry, psychiatry, and clinical nursing (e.g., Strauss 1973; Fernando 1984; Caffarel 1978). Strauss identified 29 subjects needed to provide greater specificity in the dentistry class (WU) with 5 subjects later included in the NLMC fourth edition. Caffarel pointed out that 9 clinical nursing specialties were included in one notation (WY 150) with other clinical nursing specialties classified in other notations, which hindered browsability. Again, most of Caffarel’s recommendations were implemented in the following edition of the NLMC. Fernando suggested both the expansion of the Psychiatry class (WM) and the incorporation of modern terminology of psychiatry into the NLMC. A structural overview and examination of the relationship of the NLMC to the Medical Subject Headings (MeSH) was done by Cochrane (1989). To date, no other studies have investigated the adequacy of the NLMC with regard to the organization of pharmacy and pharmaceutical titles.

**Methodology**

The titles used in the study were selected from the bibliographies published by the American Association of Colleges of Pharmacy (AACP) and the Medical Library Association (MLA) between 1955 and 1989 (Medical Library Association Committee on Standards 1955; Zachert and Thomasson 1963; Jackson 1969a & 1969b; Piermatti, Hills, and Snow 1983 and 1986; and Snow 1989). These bibliographies have been used as basic tools in the building of pharmaceutical collections in academic libraries. These bibliographies were compiled by librarians working in colleges of pharmacy from surveys of the faculty members and other people interested in the field. They represent the recommended resources necessary to support the pharmacy discipline. All six were included in the study to ensure the inclusion of titles in all subject areas pertaining to pharmacy.

Using the computer program ProCite, the six bibliographies were merged into a database (Asklepios) containing 3,264 records. A record was created for the latest edition of each title with a note when more than one edition existed. All titles were then searched in CATLINE to obtain the NLM classification number. CATLINE was selected as the source database because the NLMC numbers on these records are assigned only by NLM catalogers, who are also responsible for keeping NLMC current. They are knowledgeable in the use of the system and some level of intercataloger consistency is therefore assumed.

Of the 3,264 records in the Asklepios database, 2,208 (68%) were found in CATLINE. From these, serial titles were eliminated, as the classification number is in part based on format. Also, foreign-language titles, which are peripheral to the NLM collection emphasis on biomedical literature (including pharmacy), are by policy not classified and those records were eliminated (National Library of Medicine 1993). The final study population included 1,979 bibliographic titles (60% of the 3,264 Asklepios records).

**Pharmacy Literature in the NLMC**

Through the call numbers assigned to the records analyzed in the study, five distinct subject groupings in the NLMC were identified. For this research, these groups were viewed as the fundamental categories of pharmacy in the NLMC as determined by the published literature: Group 1, Pharmacology; Group 2, Pre-clinical Sciences other than Pharmacology; Group 3, Medicine and related subjects; Group 4, Bibliographies; and Group 5, Subjects classified in LCC (see table 1).

From the 1,979 records used in this study, 838 titles (42%) were classified in Group 1: Pharmacology. Class QV Pharmacology includes three subclasses: QV
TABLE 1

DISTRIBUTION OF TITLES CLASSED IN NLMC

<table>
<thead>
<tr>
<th>Class Number</th>
<th>Subject</th>
<th>No. of Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>QV</td>
<td>Pharmacology</td>
<td>007</td>
</tr>
<tr>
<td>QV 1–370</td>
<td>19th Century</td>
<td>496</td>
</tr>
<tr>
<td>QV 600–667</td>
<td>Toxicology</td>
<td>041</td>
</tr>
<tr>
<td>QV 701–835</td>
<td>Pharmacy and Pharmaceutics</td>
<td>294</td>
</tr>
<tr>
<td></td>
<td>Total titles in Group 1:</td>
<td>838</td>
</tr>
<tr>
<td>QS</td>
<td>Human Anatomy</td>
<td>021</td>
</tr>
<tr>
<td>QT</td>
<td>Physiology</td>
<td>015</td>
</tr>
<tr>
<td>QU</td>
<td>Biochemistry</td>
<td>125</td>
</tr>
<tr>
<td>QW</td>
<td>Microbiology and Immunology</td>
<td>024</td>
</tr>
<tr>
<td>QX</td>
<td>Parasitology</td>
<td>001</td>
</tr>
<tr>
<td>QY</td>
<td>Clinical Pathology</td>
<td>022</td>
</tr>
<tr>
<td>QZ</td>
<td>Pathology</td>
<td>037</td>
</tr>
<tr>
<td></td>
<td>Total titles in Group 2:</td>
<td>245</td>
</tr>
</tbody>
</table>

Group 2: Preclinical Sciences (other than Pharmacology)

| W            | Medical Profession                           | 45            |
| WA           | Public Health                                | 68            |
| WB           | Practice of Medicine                         | 37            |
| WC           | Infectious Diseases                          | 07            |
| WD           | Deficiency Disease . . . Aviation and Space Medicine | 34 |
| WE           | Musculoskeletal System                       | 05            |
| WF           | Respiratory System                           | 04            |
| WG           | Cardiovascular System                        | 10            |
| WH           | Hemic and Lymphatic System                   | 08            |
| WI           | Gastrointestinal System                      | 11            |
| WJ           | Urogenital System                            | 03            |
| WK           | Endocrine System                             | 34            |
| WL           | Nervous System                               | 26            |
| WM           | Psychiatry                                   | 46            |
| WN           | Radiology                                    | 45            |
| WO           | Surgery                                      | 09            |
| WP           | Gynecology                                   | 04            |
| WQ           | Obstetrics                                   | 11            |
| WR           | Dermatology                                  | 14            |
| WS           | Pediatrics                                   | 09            |

(Continued on next page)
TABLE I (cont.)

<table>
<thead>
<tr>
<th>Class Number</th>
<th>Subject</th>
<th>No. of Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>WT</td>
<td>Geriatrics. Chronic Disease</td>
<td>19</td>
</tr>
<tr>
<td>WU</td>
<td>Dentistry. Oral Surgery</td>
<td>01</td>
</tr>
<tr>
<td>WV</td>
<td>Otorhinolaryngology</td>
<td>01</td>
</tr>
<tr>
<td>WW</td>
<td>Ophthalmology</td>
<td>10</td>
</tr>
<tr>
<td>WX</td>
<td>Hospitals and Other Health Facilities</td>
<td>20</td>
</tr>
<tr>
<td>WY</td>
<td>Nursing</td>
<td>04</td>
</tr>
<tr>
<td>WZ</td>
<td>History of Medicine</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total titles in Group 3:</td>
<td>515</td>
</tr>
</tbody>
</table>

**Group 4: Bibliographies**

| ZQV 1–370   | General Pharmacology             | 11            |
| ZQV 600–667 | Toxicology                       | 01            |
| ZQV 701–835 | Pharmacy and Pharmaceutics       | 16            |
| ZQZ         | Pathology                        | 01            |
| ZSF         | Veterinary Medicine              | 01            |
| ZW–ZWZ      | Medical Profession...            | 11            |
|             | History of Medicine              |               |
|             | Total titles in Group 4:         | 41            |

**Group 5: Library of Congress Classification**

| G–P         | Geography... Language and Literature | 015            |
| Q           | Science                              | 235            |
| S           | Agriculture                          | 041            |
| T           | Technology                           | 031            |
| U           | Military Medicine                    | 001            |
| Z           | Bibliography. Library Science        | 018            |
|             | Total titles in Group 5:             | 340            |
|             | Total number of titles               | 1,929          |

1–370 General Pharmacology, consisting of 496 titles (60% of the 838 titles); QV 600–667 Toxicology, consisting of 41 titles (5%); and QV 701–835 Pharmacy and Pharmaceutics, consisting of 294 titles (35%).

Works pertaining to pharmacy are in the Pharmacology class although the placement under subclass varies. Literature about the pharmacist is located under Pharmacy as a Profession in the form number QV 21, the subclass General Pharmacology, instead of QV 721, the subclass Pharmacy and Pharmaceutics. (In the NLM, the first 39 numbers of a class or subclass are form numbers, with some exceptions—one of which is seen in the QV 701–835 (Pharmacy and Pharmaceutics subclass), where the lack of form numbers puts the classification of pharmacists in QV21 instead of QV721.) “Pharmacist” and “pharmacologist” are different professional categories (there is no need to be a pharmacist to become a pharmacologist), yet in the NLM 4th revised edition there is no separate space for the pharmacologist.

Also, literature about Education, Schools and Colleges, and Research in the field of pharmacy, is located under the form
numbers for Pharmacology: QV 18, QV 19, QV 20, and QV 20.5; instead of QV 718, QV 719, QV 720, and QV 720.5 in the Pharmacy and Pharmaceutics subclass. Because not all form numbers are included under QV 701–835 Pharmacy and Pharmaceutics, works pertaining to the field of pharmacy are located under Pharmacology.

Two hundred and forty-five records (13%) were classified in Group 2: Preclinical Sciences. From this total, 51% were under Biochemistry (QU), 6% under Human Anatomy (QS), 9% under Physiology (QT), 9% under Clinical Pathology (QY); and 15% under Pathology (QZ). Five hundred and fifteen records (26%) were classified in Group 3: Medicine and Related Subjects. From this group 13% of the records were classified in Public Health (WA); 9% were classified under Medical Profession (W), 9% in Radiology (WN), 9% under Psychiatry (WM), and 7% in the Practice of Medicine (WB). Works about nuclear pharmacy are placed under Radiology (WN), and those about drug addiction and drug abuse are located under Psychiatry (WM). Books about drug therapy are classified in Therapeutics (WB). Books classified in other classes rank between 0.02% to 6%. In the NLMC, works in the use and treatment of a particular disease are classified with the disease; for example, works in the anatomy, histology, embryology, physiology, and biochemistry of a part of the body are classified with the body part instead of placing them under the general class or sub-class for these topics (National Library of Medicine 1981). Works on vitamins are classified in Biochemistry (QU), and works on endocrine preparations are located in classes Urology (WJ), Endocrinology (WK), and Gynecology (WP).

Group 4 includes bibliographies. All those bibliographies classified within the scope of the NLM take the class number from the subject, prefixed by a capital Z (National Library of Medicine 1981). 41 titles (2%) were classified in Group 4: Bibliographies. Of this total, 16 titles (59%) were classified in Pharmacy and Pharmaceutics (ZQV 701–835). Eleven titles (27%) in Pharmacology (ZQV 1–370). The remaining 34% were classified under Z following the instructions in the NLMC for the classification of bibliographies. Group V includes materials classified using LCC. It contained 341 records (17%). Two hundred and thirty-five (69%) were classified in Science (Q). There is a very close relationship between the field of chemistry and the field of pharmacy, so it is logical that any pharmacy collection would include a large number of books from the field of chemistry. Forty-one (12%) were in Agriculture (S), 31 titles (10%) in Technology (T), 17 titles (6%) in Bibliography, Library Science (Z), and 11 titles (3%) were in Social Science (H). The remaining 5 titles were in Geography (G), Political Science (J), Law (K), Language and Literature (P), and Military Medicine (U).

Classification by Pharmacy Curricula

For this study, the universe of knowledge has been defined as pharmacy. The subjects taught in schools of pharmacy served as the basis for a model classification of the pharmacy literature, against which the NLMC’s organization of the pharmacy literature was compared. The extent of the structural adequacy of the NLMC for organizing pharmacy was determined by the extent to which the NLMC was congruent with the model developed from subjects taught in the schools of pharmacy.

The Roster of faculty and paraprofessional staff (AACP 1992–93) was the source used to identify subjects taught in pharmacy, which are listed below in the topical order used in the reports on pharmaceutical curricula published in 1952 and 1967, those of current bulletins of U.S. pharmacy schools, and the definition given by the National Association of Boards of Pharmacy about the practice of pharmacy. The Roster identifies nine academic disciplines, most of them divided into different subjects:

1. Libraries and Educational Resources
2. Liberal Arts
3. Biological Sciences: Anatomy, Histology, Physiology, and Pathology
4. Medicinal and Pharmaceutical
Chemistry: Pharmacognosy, Biochemistry, Biomedical chemistry, Inorganic pharmaceutical chemistry, Molecular and quantum biology, Natural product chemistry, Pharmaceutical analysis, and Physical and medicinal chemistry

5. Pharmacology: Clinical pharmacology, Molecular pharmacology, and Toxicology

6. Pharmaceutics and Pharmacy: Agricultural pharmacy, Animal health pharmacy, Biopharmaceutics, Cosmetic science, Industrial pharmacy, Manufacturing pharmacy, Pharmacokinetics, Physical pharmacy, Veterinary pharmacy, and Veterinary science

7. Pharmacy Administration: Communication, Health care administration, Institutional and community pharmacy, Marketing, Pharmaceutical economics, Pharmacy accounting, Pharmacy jurisprudence, and Social-behavioral pharmacy

8. Pharmacy Practice: Clinical pharmacy, Community practice, Drug information, Institutional practice, Nuclear pharmacy and radiopharmacy, Pharmacy ethics, and Pharmacy history

9. Continuing Professional Education

These subjects were verified in the alphabetical list of the NLMC and assigned the appropriate classification notation. The 1993 edition of MeSH and the MeSH Tree Structure were used for assistance in this process. The purpose for assigning classification notations to the list of academic disciplines and their specific subjects was to enable a comparison between the AAAP list of subjects and those in the NLMC. This made it possible to determine how adequately the structure of the NLMC accommodates the subjects found in AAAP. Where the subjects could not be found in the NLMC, the subjects were searched as keywords in CATLINE to determine what titles were retrievable under those subjects and where they were classified in the NLMC.

From this work, the following mapping was constructed to show where individual titles in the 9 subjects (academic disciplines) of the AACP were classified in the NLMC (see table 2).

An examination of the 1,979 titles analyzed in the study reveals that 28 titles (1.4%) supported the Libraries and Educational resources category. The Liberal Arts category provides the general educational background needed by the future pharmacist, including the courses from the natural sciences. Sixteen percent (308 titles) fell in this category. Nearly half of these were on chemistry. The Biological Sciences category provides the basic knowledge needed by the pharmacist to understand the action of drugs in the body. Eleven percent (209 titles) fell in this category. Two hundred titles (10%) were in the Medicinal and Pharmaceutical Chemistry category; 358 titles (18%) were in the Pharmacology category; 111 titles (6%) were in Pharmaceutics and Pharmacy; 191 titles (10%) were in Pharmacy Administration; and 504 titles (25%) were in Pharmacy Practice. Seven titles (0.003%) fell in the Continuing Professional Education category. Eight percent (165 titles) did not fall into any of the categories, and were located under a miscellaneous category. This category included general titles that do not support a specific discipline.

Summary and Conclusions

This study inaugurates research examining where the literature on pharmacy and pharmaceutics is classified in the NLMC. An analysis of this classification system was made to determine whether it adequately accommodates the body of literature relating to the pharmacy field, and if the NLMC organizes it adequately. Using as the frame the academic disciplines identified in pharmaceutical curricula, 10 fundamental categories were established that cover all the published pharmacy literature. Five of these categories were identified in the NLMC for the classification of pharmacy literature. According to the classification notation assigned to the titles supporting each subject in each of the pharmacy disciplines, a comparison
<table>
<thead>
<tr>
<th>Call Number</th>
<th>Subjects from AACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>QV 18–19, Z</td>
<td>Libraries and Educational Services</td>
</tr>
<tr>
<td>G, H, J, K, P, Q, Z, T, QW, QX</td>
<td>Liberal Arts</td>
</tr>
<tr>
<td>Q 1–132, WE, WG, WH, WI, WJ, WK, WL, WP, WV</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>Q 504–539, WL</td>
<td>Anatomy</td>
</tr>
<tr>
<td>QT, WE, WF, WG, WH, WI, WJ, WK, WL, WP, WQ, WR, WS, WV</td>
<td>Histology</td>
</tr>
<tr>
<td>QY, QZ, ZQZ</td>
<td>Physiology</td>
</tr>
<tr>
<td>QV 744</td>
<td>Medicinal and Pharmaceutical Chemistry</td>
</tr>
<tr>
<td>QV 752</td>
<td>Pharmacognosy</td>
</tr>
<tr>
<td>QU</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>QU</td>
<td>Biomedical Chemistry</td>
</tr>
<tr>
<td>QV 744</td>
<td>Inorganic Pharmaceutical Chemistry</td>
</tr>
<tr>
<td>QV 744, 752, 766–770.1</td>
<td>Molecular and Quantum Biology</td>
</tr>
<tr>
<td>QV 744</td>
<td>Natural Product Chemistry</td>
</tr>
<tr>
<td>QV 744</td>
<td>Pharmaceutical Analysis</td>
</tr>
<tr>
<td>QV 1–370</td>
<td>Physical and Medicinal Chemistry</td>
</tr>
<tr>
<td>QV 38</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>QV 38</td>
<td>Clinical Pharmacology</td>
</tr>
<tr>
<td>QV 600–667, WD 400, WD 500, ZQV</td>
<td>Molecular Pharmacology</td>
</tr>
<tr>
<td>QV 701–835</td>
<td>Toxicology</td>
</tr>
<tr>
<td>S, SB</td>
<td>Pharmacy Administration</td>
</tr>
<tr>
<td>QV 38</td>
<td>Agricultural Pharmacy</td>
</tr>
<tr>
<td>QT 275, WA 744, TP</td>
<td>Animal Health Pharmacy</td>
</tr>
<tr>
<td>QV 736, HD 9665, T 55</td>
<td>Biopharmaceutics</td>
</tr>
<tr>
<td>QV 736, 771, 773</td>
<td>Cosmetic Science</td>
</tr>
<tr>
<td>QV 38</td>
<td>Industrial Pharmacy</td>
</tr>
<tr>
<td>QV 736</td>
<td>Manufacturing Pharmacy</td>
</tr>
<tr>
<td>SF</td>
<td>Pharmacokinetics</td>
</tr>
<tr>
<td>SF, ZSF</td>
<td>Physical Pharmacy</td>
</tr>
<tr>
<td>QV 704, W 275</td>
<td>Veterinary Pharmacy</td>
</tr>
<tr>
<td>QV 21</td>
<td>Veterinary Science</td>
</tr>
<tr>
<td>W, WA, WS 29, WT 30, WX</td>
<td>Pharmacy Administration</td>
</tr>
<tr>
<td>QV 737, WX 179</td>
<td>Communication</td>
</tr>
<tr>
<td>QV 736</td>
<td>Health Care Administration</td>
</tr>
<tr>
<td>QV 704, TP</td>
<td>Institutional and Community Pharmacy</td>
</tr>
<tr>
<td>QV 736</td>
<td>Marketing</td>
</tr>
<tr>
<td>QV 736</td>
<td>Pharmaceutical Economics</td>
</tr>
<tr>
<td>QV 736</td>
<td>Pharmaceutical Socioeconomics</td>
</tr>
<tr>
<td>QV 736</td>
<td>Pharmacy Accounting</td>
</tr>
</tbody>
</table>

(Continued on next page)
### TABLE 2 (cont.)

<table>
<thead>
<tr>
<th>Call Number</th>
<th>Subjects from AACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>QV 32–33.1</td>
<td>Pharmacy Jurisprudence</td>
</tr>
<tr>
<td></td>
<td>Social and Behavioral Pharmacy</td>
</tr>
<tr>
<td>QV 13–26, QV 701–835</td>
<td>Pharmacy Practice</td>
</tr>
<tr>
<td>QV 5, 38, 39, QV 704, WB 330, WX 179</td>
<td>Clinical Pharmacy</td>
</tr>
<tr>
<td>QV 737</td>
<td>Community Pharmacy</td>
</tr>
<tr>
<td>HV, WD 320, WM 270–276, WM 286–88, WM 404</td>
<td>Drug Information</td>
</tr>
<tr>
<td>QV 20, WX 179</td>
<td>Institutional Practice</td>
</tr>
<tr>
<td>WN</td>
<td>Nuclear Pharmacy/Radiopharmacy</td>
</tr>
<tr>
<td>QV 21</td>
<td>Pharmacy Ethics</td>
</tr>
<tr>
<td>QV 711–11.1</td>
<td>Pharmacy History</td>
</tr>
<tr>
<td>WB 330, 340, 342, 354, WW 166</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>QV 19–20</td>
<td>Continuing Professional Education</td>
</tr>
</tbody>
</table>

between the fundamental categories in the NLMC for the pharmacy field and in the fundamental categories of the published pharmacy literature shows this correlation:

Forty-two percent of the titles have been brought together by the structure of the NLMC under Pharmacology (QV); 41% are scattered throughout the NLMC; and 17% are under the LCC. General works supporting the Biological Sciences were classified in the Preclinical Sciences. The works on anatomy, histology, and physiology of a part of the body were classified with the part of the body as stated in the NLMC. Most of the works supported the five core disciplines in the field of pharmacy: Medicinal and Pharmaceutical Chemistry, Pharmacology, Pharmacy Administration, Pharmacy Practice were classified scattered through the NLMC. Few sources were classified under the LCC call numbers. The main problem is that the works supporting specific topics from the field of pharmacy were classified far away from the sub-table QV 701–835. For example, the works on Clinical Pharmacy, one of the most important topics in the field today, were classified under WB 330. The works on the Practice of Pharmacy were split; some of them were in WX 179, while others were in QV 736.

The original subclass developed in the NLMC (preliminary edition) for the organization of pharmacy literature was separated from the Pharmacology class. So pharmacy and pharmacology were recognized as different fields. According to the NLMC 4th revised edition, class QV could be interpreted as Pharmacy or as the Practice of Pharmacology. Pharmacology is an important basic science for all health science professionals, but each area studies it for different purposes. For example, nurses need to know pharmacology because they administer drugs, while pharmacists study it to license drugs. Haddad (1995, 3) defined pharmacy as “the art and science of preparing and dispensing medications and the provision of drug and related information to the public. It involves the interpretation of prescription orders; the compounding, labeling, and dispensing of drugs and devices; drug product selection and drug utilization reviews; the responsibility for patient monitoring and intervention and the provision of cognitive services.” According to the definition of pharmacy, professionals in this field have responsibilities that can be performed only by those licensed in pharmacy.

The current structure in the NLMC identifies Pharmacology as the class and Pharmacy and Pharmaceutics as one subclass under Pharmacology. According to
TABLE 3

COMPARISON OF CATEGORIES

<table>
<thead>
<tr>
<th>Fundamental Categories in the Published Pharmaceutical Literature</th>
<th>Fundamental Categories in the NLMC for Pharmacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology (QV 1–835)</td>
<td>Libraries/Educational Resources</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutical/Medicinal Chemistry</td>
</tr>
<tr>
<td></td>
<td>Pharmacology</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutics</td>
</tr>
<tr>
<td>Preclinical Sciences (QS–QU, QW–QZ)</td>
<td>Pharmacy Administration</td>
</tr>
<tr>
<td></td>
<td>Pharmacy Practice</td>
</tr>
<tr>
<td></td>
<td>Continuing Professional Education</td>
</tr>
<tr>
<td></td>
<td>Liberal Arts</td>
</tr>
<tr>
<td></td>
<td>Biological Sciences</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutical Medicinal Chemistry</td>
</tr>
<tr>
<td>Medicine/Related Subjects (W–WB, WE–WL, WP–WQ)</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td></td>
<td>Pharmacology</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutics</td>
</tr>
<tr>
<td></td>
<td>Pharmacy Administration</td>
</tr>
<tr>
<td></td>
<td>Pharmacy Practice</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td>Biological Sciences</td>
</tr>
<tr>
<td></td>
<td>Pharmacology</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutics</td>
</tr>
<tr>
<td></td>
<td>Pharmacy Administration</td>
</tr>
<tr>
<td></td>
<td>Pharmacy Practice</td>
</tr>
<tr>
<td></td>
<td>Libraries/Educational Resources</td>
</tr>
<tr>
<td></td>
<td>Liberal Arts</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Subjects from LCC (A–QL, S–Z)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

the definition of the pharmacy profession and the topics in the pharmacy curricula, Pharmacology is one of the subjects of Pharmacy as a universe of knowledge. Pharmacy, then, should be viewed in a different position, as the class Pharmaceutics and Pharmacology as a subclass under Pharmaceutics. Pharmacy should have the same place that other health science professions have—with pharmacology as a basic science for all of them.

The ideal structure of a classification system for Pharmacy should be one accommodating the literature on Medicinal and Pharmaceutical Chemistry, Pharmaceutics, Pharmacy Administration, and Pharmacy Practice as a whole—in proximity to Pharmacology as an important basic science. The analysis reveals that 58% of the literature is classified outside Pharmacology (QV). It might be concluded that the arrays in the NLMC are not logical for organizing literature for teaching pharmacy. The state of affairs is understandable, given that the NLMC was designed for teaching medicine, with pharmacy as a supporting discipline. Nevertheless, the structure renders the system problematic for organizing pharmacy literature for pharmacy library users. Pharmacy subjects are placed in the structure as they support pharmacology, a basic science in the teaching of medicine.

In summary, the structure of the NLMC does not accommodate pharmacy-published literature because the two sets
of fundamental categories are not congruent. The NLMC is considered inadequate for organizing pharmacy literature because 58% of it is scattered to the NLMC or in the LCC. This has been the first study analyzing how the NLMC accommodates pharmacy literature. Additional research is needed to take a decision on improving subclass QV 701-835 or creating a new system for this body of knowledge. As Chan (1990) pointed out, the NLMC deserves serious study. Studies should be done in collaboration between classifiers and pharmacists, because classifiers are the experts in classification while pharmacists are the experts in Pharmacy.

RECOMMENDATIONS

The pharmacy field has evolved from a chemistry-oriented bachelor's degree program to a clinical pharmacy program with the advent of a clinical orientation to the profession. Since the 1960s, the strong emphasis in pharmacy schools has been toward the Doctor in Pharmacy degree and the clinical pharmacy programs. The clinical pharmacy program was created in response to medical reports on adverse drug reactions, drug-drug interactions, food-drug interactions, and medication errors in hospitals. The clinical pharmacist, then, became the drug specialist providing consultant services to the physicians who were overwhelmed by the large amount of information on drugs (Biles 1983).

Additional research is necessary to add to the body of knowledge regarding the organization of pharmaceutical literature and to provide a theoretical basis for improving access to information resources in

TABLE 4
AACP AND NLMC CLASSIFICATION CATEGORIES

<table>
<thead>
<tr>
<th>Fundamental Categories in the Published Pharmaceutical Literature</th>
<th>Fundamental categories in the NLMC for Pharmacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library/Educational Resources</td>
<td>Subjects from the LCC (A-QL, S-Z)</td>
</tr>
<tr>
<td></td>
<td>Preclinical Sciences (QW)</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>Subjects from the LCC (A-QL, S-Z)</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>Preclinical Sciences (QS-QT, QY-QZ)</td>
</tr>
<tr>
<td>Medicinal/Pharmaceutical Chemistry</td>
<td>Pharmacology (QV 1-370, QV 744)</td>
</tr>
<tr>
<td></td>
<td>Preclinical sciences (QU)</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>Pharmacology (QV)</td>
</tr>
<tr>
<td></td>
<td>Medicine/related subjects (All those discussing drugs)</td>
</tr>
<tr>
<td></td>
<td>Bibliographies (ZQV)</td>
</tr>
<tr>
<td>Pharmaceutics</td>
<td>Pharmacology (QV 701-835)</td>
</tr>
<tr>
<td></td>
<td>Medicine and Related Subjects (All those discussing therapeutics)</td>
</tr>
<tr>
<td></td>
<td>Bibliographies (ZQV)</td>
</tr>
<tr>
<td>Pharmacy Administration</td>
<td>Pharmacology (QV 21, QV 704)</td>
</tr>
<tr>
<td></td>
<td>Medicine and Related Subjects (W, WA)</td>
</tr>
<tr>
<td></td>
<td>Bibliographies (ZQV)</td>
</tr>
<tr>
<td>Pharmacy Practice</td>
<td>Pharmacology (QV 701-835)</td>
</tr>
<tr>
<td></td>
<td>Medicine and Related Subjects (W, WA)</td>
</tr>
<tr>
<td></td>
<td>Bibliographies</td>
</tr>
<tr>
<td>Continuing Professional Education</td>
<td>Pharmacology (QV 18-20.5)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Medicine and Related Subjects (W, WA)</td>
</tr>
<tr>
<td></td>
<td>Subjects from LCC (A-QL, S-Z)</td>
</tr>
</tbody>
</table>
this field. On the other side, the vocabulary used in a classification scheme facilitates access to the information. It is necessary that a research study be undertaken to analyze the currency, accuracy, and specificity of the vocabulary used in the NLMC, particularly in relation to pharmaceutical subjects. Professionals from the field of pharmacy believe that the vocabulary used in the NLMC is not representative from the field today (Adrover 1994; Pérez, Mertz 1994). The vocabulary from the pharmacy field needs to be analyzed and a thesaurus and database developed and coded to MeSH—the standard vocabulary used in the health sciences field.

There is no definitive body of knowledge that documents the organization, standards, and tools used in pharmacy libraries. A survey is needed to determine how pharmacy libraries organize their collections and how they use the NLMC or other specialized classification systems for information storage and retrieval of pharmacy literature. This information would determine the need for the development of a specialized classification, perhaps coded to the NLMC, for pharmacy libraries.

Studies in classification are important to increase the effectiveness of classification schemes. If there is no feedback from libraries using a specific classification scheme or is there no research, the system could lose its efficiency. Also, though the NLMC is close to 50 years old and is the only major classification scheme in the United States specifically for the organization of the health sciences literature, very few studies have been reported in the literature. The NLMC deserves such research. There is no doubt that users will benefit and information services would be greatly improved.

Note: After this study was completed in 1994, the fifth edition of the NLMC was published and readers are encouraged to examine it. Class QV contains a few changes. In the subclass Pharmacy and Pharmaceutics, form numbers for Classification, Nomenclature, Terminology (QV715), Atlases and Pictorial Works (QV717) and Directories (QV722–711.2), and Jurisprudence (QV732–22.1) were added. QV 21 is now used to classify the works on Pharmacy as a Profession and Pharmacology as a Profession. A number for Materia medica (QV760) was also added. Although these changes resolve some problems pointed out in the study, others still need work.

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Notes on Operations

Managing Acquisitions in a Changing Environment: From Coping To Comfort

Cynthia Gozzi

Acquisitions departments, like other parts of technical services, have been forced by a variety of internal and external forces to change dramatically in recent years, and there is every indication that the trend will continue and even accelerate in the future. The forces are many, and include the merging of acquisitions, cataloging, and sometimes interlibrary borrowing; a migration to team-based management; greater use of flexible work assignments; greater attention to workflow and cost/benefit analysis and redesign; and the building of partnerships with utilities and vendors to develop new services and experiment with outsourcing options. The challenges and pressures on managers and staff alike to accommodate or take advantage of these changes and add new services, while maintaining the existing ones, are real and sometimes overwhelming. All too often the only life-raft thrown to them is a crash course in stress management, when what would help most are programs to aid the understanding of how to cope with a process of change that has no foreseeable end; how to maintain a feeling of worth, security, motivation; and how to maintain control when the familiar is being questioned, fractured, rearranged, or replaced.

During a well-attended and lively program presented on Monday, July 8, 1996, at the American Library Association's Annual Conference in New York the topic of managing a constantly changing acquisitions environment was explored. The program was sponsored by the Library Administration and Management Association's Systems and Services Section, Acquisitions Systems Committee, cosponsored by the Association for Library Collections and Technical Services Acquisitions Section's Acquisitions Discussion Group, and generously supported by Academic Book Center.

What inspired me to develop this conference program and publish the papers from it was the management challenge associated with entering a period of pervasive and dramatic change in the J. Murrey Atkins Library at the University of North Carolina at Charlotte. The changes began with the merger in 1993 of the Library, Media Services, and Computing Services organizations under the leadership of an associate vice-chancellor for library and information services (the former library director). They accelerated with the funding of a major library expansion and renovation project to be completed in 1999. Both of these events became catalysts for a major restructuring of programs and services, with changes in position for many staff members, in supervision, in coworkers, and in job responsi-

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bilities for many others. Simultaneously, we undertook the review and revision of most core processes. While the effects have been felt throughout the organization—not just in Technical Services—the latter is now operating in a significantly altered environment. These changes include:

- Two previously very separate departments (Acquisitions and Cataloging) have been combined into an integrated Technical Services unit.
- The management structure has been flattened significantly.
- Positions have been transferred out of Technical Services to other parts of the organization.
- The technical infrastructure has been reviewed and expanded.
- The outsourcing of some functions is being explored.
- Service and support expectations of Technical Services have been reviewed and redefined.
- Communication channels to and from other units have been strengthened.

While the changes are still unfolding, we know that along the way we have employed some managerial techniques that we will use again in the future and others that we will not repeat or will alter. Techniques that have worked well include:

- A series of workshops offered by Dr. Buch of the Psychology Department on coping with change,
- The open weekly sessions at which senior managers share information, answer questions, and listen to concerns,
- Updates in the library’s electronic newsletter and via the listserv,
- The open door policy of the Human Resources manager, which has made her available to discuss changes and concerns one-on-one,
- Celebrations of significant milestones,
- Consultations between the leadership and external experts to plan and facilitate the change process,
- The use of a number of task forces to gather staff input and critique suggested changes,
- A genuine effort to match people with new jobs and tasks in ways that best utilize individual skills, interests, and needs,
- Significant investments in training,
- Attention to classification issues resulting from changes in responsibilities,
- Allowing support staff to be in the forefront of the change processes, and
- The conscious use of a new “language” to describe new concepts.

In retrospect, we should have recognized sooner some things that did not advance our cause in the right direction or inhibited progress. We placed too much focus on the structural aspects of change and too little on the cultural aspects. We did too little and we did it too slowly—in other words, we proceeded too cautiously and prolonged uncertainties unnecessarily. In the old culture, resistance had been used effectively to block change, and firm enough messages were not sent that, this time, it would no longer obtain the desired result. Altogether, we underestimated the impact of the old culture. We did not involve the rank-and-file staff as early as we should have, and we had progressed quite a bit into the changes before we developed an effective schedule and mode for communicating with staff. In addition, our promotion efforts for making the changes were neither aggressive nor upbeat enough—they should have projected more excitement, more creativity, and more fun.

The keynote address for the conference program was delivered by Kim Buch, an organizational psychologist and associate professor from the University of North Carolina at Charlotte, and the final presentation was by David Goble from North Carolina State University Library. Papers based on these two presentations have been published in Library Administration and Management, vol. 11, no. 3, Summer 1997. Between these two addresses were four short presentations by four acquisitions librarians who described the changes that have taken place in the Acquisitions Departments of their libraries in recent years. These four case studies are the basis for the following articles in which the writers summarize the changes that occurred and describe what they perceive as the most positive and negative aspects for the acquisitions
staff, what the institution did to help staff adjust, and what advice they would give others in similar circumstances.

Without exception the program presenters emphasised that change is not a fleeting phenomenon from which we will emerge, either to return to the nostalgic predictability of times past or to enter a new period of welcome calm. It behooves all of us, therefore, to benefit from the experiences of our colleagues and to consider their advice. As one point of departure for continuing the dialogue, we present the following four real-life adventures of colleagues Douglas Duchin from Baruch College Library, Peter Kingsley from New York University, Randy Call from Detroit Public Library, and Christian Boissonnas from Cornell. I suspect we can all put our feet in their shoes.

TECHNOLOGY AND MANAGEMENT IN LIBRARY AND INFORMATION SERVICES

The integration of technology into library operations has greatly changed the manner in which tasks are accomplished and by whom. Technology and Management in Library and Information Services focuses on the management of technology rather than the technology itself, since it is the manner in which new tools are used that will make the difference in contemporary libraries.

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Moving Right Along: Changes in Staffing, Functions, Workstation Setup, and Personnel

Douglas Duchin

Changes in staffing, functions, workstation setup, and personnel training in the Technical Services Department of the Newman Library at Baruch College of the City University of New York over the last ten years are reviewed. In particular, the development of an integrated workstation, the expansion of job responsibilities, and the retraining of personnel are discussed.

On the continuum of library technical services, we're moving right along. In the last ten years at Newman Library, we've moved from a dependence on local practice to a sense of community and a new emphasis on expediency. Not only have we begun using the new technological tools, but we have been imbued with a feeling of team playing, a new sense of production, and a we're-all-in-this-together attitude. What's happening here may be a reflection of what's happening throughout the information-processing industry. The emphasis on speed, production, and patrons' needs has given us a new focus, and our automated workstations have given us the tools to achieve these goals.

In the last ten years we have come to rely not only on the national databases, such as OCLC Online Library Computer Center, Inc., and the Library of Congress (LC), but even more on clerical interpretation and manipulation of data. We've developed more speed, more cooperation with reference and circulation, and more acceptance of their input. Along the way we picked up a lot more self-assurance as team players and got rid of a lot of the ivory-tower image.

City University of New York, of which Baruch College is a part, brought up the NOTIS system in 1988, primarily with the online public catalog available, and called it CUNY+. It was a major changing point in our lives, although I speak of an event that took place a couple of years before I arrived. At that point, in 1988, our Technical Services Department consisted of a couple dozen people handling catalog cards and paper orders in a fairly standard manner. Our orders were transmitted electronically through OCLC, which also kept accounts for us. The department was highly structured and compartmentalized. Catalogers cataloged. Acquisitions staff acquired. Few, if any, staff members had overlapping responsibilities or training—although almost all could perform copy cataloging.

The staffing consisted, specifically, of 6 full-time professionals—three catalogers, 1 serials librarian, 1 acquisitions librarian, and 1 head of Technical Services.

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Most had no responsibilities outside of Technical Services. In addition, there were at least 12 full-time clerical staff and many student assistants. The organization was structured, which meant that input and output were standardized and predictable. Statistics were kept manually, a backlog in cataloging had developed, and serials payment tracking was vague.

**Systems Changes**

Changes in personnel, machinery, or even surroundings often have the happy ability to grease the wheels and get things moving in more productive ways. Thanks to those changes, only 9 people, including 3 professional librarians, handle almost as much material as it took two dozen to handle 8 years ago. We handle it faster, too.

The first and probably most visible change was the introduction of the NOTIS Generic Transfer and Overlay (GTO), which ran on an IBM PS/2 and had serial connections to OCLC, to NOTIS, and to the GTO through a controller. The GTO allowed for instant transfer of bibliographic information from OCLC to our NOTIS system, cutting in half both the number of workstations and the processing time needed.

Ten years ago, acquisitions was limited to using only LC-cataloged or -modified data as the basis for ordering. As it became apparent that this was a bottleneck, we retrained acquisitions staff to locate, recognize, and use any reasonable record on OCLC. For materials not on OCLC, we decided to place all responsibility for creating a preliminary bibliographic record at the acquisitions level. The staff were taught, in a very short period of time, to identify essential elements of the order request and to enter them in MARC-tagged format. Since the cataloging staff researched every title on OCLC upon receipt, almost any level of cataloging would have done for an acquisitions record. In spite of this sudden departure from standard practice, the world did not come to an end.

Then we moved into an incredible new building in 1994, and when the dust settled, we found that we had fully integrated automated workstations and a head of Technical Services, Ida Lowe, who was a strong advocate of cross-training and integrated functions. Under Lowe's direction, all workstations were designed to be standard and interchangeable, which meant that staff members did not have to move from their desks to learn a new function and integrate it into the workflow. Much of what happened did so at the university level, not at the library level, as the university provided us with the necessary resources. We cut our reliance on OCLC as much as possible and began accepting records from other libraries available on our system. The university made the Library of Congress Resource File (LCRF) available at every workstation, giving us a pretty good bibliographic record for 95% of the books we ordered, without our having to tap into another utility. Additionally, the university provided us with a tape-loaded access to OCLC, which helped speed the process of uploading our new acquisitions into OCLC on tape and cut personnel costs. Currently, every staff workstation in the library has access to our own online catalog, OCLC, our CD-ROMs (including BIP Plus), the LCRF, the Internet (including the Web, e-mail, gophers, and FTP), electronic publisher catalogs, vendor databases, and virtually every major library catalog in the world through a Windows environment. The new fully integrated workstation provides all the tools of the trade and makes the job easier, more accurate, and much faster. The workstation also provides services that enhance personal growth and education such as research indexes and abstracts, some full-text materials, and so on, which are used by the staff in furthering their own formal education.

In addition, since our selectors use these tools as well, almost every order that comes to us has the potential of providing us with excellent bibliographic data. One of the next steps is to electronically link that order directly into the acquisitions process and perhaps provide a Web-accessed materials order form and make it available to all faculty and students.
PERSONNEL CHANGES

While we updated our electronic wizardry, we also focused on personnel—
their attitudes, training, reporting responsibilities, and authority. Our new and
enlarged public service area had absorbed not only some professional librarians from
our Technical Services staff but clerical staff as well. Under the head of Refer-
ence, we developed a staff of "rovers" and "reference assistants." These were Tech-
nical Services staff members who assisted patrons within carefully defined param-
eters in the library's public service areas. By using the end products of their Technical
Services work alongside patrons, the staff became very aware of the impact of their
work. Incomplete or confusing information suddenly became very obvious. Work
well done became a pleasure to use. The small staff in Technical Services expanded
their horizons and knowledge, while the distinction between Public and Technical
Services was blurred.

Regular workflow, cash flow, and book selection can create a pig-in-the-python ef-
fect in acquisitions and cataloging. The resulting fluctuation in the volume of work
creates a need for a flexible staff who can perform several functions. To develop this
staff, we focused on the interrelationship of the roles of acquisitions and cataloging and
emphasized the similarities in selecting the perfect record whether it was for acquisi-
tions or for cataloging. A program for basic copy cataloging training was developed,
along with a work manual. At the completion of the training, and with only two of the
staff working part-time at copy cataloging, we were back up to speed within a month.

I feel strongly that we were able to do this so well because of changes in attitude.
We made sure that supervisors were accessible to staff at all times. We made sure
that staff members were aware of patron needs. We provided the best possible tools
for moving materials quickly, and we emphasized speed without loss of quality.
Above all, we showed respect to the staff. Since we are within a strong union situ-
ation, it is almost impossible to reward staff with promotions and raises. Conse-
quently, it is essential that we reward them as best we can—respect, praise, pizza, and
pitching in all seem to work well for us.

What I found very heartening is that we were able to do this as we added func-
tions to the department. Streamlining and reduced budgets left us with free time, so
we took on binding, preservation, periodical check-in, and current awareness
services as we reduced staff. I can only attribute the success to a sense of team
spirit and increased electronic access.

PERSONNEL TRAINING

On the positive side, as we changed, ac-
quisions jobs became enriched, broad-
ened, and varied; by expanding the
parameters of what they did and by im-
proving the tools with which they worked,
the staff took on more responsibility and
authority. The staff were recognized for
their knowledge and ability, and, finally, the
borders between Technical Services and
Public Services softened. They are not com-
pletely dissolved and probably will not be as
long as one is assigned to one department or
the other, but they are definitely softened.
The job reassignments in both Public and
Technical Services acquainted staff with all
aspects of service and with the flow of ma-
terials through the library. Seeing what be-
comes of materials as they move through
the many processes in the library gives new
meaning to the slips and forms and rules of
entry in acquisitions and cataloging.

On the negative side, there was defi-
nitely a sense of confusion and loss of job
security as roles and responsibilities
changed rapidly. The workload increased
for management as we prepared for the
changes. The most difficult obstacle, how-
ever, was overcoming the implication that
things had not been done well before the
changes. In reality, things had been done
very well before the changes, given the
limitations of equipment.

What did we do to help the staff
through the changes and did it work? At
times, many times, it was very obvious that
none of us had gone beyond Management
101. Nevertheless, we structured training
for the staff, complete with work sheets,
rules, handouts, and practice sessions, and
the Central Office of Library Services for
the university backed us up with additional training sessions. Through it all, the management of the department was encouraged to take a proactive teaching role. Did it work? Yes, but it could have been better. If we were doing it over, we would have created additional ready-reference tools in an easily used package or looseleaf folder. We would definitely have looked into better training follow-up methods, and we would have tried to evaluate the training as we went—a perspective that is hard to achieve when you’re doing the training yourself.

As for advice to others about to embark on such changes, I suggest you know why you’re changing and believe in what you are doing. This gives you tremendous credibility and makes all transitions much easier. Be sure you keep everyone informed. Tell everyone why changes are being made and show how they will improve the library and the individual job. Plan your training, test it, and retest it in field situations before implementation, if possible. Don’t assume that everything you have written is brilliantly clear or even applicable. It is important to pitch in and be very visible. Develop some sense of rapport with every staff member and keep motivating even when the immediate job is done. And never rest on your laurels.

**Moving Toward the Future**

Where are we going from here? The City University of New York is strongly considering centralizing the acquisitions and cataloging technical services functions for our nineteen colleges, which changes not only the game but the ballpark as well. The centralization of these services will very likely be the next step, but regardless of which way we go, we’re going to come back to the basics we developed as we cut staff, added workstation capabilities, and managed training in the personnel area, and they are: Know why you are changing and believe in what you are doing. Try everything first yourself and ask your fellow wizards for advice. Train, evaluate, and retrain. Keep visible and keep motivating, even when you think the job is finished. Work with your staff, be part of your staff, and never rest on your laurels.
Change and Decay

Peter Kingsley

Some problems of managing acquisitions in a time of change are analyzed here. The concept of preparing for change is described as the most potent, often most difficult and least considered prophylaxis against decay of staff morale. The author considers some of the pros and cons of an integrated system from an acquisitions viewpoint as experienced in a major transition at New York University, then describes some of the variety of problems encountered and how they were resolved.

When I was a schoolboy at a small private prep school in St. Paul, Minnesota, we were indoctrinated, Christian, Jew, and Muslim alike, in our morning assembly with Protestant prayer and song. I believe this indoctrination has had two very positive effects on my life. One, I have grown up to reject all organized religion, and two, this background affords me a starting point for this article. You see, I believe these words to an old Protestant hymn are more than appropriate to the subject of this discussion—Managing Acquisitions in a Changing Environment:

Change and decay in all around I see,
Oh God who changeth not abide with me.

Please note how change is directly linked with decay, and stasis is linked with God and through him to peace and harmony. I, who have lived through two major changes in acquisitions departments, first at Columbia University and now NYU, know that change does not necessitate decay, nor is an unchanging God likely to abide with me for very long if I don’t change. As already confessed, I am not a religious man or even a professional librarian, but I can spot a special plea when I hear one. You won’t have to listen very hard to hear this plea on Roman Catholic tongues; on Muslim or Jewish ones; on tongues of blacks, whites, Asians; on male and female tongues; and on the tongues of little children. Something is there that does not like change—“Better the devil we know than the one we don’t know”—and if your Acquisitions Department is going through a major or even a minor revamping, as a manager or supervisor you might as well face it: change will not be automatically welcomed in all quarters by your staff.

One of the reasons that change was a positive experience for our staff was our choice for an integrated system (Advance GEAC) with which to replace the Research Libraries Information Network (RLIN) database as our main acquisitions module. Its positive aspects for the acquisitions staff are many:

1. It is an integrated system on which we can order, receive, and invoice materials and that links directly to our online catalog (Bobcat).
2. The new system was relatively easy to learn how to search, to order, and to

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receive, even though its command structure was totally different from RLIN's. Its database is composed solely of NYU and our consortium libraries' data, making the record of any given item far easier to locate.

3. The system allows a flexibility while remaining a precise tool with which to acquire materials by allowing order records to be transferred from other databases.

Although this new system added many positive features, let me quickly add that the joy I here express is not without alloy, and I will cover some of the problems encountered in due course. Nevertheless the new system has allowed measurable increases in the total number of orders placed, received, and processed while throwing up fewer hurdles for the staff to negotiate in all respects. The result has been a generally increased level of staff satisfaction with their own work while increasing the throughput of the department as a whole.

Perhaps as large or even larger a change for our staff and me to assimilate as the switchover took place was the simultaneous and complete revamping of our Serials and Book Acquisitions Departments into one single Acquisitions Department. This change involved the coordinated efforts of the department heads, of the architects involved, and of the office of the dean of the library to update, correct, and revise every aspect of the acquisitions flow. I believe that if any single one of those groups had not been able to involve itself intensely and in a coordinated manner, the change would have been a far rougher and a far more dangerous one.

First, our department head, Beth Jacoby, spent long weeks planning and revising the changeover from two parallel departments into one. Instead of separate ordering and receiving units for books and serials, we were combined into three overarching ones: ordering, receiving, and invoicing for all books and serials. I was shifted from books receiving supervisor to invoicing/payments supervisor for books and serials together. The workers who had worked in serials or books units previously were assigned similar work in their new units—becoming in effect specialists in, say, series receiving or monographs ordering. It was through Beth's painstaking care that this redissision of labor was successful and harmonious. Feedback and consultation with me and other staff members allowed us input into the decision-making process while it kept us informed of what was developing.

Second, the library administration took pains to support this redissision by giving orders to their architects to redesign the entire office space. They tore down walls, installed workstations, and upgraded furniture and wiring in order to provide all workers with their own terminals or computers. The close coordination of the architects with the changing needs of our new department was successfully overseen by the head of Technical Services, Arno Kastner, and head of Systems, Susan Kallenbach. Without their consultation, input, and oversight, the transition would not have been a successful one.

Last, the dean of the library, Carlton Rochell, approved the expenditure of considerable funds for the revamping and streamlining of the department, ensuring that we would have the ability to operate an up-to-date Acquisitions Department well suited to the demands of the present and future.

THROW OUT THE LIFELINE

While I think you can now see how careful planning and coordination of effort were required to overcome stasis and blunt the shock of change, the time has come to confess that not in every instance was stasis overcome nor was every shock buffered. One hymn that we did not sing in prep school, because it wasn't really a hymn but an old revival favorite, "Throw Out the Life Line," might have had peculiar resonance with NYU's implementation of all these changes:

Throw out the life line,
Someone is drifting away,
Throw out the life line,
Throw out the life line,
Someone is sinking today.
But I believe the negative aspects of our changes impacted our staff only temporarily because of all the reasons cited above. Still, that awful day came in August 1994 when the entire department was rooted up out of its old home and given temporary shelter while its new home was being built. It is important to note that only during this time of gross and daily uncertainty did we as administrators lose control of our changing environment and merely cope from day to day. Lurching from crisis to crisis, we attempted to aid and comfort those staff members who needed it.

Very little hand-holding, however, was required even in those dark days. I believe this was because the staff had already been carefully prepared for the changes to come; they could plainly see that a great deal of effort and expense was being directed at them and their department, and they were willing to give us the benefit of the doubt.

We were lucky. There were little or no construction delays. The new system worked once it was installed, and in fact all the pieces of this elaborate jigsaw puzzle came together without major problems. By the middle of September 1994, we were in our new home. All the physical stuff of a new environment—ergonomically designed workstations with independent lighting sources, adjustable keyboard holders, new office chairs, and a new database—were in place and on time!

There were wrinkles, of course. Those couple of days in December when all our new orders and receipts were inexplicably lost by the new system, for example. More seriously, a severe loss of data in the serials records forced us to create new order records, to add notes to indicate the loss of data, and to catalog reconstructed records by the hundreds or possibly the thousands. Also there have been breakdowns in the system that have resulted in several full days and weeks of downtime and loss of work. Since we did not receive a procedures manual, we administrators were asked to write a procedures book—which is a time-consuming and not-very-accurate method of making procedures standard throughout each unit.

Surprisingly, there has been a very low level of complaint from the staff during all of the bumpy parts, and morale has remained high. This, as previously observed, was the result of careful planning, the staff's perception of a work process made simpler and easier, and downright luck.

Therefore the most negative aspect of all these changes was the anticipation of them. The most positive aspect of the changeover was the administration's willingness and ability to work to predict what and when the changes would be and the overall improvement in the workplace environment.

The result? On the whole, I would say that the combined efforts of department heads, administrators, and staff succeeded in implementing major change without once ever having to "throw out the life line."
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Managing Technical Services in a Changing Environment: The Cornell Experience

Christian M. Boissonnas

Prior to 1993, the technical services sections at Cornell University were traditionally organized. At the request of the university librarian, a library self-study was conducted. Using a structure that included an overall steering committee and 6 functionally oriented task forces, an analysis of technical services was undertaken. In the end, the task forces recommended, and the university librarian accepted, that the traditional structure be replaced by a modular, less hierarchical structure in which staff groups were reorganized around discrete functions. The balance sheet on what was accomplished, naturally, is mixed. Most, but not all, of the changes that were made have had positive results.

TECHNICAL SERVICES AT CORNELL

One of the things that makes life interesting for academic librarians is that there are about as many ways of organizing technical services departments as there are libraries. We are all different and cling to our differences as a matter of pride—if not survival. At Cornell, of course, we organize technical services differently from the rest of you. Part of this is due to the truly bizarre nature of our university. We are, in fact, two institutions: one private, which most people seem to know about, and one quasi-public. The four statutory colleges at Cornell are funded by the State of New York and operate on the state fiscal year. Their staffs are paid on the state scale and receive state benefits. Their students pay state tuition but receive Cornell degrees. So, with the public/private mix, 4 fiscal years, 8 budgets, the institution is a marvel of complexity and contradictions. Let us now see how this translates into the library picture.

There are 19 libraries at Cornell, 16 on the endowed side, 3 on the state side. Predictably, the technical services picture matches the institution in complexity (see figure 1). Processing activities are concentrated primarily in Central Technical Services and the Catherwood, Law, Mann, and Medical libraries, but some processing takes place in three other libraries. Acquisitions work is done to varying degrees in 7 processing centers, with the heaviest concentration being performed in Central Technical Services.

Cornell has one online catalog for all of its libraries. The decision to have just one catalog was made many years ago and is the major reason we are forced to coordi-
nate activities and policies carefully among all of us. This coordination is managed by one of our two associate university librarians.

Now that I have set the context, let me turn to Central Technical Services, which is the department involved in the changes that concern us here.

**Central Technical Services in 1993**

As figure 2 shows, our organization was very traditional. Technical services were divided in three departments: Acquisitions, Serials, and Catalog. At various times in our history we have pulled catalog management out and set it up as its own department, but in 1993, it was part of the Catalog Department. The acquisitions functions were split between the Acquisitions and Serials departments. The Acquisitions Department dealt with firm and standing order monograph ordering and receiving, approval, gift and exchanges processing, and pre-order and precataloging searching. The Serials Department was responsible for ordering, claiming and cataloging serials and U.S. federal and state documents. Figure 3 shows the structure of the Acquisitions Department at that time.

The Acquisitions Department was made up of four sections: Orders, Searching, Receiving, and Gifts and Exchanges. At the top of the pyramid sat one assistant university librarian in charge of campuswide technical services. I was then the Acquisitions Librarian. When the assistant university librarian for Technical Services left, I was asked to take over responsibility for the three departments on an acting basis. At the same time I was asked to undertake a self-study of our organizational structure.

**The Self-Study**

It was the departure of our assistant university librarian—not budget cutbacks—that caused us to undertake the self-study.
It had been many years since we had taken a hard look at ourselves, and our university librarian felt that the time had come to do so.

We set up a structure to conduct the self-study, which consisted of a steering committee that included the 3 Central Technical Services department heads and other senior CTS staff (see figure 4), and six functional task forces that were charged to review particular functions and make recommendations (see figure 5).

Each task force was composed of the appropriate unit head for the function, the first line supervisors, and some line staff.

The chairs of the task forces, usually the unit heads, were also members of the steering committee. This complex structure was set up to meet two objectives that we knew to be critical in such an effort as we were undertaking: the need to involve as many people as possible, and the need to tap the expertise of staff familiar with the functions being reviewed.

Let us now turn specifically to the acquisitions functions. Figure 6 shows the composition of the two task forces set up to study these functions.

The task forces included staff from both the Serials and Acquisitions Departments. All of the members had extensive experience in the acquisition of all types of library materials. In the early stages of
the review we identified two goals as being paramount:
- To make Central Technical Services more flexible so as to better be able to deploy staff to meet changing user needs, and
- To improve communications across the units.

We believed that our very traditional and hierarchical structure impeded the flow of communications laterally. Further, the lack of shared goals and a common culture contributed to the isolation of each department. While an individual department might have been set up in a way to make it possible to move people around, the departmental barriers prevented such movement across departments.

The task forces met weekly and the steering committee met biweekly. The steering committee's main roles were to assist the task forces as they hit snags and to arrange coordination with other task forces when it was necessary. As things developed, we found out that some task forces were working very fast and others very slowly. Keeping the whole effort synchronized and moving forward became one of the major tasks of the steering committee. The Ordering and Receiving task forces had particularly difficult tasks after it became obvious that one goal should be to merge the acquisitions-related pieces of the Serials Department with the Acquisitions Department, and the cataloging-related pieces with the Catalog Department. There were major cultural issues to deal with, adjustments to workflows in all units, and the fear of the loss of identity and jobs of the Serials Department staff, who were witnessing their department disappear from under them.

**Actions**

In the end, the task forces recommended, and the University Librarian accepted, that the traditional structure be replaced by a modular, less hierarchical structure in which staff groups were reorganized around discrete functions (see figure 7).

The three departments were replaced by seven smaller administrative units with one, Catalog Management, functioning as a sort of catch-all unit for the functions that were either staffed with very few people or were funded from grants and would disappear in due course. One management layer, that of department head, was almost completely eliminated. One department head retired, one became the Research and Planning Librarian for the system, and the third became head of the new Central Technical Services.

Ordering of all materials, regardless of format, was merged into a new Ordering Section. Receiving of monographs and serials was merged into a new Receiving Section, but at first retained two workflow streams. Supervisors were instructed to begin cross-training their staff so as to eliminate the two work streams based on format differences as soon as possible. Searching was combined with a process we call "Fastcat," in which very little checking or editing of records is done. Staff in that unit can create bibliographic records, search (both pre-order and pre-cataloging,) or catalog. What they do at any given time depends on the type of work available at that time.

Did we meet our original goals? Absolutely. The new structure forces us to communicate more effectively. The department is too large for one person to manage without delegating a great deal of authority to unit heads. Those unit heads, who are very interdependent, cannot be successful without very frequent communication, something that did not happen in
the earlier configuration of the department. The new structure has also made us much more flexible. In fact, we are now so flexible that we keep changing in response to changing staff, leadership, and conditions. We have reorganized twice since implementing our new structure. The first reorganization took place in March 1995 (see figure 8).

The changes illustrated in figure 8 were made in response to our need to develop a position of Information Technology Librarian. We did this by redesigning the position of Catalog Management and Authorities Librarian. But we also had to find new managers to supervise the functions formerly under the Catalog Management Librarian. We reassigned physical processing to the Acquisitions Librarian, authorities to the Head of Original Cataloging, and catalog management to the Documents Librarian. Why this
particular lineup? In the case of physical processing, which includes barcoding, we are preparing ourselves to perform these tasks upon receipt of the materials rather than after they are cataloged. We are planning to use the barcode as a tool to control the inventory of in-process materials. Authority work is closely tied to original cataloging; hence the assignment of this function to the Head of Original Cataloging. Catalog management is a particular interest of our Documents Librarian, and she had the fewest number of staff to supervise, so assigning her the responsibility for that function was the logical thing to do.

The second time we reorganized (see figure 9) was upon the departure of the Information Technology Librarian. The changes illustrated were in response to two needs that we had identified earlier but not yet addressed. First, we transferred Gifts and Exchanges to Collection Development. We did this because the decisions that pertain to these functions mostly relate to selection and involve the collection development staff. Once the decision to select or retain a gift or a title received on exchange has been made, there is very little difference in the processing of that title from the processing of all other materials.

The second change that we made was to split the Original Cataloging Section in two. It was too large for the Principal Cataloger to manage, make cataloging policies, and participate in the overall management of the department as well. This meant having to ask the new Information Technology Librarian to take on some supervisory responsibility. There were no other managers available to take on the responsibility for more staff. Let me now turn specifically to how acquisitions processes have fared.

**ACQUISITIONS THEN AND NOW**

The main reason why I have gone through this reorganization in some detail is to demonstrate that the changes in acquisitions cannot be viewed separately from those made elsewhere in our department. Figure 10 summarizes the changes brought to the acquisitions functions by the implementation of the recommendations of our task forces. The most visible change, of course, is that we combined two acquisitions units into one by eliminating a structure based on format differences. We have also reduced the number of acquisitions librarians from two to one, streamlined the acquisitions units by removing functions that fit better elsewhere, and positioned the units for changes that we plan to make in how we physically process books. The verdict on what we accomplished, naturally, is mixed. Most, but not all, of the changes that we made have had positive results. In the rest of this paper I will summarize the positive
and negative aspects of our reorganization, address the question of what we did to help staff adjust to the changes, and discuss what I would say to others who are about to undergo similar changes.

**POSITIVE ASPECTS**

There were a number of positive aspects observed in our reorganization of processes. First, we achieved better coordination of processes throughout the department. The department’s goals are clear to everyone, and so are the adjustments needed on any day to meet the goals. In order of priority these goals are:

1. All orders are to be placed within 72 hours of receipt, 50% being made within 24 hours, and 75% in 48 hours.
2. All invoices, except approval invoices, are to be paid within one week of receipt.
3. All new materials must be under bibliographic control within one week of receipt.
4. All new cataloging with copy must be completed within one week of receipt in the cataloging units.

In order to meet these goals, the unit heads must talk, work together, and help each other. They are collectively responsible for the success of the department. The increased communications and elimination of departmental barriers have made us more efficient.

A second positive aspect occurred in the nature of the job tasks that individual staff members performed. Their job tasks became more varied, which they welcome. Third, the acquisitions librarian’s job has taken on more professional content.

**NEGATIVE ASPECTS**

A number of negative results occurred as well. First, the members of the former Serials Department lost their identity as a work group. Second, although we tried to allocate staff in proportion to the anticipated workloads, we failed to staff the Searching/Fastcat Section satisfactorily. This has resulted in missed deadlines, backlogs, and higher stress for these people. Third, we face the possibility of a real vacuum if the acquisitions librarian leaves, as there is no one to back him up. Fourth, in some staff members we observed uncertainty about how the process was going to work and a fear for their jobs. Finally, there was too much change, too quickly. At the same time that we reorganized administratively, we had to reorganize physically due to circumstances beyond our control. This added to the general confusion.

We took several steps to help staff adjust to the changes. We:

- involved them in planning from the beginning,
- tried to make sure that the supervisors were committed to the changes so that they could help their people, and
• tried to implement changes incrementally as much as we could.

Others who attempt to undergo similar reorganizational processes might consider the following points:

• Perhaps most important is to make sure that effective communications are taking place continuously while the planning is taking place. We thought we had taken care of that only to find out that the functional task forces initially did not all communicate well with operational staff. Once we understood that this was occurring, we tried to fix it—but it was too late and we never completely recovered lost ground.

• Involve staff from the beginning. Not all of them care, but enough do that their contributions are invaluable.

• Make sure that your goals are clear and that you can explain them. If you cannot, nobody will believe them.

• Do not try to do too much. We were definitely hurt by having to move people physically faster than we wanted to.

• Make sure that your colleagues in other units understand that business cannot be conducted normally while the reorganization is being implemented. Make sure that they understand what your staff will, and will not, be able to do.

• Do not look at acquisitions as a single or separate process. It is not and probably never has been.

• Leave yourself plenty of leeway for things to go wrong. They will.

• If you are the manager, spend 8 hours a day on the floor with your staff on the first two days of the reorganization, then 4 hours on the next two, and 2 hours on the fifth day. Nothing else that you have to do is as important, no matter what you or your boss may think. During that week you should have no other engagements, no other projects. While you are on the floor, work with people who have trouble adjusting. Don't tell them what to do, but help them discover for themselves the solutions to their problems.

CONCLUSION

The reorganization that we started in 1993 accomplished its goals. It made us better able to cope with all that we have to do, and it made our managers into a more effective team. It was not accomplished as smoothly as it should have been, primarily because, in spite of our best efforts, we did not sufficiently mind our communication channels and we tried to do too much. It is easy to see now that the major changes we implemented in 1993 were but the opening move in a process that will never end, the process of continuously adjusting to changing conditions.
Changing Acquisitions at Detroit Public Library

J. Randolph Call

Detroit Public Library is midstream in changing acquisitions work and workflow. Acquisitions functions and staff have been redistributed to combine ordering and cataloging into a unit renamed the Bibliographic Division; receiving functions have been merged with the Technical Processing Department; and payment functions have been merged with the Business Office. These dramatic changes are producing positive results. This process would have been smoother if more testing had been conducted.

Detroit Public Library (DPL) is midstream in changing acquisitions work and workflow as part of dramatic changes in relationships and organizational structure within Technical Services. In essence, the last ten years of collective thought and experience about making Technical Services more responsive and productive are being implemented at DPL now.

Acquisitions at DPL was a department-level unit within Technical Services. It was automated only in that ordering from our primary vendor, Baker and Taylor (B&T), was over standard voice-grade telephone lines using B&T-supplied software running on a stand-alone personal computer. All other functions were manual, including approval and notification plans, collection development tools for branch ordering, all non-B&T ordering, order tracking, receipt, payment, invoice tracking, and accounting of approximately 150 funds. There was no link between Acquisitions and DPL’s NOTIS database. Many acquisitions practices had not changed in ten to twenty years, and over that same time span, the unionized staff was also very stable. Backlogs existed at most steps in the acquisitions workflow, and there were frequent complaints from public services about those backlogs.

Two years ago, DPL’s Technical Services managers began planning to improve Technical Services’ efficiency and responsiveness. We began implementing changes in fiscal year 1995/1996. That implementation will continue through 1996/1997.

DPL now has no organizational unit called an Acquisitions Department. Acquisitions functions and staff have been redistributed to combine ordering and cataloging into a unit renamed Bibliographic Division; receiving functions have been merged with the Technical Processing Department; and payment functions have been merged with the business office. Bibliographic Division and Technical Processing both report to the same manager, the Bibliographic Services Coordinator.

In addition, DPL implemented the acquisitions modules of our NOTIS system, including all ordering, payment, and accounting functions.

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2. converted approval plans so that materials sent according to our profiles are purchased automatically, with only defective books and the rare title that should not have fit our profile specifications being returned to the vendor,
3. contracted with materials vendors to receive full, MARC format bibliographic records for automatic purchase items,
4. began to capture bibliographic records prior to order, with the expectation that this record would be used for cataloging once materials were received,
5. became tape-loading members of the OCLC Online Computer Center, Inc., and
6. began generating collection development lists using NOTIS bibliographic records downloaded into ProCite.

Dramatic and drastic impacts on acquisitions staff were seen:
1. Introducing automation made it possible for stiff members to learn new ways to do their jobs.
2. Staff members wound up reporting to different managers and working—sometimes very closely—with different Technical Services staff.
3. Most staff members also gained new responsibilities to learn.
4. From staff members’ point of view, the stability and support networks built up over years virtually disappeared.

Individual staff reacted very differently to these changes. Even though the changes we implemented are producing and will produce long-term benefits for both DPL and the acquisitions staff, change this drastic is a lot to learn to live with in the short term. It can be particularly frustrating where work environments have been static.

Despite those caveats, DPLs dramatic changes are producing positive results. They simplified and streamlined a number of acquisitions procedures, particularly in managing approval plans and in financial control and accountability. That, in turn, solved long-standing problems that the acquisitions staff had been aware of and frustrated by for years. For example, some backlogs disappeared, while the rest were significantly reduced, with the result that morale among the acquisitions staff improved.

Acquisitions staff members’ morale improved for other reasons, too. Implementing NOTIS acquisitions removed the “left-out” feelings that some acquisitions staff members had; this feeling was a result of the fact that acquisitions functions were nearly the last DPL operation to be automated. Also, integrating acquisitions, cataloging, and processing into one workflow and organizational structure allowed them to see better how they had always fit into the bigger picture. Overall, the integration of Technical Services into one workflow improved DPL’s relations with acquisitions vendors, too. We are questioning existing services and relationships much more and have changed some vendors and services.

However, one of the most significant changes—empowering the staff—was one that I thought would be almost universally welcomed; in practice, it turned out to have both positive and negative aspects. Some welcomed the increased personal responsibility and personal control. Some approached it cautiously and needed more supervisory and managerial support when anything they perceived as new occurred. One of their concerns was that empowerment would delegate decision making to paraprofessional level staff.

This concern about decision making made the changes in acquisitions workflow an issue for several DPL unions. This issue is now under discussion in a series of meetings between DPL senior management and union officials.

And, of course, there have been outright negative results. As mentioned earlier, the staff’s security of knowing whom they work with and how to deal with them—as well as their security in knowing how to do their jobs—disappeared almost overnight: almost all felt threatened to some extent. There was also concern that the better financial control DPL gained by implementing NOTIS would result in as much labor-intensive work in acquisitions as the manual procedures NOTIS replaced.
The most important negative was that our internal needs caused this drastic change to be implemented faster than would have been ideal. The new workflow and procedures were discussed and re-worked many, many times in planning. But we never made resources available to run a large-scale simulation of the entire new workflow. DPL’s implementation never benchmarked all facets of the new workflow at once.

When we tested, we always did specific functions with small samples of data. Using small samples masked problems that might have been solved before implementation. Staff confidence in the new workflow suffered because of those problems.

Of course, we anticipated there would be negative morale impacts and worked to help the acquisitions staff adjust. We gave more day-to-day personal attention and increased support from both immediate supervisors and middle managers. DPL involved them as much as organizationally possible in planning and started training for the NOTIS acquisitions modules as soon as we could schedule it. Most important, we created a much more open communications environment. Supervisors and middle managers listened to staff issues and complaints, and when we talked, it was to the staff, not at them.

If we could do this over again, there are some things I would do the same and some I would do differently. I cannot emphasize enough the importance of taking the time to plan carefully and thoroughly. You have to understand your existing workflow well enough to know why it is not producing all the results you want, as well as know how it can be changed to produce what you want. Even with the nearly two years of planning we invested in these changes, we should have built in time and resources to run the simulation using the full system and real data that I lamented earlier.

I also cannot emphasize enough the need to communicate with the staff members affected and involve them in planning as much as your organizational culture will allow. It is important to make sure you communicate the reasons for change and expected results so that staff members understand them whether they agree wholeheartedly or not. In our implementation, it was crucial to communicate to staff members and unions that DPL did not intend for existing members to lose jobs because changes were happening. Maintaining open communication channels will solve just as many problems as careful and thorough planning.

Finally, if I were doing this all over again, I would again insist on viewing Technical Services as a system, viewing it as an interconnected, interdependent set of functions—not as the traditionally discrete units on an organizational chart. In DPL’s case, much of the knowledge necessary to improve “acquisition” problems came from “cataloging” and “processing.” The “acquisition” changes in turn changed the workflows of both “cataloging” and “processing.”

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**Book Reviews**

Gregory H. Leazer, Editor


The easiest way to fill a lecture hall with librarians and archivists and maintain interest past lunch is to call a symposium on digital imaging technology and its impact on...well, on just about anything. The growing number of conference sessions, preconference workshops, and multiday intensives on digital image conversion, full-text encoding initiatives, and change, change, and more change attests to the nearly insatiable demand for basic information, creative thinking, and reassurance that what we know about managing information is not obsolete. The four volumes considered together here are a part of a booming literature expressly designed to demystify a complex technology.

The Research Libraries Group (RLG), which parented these publications, has one of the most consistent track records for organizing timely conferences. Just past its twentieth anniversary, RLG has evolved into an increasingly international membership corporation of 150 universities, archives, historical societies, museums, and other institutions. Founded on the faith that sharing catalog records could make resource sharing a practical reality, RLG built an effective mechanism for exchanging in-depth information on books and serials, preservation microfilm masters, and primary source collections. It established a system for direct book borrowing among members, and pioneered large-scale cooperative preservation microfilming projects. These programs thrived in part due to the growth of the Research Libraries Information Network (RLIN), a centralized bibliographic database that now encompasses some 75 million catalog records. RLG’s livelihood has depended almost as much, however, on its uncanny ability to document best practice, formulate guidelines, and train and enlighten practitioners on topics that matter.

Ostensibly documenting the proceedings of four discrete membership symposia, the four volumes reviewed here train a spotlight on the use of digital technologies by librarians and archivists. The reader benefits from their consistent format and presentation, production values that are uniformly high, and skilled editing of generally lucid writing by some of the strongest thinkers in research libraries today. Best appreciated when considered together, the volumes are as important for their gaps, partially formulated ideas, and inconsistencies as they are for the events they record. They may well be some of the
most useful resources for gauging our collective understanding at mid-decade of the future of core programs and services in research institutions.

Digital Imaging Technology for Preservation owes its genesis to a strategy session of RLG's preservation reformating interest group (PRESERV) in which members expressed concern about the preservation implications of proliferating digital imaging systems. Working on a short deadline, a steering committee assembled a winning list of presenters organized as a sequence of plenary addresses bracketed by five tutorials on the key aspects of digital technology. Opening and closing addresses provide political and administrative context for the use of digital technologies in libraries. Don Waters' closing remarks, especially, are an early formulation of the deep and lasting institutional infrastructure requirements worked out more completely in the recently completed report Preserving Digital Information. The general address articulates the argument that quality is and should remain the centerpiece of digital reformating. The address also presents the framework of issues that drives the tutorials.

The tutorials themselves, as reported in the volume, add real substance to the proceedings. They will be most useful to the advanced beginner, especially the three focusing on imaging system components and standards, quality control, and indexing. Don Williams' tutorial on the digital conversion process is a technically proficient overview of the complexities of achieving a digital scan that represents the characteristics of the original source document. Peter Graham's overview of the intellectual challenges of long-term access foreshadows his more extensive treatment published in College & Research Libraries some months later.

By focusing rather exclusively on the imaging process, symposium participants did not dig very deeply into the core issues of selection, use, and usability. Nevertheless, the symposium denotes a watershed in thinking about the preservation applications of digital technology. Only Janice Mohlenrich's 1993 compilation tackles the subject in depth prior to the RLG symposium. The proceedings are fraught with what might best be called "terminological flux." Concepts such as refreshing, reformating, and migration used interchangeably throughout the meeting today have taken on a more distinct meaning thanks to new research and thinking spawned in part by uncertainty uncovered at the symposium itself.

The shifting nature of the concepts of "image" and "access" appear again in the invitational symposium called to review RLG's Digital Image Access Project (DIAP). In the context of this project, image equates with photographic prints and negatives transformed to digital bitmaps, whereas access largely means varying ways to represent the content and relationships of visual images in the resulting databases. The goal of the DIAP was to explore the potential of digital imaging technologies for making photographs more widely available online and at the same time to push the potential of inter-institutional cooperation beyond its traditional emphasis on joint cataloging and microfilming projects. For DIAP, nine research each libraries selected 1,000 photographic images that in some way pertained to the common theme "the urban landscape." This theme left a lot of room for participants to make their own decisions about their contribution without additional effort to form the final product into an intellectually cohesive whole. A single vendor provided image conversion services, while each library was free to index the images as deemed appropriate.

The published proceedings are an honest representation of the outcome of the imaging experiment. Anne Kenney and Jim Reilly frame the symposium with summaries of the overall purpose of the pilot project and a technical review of the quality of the end product. In between, the focus of the symposium was largely on the advantages of varying approaches to image indexing. Jackie Dooley describes the ways in which each institution used the USMARC record in the RLIN database. Stephen Davis presents a fairly radical alternative, the SGML catalog record,
that taps the potential of the Standard Generalized Markup Language to record the interrelationships among images more completely than possible in traditional catalog records. Daniel Pitti pushes the description alternative even further by describing the experience of the UC Berkeley library in developing a standardized way of creating archival finding aids for collections containing digital images by using SGML.

The strength of the proceedings is the even-handed treatment of alternatives. In digital imaging projects, success from the perspective of those who use the resulting system is dependent on the issue of the quality and comprehensiveness of the image index, particularly so for photographic transformation. Recently completed research projects at Yale and Cornell universities are demonstrating conclusively that even simplistic value-added indexing accounts for one-third of the cost of the image conversion process. The proceedings of the RLG symposium explore the options but provide no “silver bullet” solutions. The reader is left with a fuller appreciation of the complexities but no guidance or evaluation methods for resolving the issues raised. This has partly to do with one of the weaknesses of all of the symposia considered in this review, namely, that the meetings are not structured in a way that fully engages the audience in seeking a consensus on what RLG members need to do to reach new levels of sophistication. Perhaps appropriately, the balance of the symposia is tilted toward education and consciousness-raising and away from coalescing a shared sense of purpose and outcome.

The editor of Scholarship in the New Information Environment rightly suggests in the preface that a more apt title of the conference proceedings might well be “support for scholarship…” This volume is all about the changing notion of collection development in libraries and archives, given the opportunities and complexities inherent in information technologies. The intellectual heart of the symposium is Ross Atkinson’s assertion that the only way to succeed in cooperative collection development in the online era lies in “the creation of a single, international, distributed, virtual library” (p. 30). The proceedings of Atkinson’s presentation only tease the reader. His full treatment of these ideas was published in Library Quarterly a year after the symposium.

The gauntlet thus laid down, RLG assembled an eminent group of thinkers at Harvard University to speculate on the shape and character of digital collections as they should be built to satisfy the needs of scholars. Czeslaw Grycz focuses on the nature of scholarly communication and the role librarians play in adding value to the process. Douglas Greenberg’s briefing concerns itself with trends in humanities scholarship in the context of changing technologies. He challenges librarians to establish programmatic priorities with the overall goal of wise collection development. “The most significant change imposed on us by the new technology and the new scholarship is, finally, not so much what technology to use and how to use it, but rather what to collect” (p. 41).

Perhaps the most challenging aspect of the symposium was Hal Varian’s treatise on the economics of information. What is striking about his model of differential pricing structures for information goods is not the model itself but its mere existence in a discussion among librarians and scholars. Varian applies lessons from successful traditional publishing industries to the world of electronic journals in a series of pointed examples. He concludes that producers (including libraries and archives) may need to establish pricing mechanisms that vary according to quality level and consumers’ willingness to pay.

It seems appropriate that RLG hosted three complex symposia and compiled the results before convening a meeting to consider the complexities of choosing which materials should enter the digital realm. Selecting Library and Archive Collections for Digital Reformatting set as its purpose the tall order of reviewing the changing landscape of selection decision making and providing basic selection strategies. Clifford Lynch provides the framework and philosophical foundation for the discussion. The focus is clearly on
"reformatting" in the sense of digital copying. Except for Lynch, none of the presenters considered the formidable challenges of selecting, acquiring, and integrating sources that exist in electronic form from their point of creation (e.g., electronic journals, image databases created elsewhere, numerical databases, and geographic information systems). Perhaps more importantly, the symposium did not delve into the connection between selection and the cost of building virtual libraries, in spite of strong presentations on funding options, relationships with publishers, and the management of service bureau costs.

The format of the symposium mixed formal presentations setting the context governing selection with case studies and a selection exercise completed by audience members and then analyzed by a panel representing diverse library and archive perspectives. The selection symposium was the only one of the four reviewed here to engage the audience actively in the formulation of ideas. While not particularly successful in this regard (the audience was far too large and diverse to accomplish the goal), the interpretation of the results demonstrated both the complexity of the selection process and the need for a radical departure from traditional models of single-institution collection development.

The gems in the proceedings are deeply buried and can only be appreciated with additional study of texts alluded to in passing or cited in footnotes. Consider, for example, Samuel Demas’ discussion of the role of collection developers in selection for digital reformatting. The heart of his quite strong argument on behalf of the core literature approach to selection is Ross Atkins’s unpublished typology of the qualities of the resulting digital product (p. 17). Similarly, Barclay Ogden’s solid review of preservation priorities is a mere outline barely reflecting the burgeoning literature on long-term access, such as the publications from the Commission on Preservation and Access. In Preservation in the Digital World, for example, this reviewer argues that digital imaging technology is more than another reformatting option. “The digital world transforms traditional preservation concepts from protecting the physical integrity of the object to specifying the creation and maintenance of the object whose intellectual integrity is its primary characteristic (p. 4).

Nancy Allen’s excellent closing remarks should be read first. She describes the infrastructure that provides for the long-term success of digital reformatting programs. Engagement of the issues outlined at the beginning of the symposium (technology, access, copyright, and preservation) largely flows from the commitments of institutions working alone and together to build in quality and integrity from the start. The struggle in the concluding wrap-up session to define the relationship between digital image conversion and long-term preservation reflects the lingering challenges of selection. Only on the last page of the proceedings (p. 135) is there an attempt to coalesce a set of priorities for selection from among many competing interests.

As recently as three or four years ago, librarians and archivists who wanted to learn about trends in digital imaging had to satisfy themselves with obscure technical reports, dry government analyses, and standards documents focused on business and industry applications. The volumes reviewed here are at times no less dry than these earlier reports. The cumulative strength of the proceedings is diluted somewhat by a lack of cross-fertilization among symposia—in spite of the fact that a large portion of the participants listed in the back of the volumes attended several or all of the meetings. Yet they form a record of technology assessment stemming from years of experimentation, pilot research, and concerted thought on the connection between emerging digital technologies and the organizations we are building. As such, the proceedings of RLG symposia are important tools in our self-education.

Beyond their important educational role, however, the symposia proceedings provide little assurance that the Research Libraries Group is positioning itself to produce the kind of implementation
guidelines that emerged from years of cooperative microfilming projects. In earlier models, RLG facilitated the meetings of seasoned practitioners, which then led to wider symposia designed in large measure to focus best practice. There is strong evidence in these publications that RLG can assemble talent, recruit participants, and document the result. This is an important start. Future symposia should transcend their all-important educational role and begin formulating a shared sense of purpose, priority, and procedure that typifies past collaborative efforts.—Paul Conway, Preservation Department, Yale University Library

WORKS CITED


According to the authors, this book began as a study of preservation management practices in the libraries of Britain in the early 1990s. The authors initially were following in the footsteps of F.W. Ratcliffe and D. Patterson (1984) who produced the influential Preservation Policies and Conservation in British Libraries: Report of the Cambridge University Library Conservation Project, known simply as the Ratcliffe Report. This report strongly criticized the state of preservation and conservation in British libraries and made recommendations for improvement. Great changes have taken place in British libraries since publication of the Ratcliffe Report. To determine how preservation management practices have changed, the authors conducted a survey. They sent 682 questionnaires to public, academic, and special libraries in Britain. Four hundred eighty-eight completed questionnaires were returned—a response rate of 71.55%. When analyzing these responses in the context of current developments in library and information service provision, the authors realized that preservation management was now considered in terms of access and use of books and information. This new perspective is reflected throughout the book.

Information in the book is based on the results of the survey, literature in the field, the authors' work experience (which unfortunately is only briefly described on the dust jacket) and the authors' conversations with their colleagues. The book consists of seven chapters, each of which is divided into several sections. Chapter one is impressively documented with 165 notes, but all the chapters have numerous references cited. The description on the book's dust jacket states that the book first puts the survey results into historical context and then "moves on to the findings about management attitudes and practices. Policy issues are considered, and some of the national and international prescriptive policy documents issued by professional organizations are compared with those from British libraries. The differences between the two form the basis of suggestions about how individual libraries might develop preservation policies and also what national policies could be considered."

One of the most interesting and informative chapters for me was the first, "A Decade of Development." Here the authors discuss developments that have taken place since publication of the Ratcliffe Report and assess the influence the report has had on bringing about these
changes. Topics include awareness raising, education and training, preservation policy, disaster management, security, surveying the collections, storage and environment, exhibitions and loans, audiovisual materials, substitution, digital technology, and conservation. The chapter is easy to read and provides a good overview of preservation-related developments in British libraries during the past decade. It is a valuable historic record and, by documenting developments of the past ten years, provides a point of reference from which to compare past and future events.

The authors state that chapters 2 and 3 are the factual foundation of the book, where they present their survey findings on managerial attitudes and management practices. In chapter 2, "Perceptions of Preservation," they "analyze the understanding and the experiences of preservation" (p. 48). In chapter 3, "Preservation in Practice," they look at the "existence and implementation of preservation policies in British libraries" (p. 74). Chapter 4, "Priorities in Preservation," "gives a broader professional, technological, and political context" in which the findings provided in chapters 2 and 3 can be understood (p. x). I found these three chapters difficult to read. A massive amount of information is introduced, and often the same information is presented repeatedly from different points of view when different issues and topics are discussed. This tends to be confusing, and keeping track of the detail and the different lines of thought becomes arduous.

In chapter 5, "Preservation Policy Guidelines," the authors undertake "to establish whether or not there is a commonly accepted understanding of what constitutes a preservation policy" (p. 97). To do this they look at guidelines that have been published by various organizations. The authors state that they are seeking norms against which to measure practice. Unfortunately, at least one of the guidelines they chose, albeit a prestigious one, is outdated and is in need of updating and improvement. In chapter 6, "Preservation Policies in Practice," the authors identify how preservation "policies work in practice, and how they can be developed" (p. 97). These two chapters provided more detail than my attention level could support, perhaps because the same information presented in chapters 2 and 3 is analyzed yet again, but from still another perspective. The discussion seems belabored and overcomplicated, and more thorough than is perhaps useful. In chapter 6 it may be best for those readers seeking only an overview to skip to the section "Some Observations" near the end of the chapter, in which the authors suggest broad outlines of how a library might address policy issues. Readers, however, who want a detailed analysis of preservation policy documents and issues in British libraries would find the entire chapter useful.

"Planning for Preservation," the seventh and final chapter, is interesting and is a valuable contribution to the body of literature on preservation planning. The authors suggest how preservation policies might be developed in institutions, and they indicate the national policies they think should be considered in the immediate future. They state that their suggestions are based on all the information presented in the book, particularly their analysis of practice.

In general, this is a worthwhile book of permanent research value, and it is a solid contribution to the literature on preservation planning. It contains information that does not exist elsewhere. It presents original research, and by citing extensively both primary and secondary sources in the field, it serves as a reference source. The book will appeal to different people in different ways. If one is doing research on a particular aspect of preservation policy or practice, or seeks an in-depth, detailed understanding of developments in preservation management attitudes and activities, the information contained in this book is invaluable. If, on the other hand, one is interested only in gaining a general understanding or an overview of preservation management in British libraries, this book is also useful. I suggest, however, that latter readers concentrate on chapters 1, 7, and perhaps the section of chapter 6 titled "Some Observations." These
parts of the book are informative, interesting, readable, and easy to follow. The rest of the book is more difficult to read. Parts of the text are dense and packed with detail and quotes. Also, the book is unavoidably repetitious: the authors tried to present as balanced and accurate a view as possible; to this end, the same information is repeated repeatedly in different contexts and from different points of view.

As in British libraries, great changes have taken place in United States libraries in the past decade. Many of these changes have been caused by the same or similar technological and economic developments that caused the changes in Great Britain. Like our British colleagues, we have been forced to look at preservation in new ways and to change our approach to preservation management. We now think in terms of preventive conservation, and we endeavor to make the most effective use of new technologies to preserve not just single items, but entire collections, and to make them available for future use. This correlates with what the authors of this book mean when they state that “access, retention, and preservation cannot be separated from each other,” (p.155) and that preservation management is now considered in terms of access and use of books and information.

The development and acceptance of new preservation management policies and practices appears to be farther along in the United States than in Great Britain. This is due in part to stronger advocacy in the United States. Several libraries have full-time preservation librarians with specialized preservation training whose sole responsibility is to ensure preservation of the collections in their charge and to advocate and initiate policies and practices that will serve this end. Many other libraries have staff who carry out this responsibility on a part-time basis in addition to their other job responsibilities. The library and preservation communities add support by being active and vocal in their promotion and debate of preservation issues. The authors of this book recognize the importance of advocacy in promoting preservation in British libraries. They explain that they offer their book “not simply as a report on a piece of research, but as a contribution to a debate . . . about how . . . Britain can exploit its written and printed heritage while preserving it for those who will come after us” (p. x). The authors know that by making librarians aware and knowledgeable of preservation management policies and practices, they enable them to advocate and initiate policies and practices of their own that will contribute to preservation of collections in their institutions.—Sherelyn Ogden, Preservation Consultant and Conservator, Library and Archival Materials, St. Paul, Minnesota

WORK CITED


The Roman poet and satirist Horace wrote: “Do you wish to instruct? Be brief; that the mind may catch thy precepts and the more easily retain them.” While reading this book, I was constantly struck by how succinctly, clearly, and methodically the author presents the concepts and methods involved in serials management.

The book touches on all aspects of serials management except cataloging, with the major emphasis on acquisitions. Throughout the book, the author strives to keep the reader aware of the need to understand the general workings of other sections of the library that are supported by the acquisitions function, especially collection development and public services. The first two chapters together lay the foundation for a practical understanding of serials work. In chapter 1, titled “Definition and Character of Serials,” Chen provides the reader with definitions and explanations of the various types of serials and their behavior. For example, the section on monographic series employs standard textbook definitions with
turns of phrase and concrete examples that clarify the concept. There is a clearly written section on electronic journals that makes a good attempt at establishing a definition but that also emphasizes their still-nebulous nature and development. Chen is less successful in the section in her description of "pseudoserials" because of a lack of examples, but this is the only flaw in an otherwise effective chapter.

Chapter 2 is titled "Organization of Serials Management." The methodical and unbiased presentation of the various organizational models (decentralized vs. centralized organization, organization by format vs. organization by function) is first-rate. Chen provides organization charts and a healthy discussion of the pros and cons of the models. She is careful to note that no two libraries are alike and that readers should thus consider the needs of their particular libraries in applying any one model or mixing and matching aspects of the different models. Even though this may seem obvious to many readers, the various organizational structures of technical services departments in general and serials departments in particular in different types of libraries is not broadly understood. Chen's effort to explain and present the structures and applications is among the best.

The next four chapters reflect the progression of materials through the selection process to receipt: Chapter 3 treats collection development, chapter 4 addresses serials vendors, chapter 5 explains acquisition methods such as direct ordering and blanket orders, and chapter 6 describes ordering, claiming, cancellations, and so forth. Along with a basic definition of collection development, chapter 3 presents an overview of current issues (ownership vs. access), a review of the information sources used in selection (trade bibliographies, reviews, and so forth), and budgeting. Chapter 4 provides basic information about the role of the vendor and under what circumstances a library might choose to employ one. There is information on how to choose and evaluate a vendor, a discussion of the pros and cons of using more than one vendor, and an important section on how to work with a vendor that emphasizes the need for the serials librarian to develop a business sense and be a considerate and reasonable customer.

Chapter 5 is a nuts-and-bolts section on acquisition methods. Chen describes standard acquisition techniques for electronic serials (for example, a subscription), and notes complications not associated with serials in traditional formats, such as lease agreements. Chapter 6 "explains the essential steps involved in processing serials acquisitions and serves as the basic guide for developing a library's serials acquisition working procedures" (p. 75). In this chapter, Chen is careful to point out that the basic guidelines can be followed by every library but that local environment will influence how serial acquisitions work.

The next two chapters address the last two steps of serials processing: Chapter 7 on preservation and bindery and chapter 8 on records control. Chen includes a discussion of using electronic technologies such as CD-ROM to preserve serials information, but most of the chapter is devoted to the time-honored bindery method because binding, as she says, "is the only preservation choice for those serials that are unavailable in microform or on electronic files" (p. 100). She describes what makes a good binder (prompt pickup and delivery) and what the standard techniques are (sewing and gluing). The chapter is thorough in describing the steps in preparing a bindery shipment, but there is no mention of the need to understand cataloging conventions to avoid binding changes of title together, and to ensure that supplements and special issues are bound correctly. Chen says in her introduction that cataloging will not be touched upon, but the failure to mention how cataloging and binding affect each other is an important omission in an otherwise useful chapter. Chapter 8 describes the most important and difficult aspect of serials work: records control. Chen states that "records control is the foundation for library functions" (p. 107). Again, her primary topic is acquisitions, and so she describes in detail the four types of records that are essential: order,
Chen emphasizes the need to establish a working relationship with catalogers. She also includes a statement with a summary of holdings records and the different levels of holdings reporting (summary vs. detailed).

Chapter nine describes the relationship between serials and public services. Chen emphasizes that “even if their work consists only of technical services, serials departments are heavily involved with services to the public” (p. 122). This is because of the changeable nature of serials and the complexity of the record-keeping. Chen goes on to describe the various reference services: using indexing and abstracting tools, interlibrary loan, article delivery services, and circulation policies. There also are sections on collection arrangement (should serials be in a separate location or interfiled with monographs?) and the question of whether to classify serials.

Chapter 10 is devoted to serials automation. Chen does not attempt to assess automated systems but instead tells the reader about their advantages. For example, she states that automation benefits collection development because the automated fiscal reports the system generates allow for collection analysis which in turn improves budget control. Another advantage is the combination of various paper files into one database (e.g., ordering, receipt, renewal, and bindery information could be in one record instead of four). Automated systems “not only maintain the order of files but also automatically review files to sort out actions that need to be taken” (p. 139). Chen also describes types of serial systems (stand-alone serials control only systems and integrated systems), system selection, records conversion, and implementation.

The final chapter is devoted to current topics and future challenges. Current topics include electronic publishing, serials pricing, copyright (again, electronic publishing emerges as a factor), and standards such as electronic data interchange (EDI). Chen addresses the challenge of keeping pace with change and how the role of the serials librarian has evolved, especially since the development of electronic publishing. She continues with a useful section on professional organizations, conferences, and the serials literature.

The book is structured in a solidly traditional manner. The introduction states the purpose and organization of the book. The chapters address serials management in a logical progression. Each chapter begins with definitions and a summary of the chapter's purpose and arrangement, allowing the reader to go directly to the topic of interest. The book concludes with an extensive bibliography and an appendix on serials management. The index is complete and accurate.

In the preface Chen defines her intended audience as “serials librarians, nonprofessional serials supervisors, and library school students who are interested in serials management” (p. xi). She goes on to state that “serials publishers, agents, and users can also use this book to gain an understanding of the library serials operation and promote cooperation among serials community members for mutual benefit.” She succeeds in constructing a book that serves as a primer for the novice, a planning and learning tool for the more experienced serialist, and a reference tool for anyone wishing to understand the organization and function of the library serials department.—Beverley Geer, Mad-dux Library, Trinity University, San Antonio, Texas
In Memoriam: Susan Garretson Swartzburg (1938–1996)

Evelyn Frangakis, Preservation Officer, National Agricultural Library

Susan Garretson Swartzburg, 58, preservation specialist and assistant librarian for collection management at Rutgers University Libraries, passed away October 13, 1996, from complications of pneumonia after returning from an international library association meeting in Beijing, China. A longtime member of the American Library Association, she was a pioneer in the field of library preservation. A tenured faculty member at Rutgers and an adjunct instructor and lecturer at Columbia University and Queens College in New York, Swartzburg was internationally renowned for her work in preservation. An exceptional mentor, she was much admired by her students for her depth of knowledge and devotion to the preservation of cultural property. Her untimely death is a severe loss to the preservation and conservation community.

Swartzburg held degrees from Wells College (B.A., English), New York University (M.A., English), and Simmons College (M.L.S.). Early in her profession, Swartzburg worked at Yale University (1966–72), where she planned and organized its library preservation program. Moving to Rutgers in 1972, she served as the first director of Alexander Library and later as acting art librarian for the university libraries. In 1982, she became the university’s preservation librarian and earned a reputation as a dynamic motivator and facilitator. In 1990 she was named assistant librarian for collection management as well as preservation specialist.

Over the course of her career, Swartzburg wrote countless articles, columns, and several books, earning a reputation as a gifted and prolific writer. Her three books are significant contributions to the body of preservation literature—Preserving Library Materials: A Manual (Scarecrow, 1980; 2d ed., 1995); editor of Conservation in the Library: A Handbook of Use and Care of Traditional and Nontraditional Materials (Greenwood, 1983); and Libraries and Archives: Design and Renovation from a Preservation Perspective (Scarecrow, 1991). At the time of her death, she was involved in a collaborative effort to revise George Cunha’s comprehensive preservation and conservation bibliography and was also working on a special preservation issue of Libr. She was editor of the New Jersey Library Association’s Preservation Section newsletter, preservation news editor for the Mid-Atlantic Archivist, an associate editor of Conservation Administration News until 1994, and a regular columnist for Art Documentation. She served on the board of trustees for Abbey Publications, the advisory board of the Northeast Document Conservation Center, as member of the New Jersey State Librarian’s Commission on Preservation and Access, on the advisory board of the New Jersey Newspaper Project, and the foundation for the Preservation of Sound Recordings.

Swartzburg was an active member of many organizations—among them ALA, the International Federation of Library Associations and Institutions, the Society of American Archivists, the American Institute for Conservation of Historic and Artistic Works, the Guild of Book Workers, the New Jersey Library Association, the
Mid-Atlantic Regional Archives Conference, and the National Trust for Historic Preservation. She founded the Princeton Preservation Group, an active regional preservation forum. She was also instrumental in the founding of the Book Arts Center at her alma mater, Wells College.

She is survived by her husband, Dr. Marshall Swartzburg; a son, Mark; and two brothers, Edwin and Frank Garretson. Those wishing to make a contribution in her memory may contact Ron Becker at the Rutgers University Libraries Special Collections Department, (908) 932-7006.
Erratum

Dilys E. Morris, Pamela Rebarcak, and Gordon Rowley

Text was omitted from the article titled “Monographs Acquisitions: Staffing Costs and the Impact of Automation” that appeared in the October 1996 issue of LRTS. Following is a reprint of the first part of the article, with the omitted text reinserted.

In this article, the authors examine the staff costs involved in monograph purchases by Iowa State University (ISU) Technical Services and explore the impact of automation on these costs between 1990 and 1995. They demonstrate that acquiring a monograph is now comparatively expensive relative to the costs of cataloging. They describe the impact of staff overhead costs on product or service costs and highlight the impact of professional responsibilities on costs. The authors further demonstrate that the automation of monographs acquisitions, in the main, has really only mechanized former manual processes and has done little to change the fundamental principles underlying the work or provide opportunities for innovation. Lastly, although cost data for collection development has not been documented, the authors explore the relationships between collection development and automated acquisitions, relationships that influence costs.

Throughout much of the twentieth century, the professional literature has presented surprisingly little relevant cost data about libraries. Leung (1987) noted that the scarcity of cost figures for cataloging was mirrored by inadequate cost data for all other library functions as well. These findings confirmed an earlier study by Dougherty and Leonard (1970) that covered the years 1876–1969. In recent years, however, there has been a growing awareness of the need for cost studies. Such studies have risen in importance because they serve as relative performance barometers for librarians and, more importantly, because they allow for comparisons over time (Leung 1987).

Iowa State University (ISU) Technical Services initiated a time and cost study in 1987 to investigate the impact of automation on services and products. Typically, interest in cost studies has been sparked by two additional factors: heightened institutional expectations for accountability and genuine fiscal restraints. Fluctuations in costs can reflect changes in many aspects of library operations, including organization, policies and practices, adjustments in workflow and the use of automation.

Bedford (1989) suggests three key reasons for conducting cost surveys: (1) to provide a management tool for controlling the costs of technical processing func-

Dilys E. Morris (dmorris@iastate.edu) is Assistant Director for the Technical Services Division at Iowa State University; Pamela Rebarcak (zager@iastate.edu) was Head of the Monographs Acquisitions Department during the study and has since become Principal Social Sciences Bibliographer; Gordon Rowley (gsrowley@iastate.edu) is Assistant Director for the Collections Division. Manuscript received May 12, 1996; accepted for publication July 9, 1996.
tions; (2) to manage technical processing functions with a progressive and dynamic approach; and (3) to compare cost information across academic research libraries in order to gain insights into factors that have direct effects on cost levels. Kantor (1989) also supports cost studies because of their usefulness for managers. In addition, he asserts that cost information can be used to justify the costs of library operations to those who pay the bills and to motivate both staff and managers into action.

The ISU Technical Services time and cost study substantiates the opinions of others writing on the benefits of cost analysis. The real costs of divisional services are known; therefore, comparisons of the relative costs of different services are possible. A time and cost analysis reveals how administration, meetings, professional service and scholarship, and other overhead staff costs add significantly to service costs. This information enables staff to see more clearly the costs of the services they deliver and to gain a better understanding of the cost implications of practices and policies. Additionally, it helps managers to make decisions on redesigning staff effort, and it allows both staff and management to better understand and accept the need for change.

**Organizational Structure for Monographs Acquisitions**

Acquisitions at ISU Technical Services is divided into three functional areas: serials acquisitions, monographs acquisitions, and payments. Payments staff handle both monographs and serials, and it is not possible to sort costs by monographs work only. Therefore this analysis excludes the costs of activities associated with payments for monographs. In addition, collection development responsibilities are in the Collections Division, and these costs also are not included.

ISU Library is an unusually centralized system with one branch library and three reading rooms. Because Technical Services functions have never been distributed there is a unique opportunity to look at total technical service activities. No monographs acquisitions functions are delegated to branch facilities. They do not maintain official on-order files or have any responsibilities for claiming or reconciliation of orders.

During the study, staff in the Monographs Acquisitions Department handled all acquisitions tasks, including all order, receipt, and vendor functions. The only exception was pre-order searching. Staff members in the department evaluated vendor services and discounts, negotiated changes, monitored the budget, referred fund allocation problems, and assured expenditure of the budget. The staff involved in monographs acquisitions included library assistants, some students, and a faculty department head. Since the study's completion, the department head position was eliminated, and monographs acquisitions is now a unit of a larger Acquisitions Department. Pre-order searching, then and since the study, is done by copy catalogers in the Monographs Copy Cataloging Department, and the costs are included in the study.

The ISU Library used the CARLYLE online catalog until it migrated to NOTIS in August 1990. Planning for NOTIS monographs acquisitions implementation began in the 1991–92 academic year. Firm orders and their payment were automated in July 1992, and one year later NOTIS monographs implementation was completed with the addition of approvals and standing orders.

In 1994–95, $1,415,000 was spent on monographs. Nearly 27,000 volumes and more than 2,000 nonbook pieces were purchased. Forty-one percent were received because of a firm order, 24% by approval, 21% by approval form orders, and 14% by standing orders. Nearly 3,000 monograph gifts were processed. During 1994 an approval vendor review was conducted, and in January 1995 the Library changed its major domestic approval vendor. Work is progressing to increase receipts by approval.

**Methodology**

**Time and Cost Sampling**

Five times each fiscal year Technical Services staff track all time worked for an
The sample weeks are spaced 10 weeks apart. Staff record their time within broad product and service centers, and each of these cost centers is divided into tasks.

**Product and Service Centers**

*Acquisitions*

*Cataloging*

*Volume Preparation*

*Catalog Maintenance*

*Conversion*

*Automation*

Software application development, OCLC/NOTIS/LAN support, telecommunications, hardware acquisition and customization

**Overhead Centers**

*Support Activities*

Administration, meeting attendance, nondivisional library and university work, professional service and research, secretarial support, general reading

*Paid Leave*

Each Product and Service Center includes all the time associated with that activity except meetings. Since many meetings are not limited to a center, all meeting time is collected under Support Activities.

Position numbers identify staff within the organizational structure and allow sorting of data in different ways. Staff normally complete their time sheets anonymously. The data are never used for individual performance evaluation.

The exact salary for each employee is collected for every sample week, and benefits are included. Hourly salaries are determined, and the task cost by employee calculated. Task times and costs are summed and form the basis for all analysis.

**Production Units and Cost Analysis**

In order to determine the costs of products and services, production units must be determined. For monographs acquisitions, total receipts are used. Receipts are basically a volume count. For nonbook material, pieces are counted, except for microfiche, in which case a title count is used to prevent inflation of production units. Production statistics are now submitted for the sample week period. Prior to 1994–95, production units were extrapolated from monthly statistics.

The number of items received is divided into staff costs to arrive at a cost per activity. In order to understand relative costs of the varying acquisitions activities, “receipts” is used as the constant pricing unit. This allows the following costs to be calculated and compared: cost per receipt to search orders, cost per receipt to place orders, cost per receipt to claim orders, cost per receipt to receive material, cost per receipt to maintain order records, cost per receipt to solve problems and monitor costs, and cost per receipt for training and documentation.

In addition, the overhead center costs must be apportioned to the acquisitions tasks. These overhead costs are paid leave time (sick, vacation, and holidays) and support activities (administration, meetings, personal, professional work, etc.). Overhead costs can be assigned at both the department or unit level and for the entire division with varying results. The costs are presented in three ways: (1) cost of acquisitions tasks only; no overhead, (2) cost of acquisitions tasks with departmental overhead, and (3) cost of acquisitions tasks with divisional overhead.

One more cost adjustment is made. Faculty and Professional and Scientific staff who work over 40 hours are not paid for these additional hours. Since the methodology calculates costs by multiplying a staff member’s hours worked by her hourly salary, the bottom line can include costs not paid. A formula is used to remove the unpaid “over 40” costs. In this analysis the two different costs are referred to as: Costs: Hours Paid; Costs: Hours Worked.

Costs are shown in the dollars paid during the sample weeks and also are adjusted for inflation to 1994–95 dollars.
To the Editor:

My article, "Grass Roots Cataloging and Classification," which was published in the July 1996 issue of LRTS, contained a blind reference on p. 275. The article by Taylor (1995) should have been listed in the references as follows:


I apologize for the oversight and hope that you will publish this letter as a correction.—David G. Dodd, Cataloger and Archivist, Kraemer Family Library, University of Colorado at Colorado Springs

To the Editor:

In the July 1996 issue of LRTS, Brendan J. Wyly writes about user behavior with large retrievals from online public access catalog (OPAC) searches.

Regarding our analysis of such behavior, he states (pp.213-14), "were such a searcher to scan only the first of several hundred screens, find [a] book, and then leave the online catalog with a promising reference title and call number, Wiberley, Daugherty and Danowski (1989, 1995) would classify the search process as a case of information overload because of the nonpersistence in scanning records." Mr. Wyly apparently believes that in our studies of user persistence, we considered users to be overloaded if they linked to a catalog record giving shelf location but did not scan all records retrieved.

Mr. Wyly has misunderstood our method. We assumed that anytime a user links to even a single record that gives shelf location, the user may have had a successful search. In these instances we made no inference about whether the user was overloaded, nor did we attempt to measure the persistence of such users. As we stated in "User Persistence in Scanning LCS Postings: A Report to the Council on Library Resources" (University of Illinois at Chicago Library, 1989, pp. 21-22), "We assume, as do other catalog studies, that users search a catalog to find a call number of a known item or a call number to serve as a starting point for shelf searching for books about a subject. Because call numbers are found in detailed LCS records, this assumption means that, with LCS, a user who is not overloaded will find and display at least one detailed record if his or her search retrieves the known item sought or an item that the user thinks is about the subject sought." (For those unfamiliar with LCS, retrieving a detailed record is similar to the process of linking that Mr. Wyly focuses upon.) Similarly, in "User Persistence in Displaying Online Catalog Postings: LUIS," LRTS 39: 256, we state: "The user could display one or more bibliographic records, but not display all records. Such a user could be called a record displayer.

"The persistence of record displayers could not be assessed because the bibliographic record(s) the user displayed might have been just what was sought, obviating the need for further persistence. Consequently, the behavior of record displayers will not enter into the discussion of persistence."—Stephen E. Wiberley, Jr., Robert Allen Daugherty, University Library, University of Illinois at Chicago
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