

# Library Resources & Technical Services

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**NACO Normalization**  
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**ARL Library Catalog Department Web Sites**  
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**Cataloging and Digitizing Ephemera**  
*Ann Copeland, Susan Hamburger, John Hamilton,  
and Kenneth J. Robinson*

**The Condition of Our "Hidden" Rare Book Collections**  
*Jennifer Hain Teper and Sarah M. Ereksun*



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# Library Resources & Technical Services

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Cover photo by Angela Hanshaw details antique files.

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# Editorial

Peggy Johnson



The Association for Libraries Collections & Technical Services (ALCTS) will celebrate its fiftieth anniversary in 2007. Originally the Resources and Technical Services Division, the name was changed to ALCTS in 1989. The official journal of the association has remained *Library Resources & Technical Services* since volume 1, number 1, winter 1957. Two journals, *Serial Slants* and the *Journal of Cataloging and Classification*, were discontinued in 1956, forming the

basis of the new publication. Esther Percy, the first editor, described the journal as “open to papers and discussion of all topics pertinent to the interests of the Division and its sections, both those general and inclusive in scope and those of specific questions or considerations.”<sup>1</sup> Percy went on to identify hopes for the new organization—which also held true for the journal—“that serials people, catalogers, order librarians, book selectors, and others will not only have a forum for exchange with those of like interests, but also an opportunity to work closely with those of related interests . . . Great days are ahead, and *Library Resources & Technical Services* anticipates being a part of them!”<sup>2</sup>

The first two volumes of *LRTS* address topics eerily familiar fifty years later. Papers with such titles as “Keeping Serials Costs in Check,” “Toward a Better Cataloging Code,” “Arabic Cataloging: A Criticism of the Present Rules,” and “Evaluation of the University Library Collection” could appear in *LRTS* today.

Previous editors of *LRTS* have been essential to its success. The high regard that *LRTS* has held for fifty years is due in large part to the editors. Only those who have edited a peer-reviewed journal can understand the time and attention required to produce an issue of sound and meaningful papers every three months. Now seems an appropriate time to recognize those previous editors.

Esther J. Peirce, 1957–1967 (v. 1–11)

Paul S. Dunkin, 1968–1971 (v. 12–v. 15, no. 3)

Robert Wedgeworth, 1971–1973 (v. 15, no. 4–v.17, no. 1)

Wesley Simonton, 1973–1979 (v. 17, no. 2–v.23, no. 3)

Elizabeth L. Tate, 1979–1987 (v. 23, no. 4–v. 32, no. 2)

Shelia S. Intner, 1987–1990 (v. 32, no. 3–v.34, no. 3)

Richard P. Smiraglia, 1990–1996 (v.34, no. 4–v. 40, no. 4)

Jennifer Younger, 1997–2000 (v. 41–v. 44)

John Budd, 2001–2003 (v. 45–v. 47, no. 2)

Esther Percy has my utmost admiration for editing *LRTS* for eleven years—longer than any other editor.

Journals do not survive without editorial boards, production staff, and, of course, a steady stream of contributing authors. Space does not permit naming all of these important people, but I value all with whom I have worked and I know my predecessor editors did as well.

## References

1. Esther J. Percy, “Introducing LRTS,” *Library Resources & Technical Services* 1, no. 1 (Winter 1957): 4.
2. Ibid.

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## Letters to the Editor

January 8, 2006

In November I received the October 2005 (49, no. 4) issue of *LRTS*, and after reading your glowing remarks about the editorial board and how this is a carefully refereed journal, I launched into the article by Ed Jones about the Functional Requirements for Bibliographic Records (FRBR) titled “The FRBR Model As Applied to Continuing Resources” (p. 227–42). I was disappointed to find so many errors and information presented in a misleading fashion that could have so well been addressed through editorial review working with the author. Mr. Jones has an excellent message about our being at a great time of opportunity, and he points to the inconsistencies and varying practices that have evolved over the years for continuing resources through our cataloging rules, rule interpretation, and practices and the MARC format. Using FRBR for such analysis is precisely what that conceptual model is for. I just wish the statements had been clearer about what is really Mr. Jones’ opinion and what FRBR states. There are also the distracting errors of fact that I am disappointed the reviewers did not catch.

Let me just state the problems that perhaps can be corrected for future readers. The very first sentence refers to the 1997 IFLA conference declaring it was in New Delhi—it was in Copenhagen, Denmark.

In the second paragraph he calls the FRBR model an “entity-analysis model”—it is an “entity-relationship” model or “E-R” model. The relationships are a key component of this type of model, and E-R models were one of the leading models for computer system design when the IFLA Study Group began its work on FRBR. Later object-oriented models appeared (which Mr. Jones mentions at the end of his article), but entity-relationship models are still being used.

At the end of the second paragraph, he gives his own parenthetical definitions for the FRBR “Group 1” entities for bibliographic resources, saying that FRBR posits the four levels of abstraction. A casual reader might assume these are from FRBR, when in fact they are his own spin. He should have told the reader so. For example, he attributes *manifestations* as being “the totality of *items* that together constitute a single publication.” The *manifestation* in FRBR is the “physical embodiment of an *expression* of a *work*.” A *manifestation* is not limited to “publications” nor sets of *items*. Mr. Jones’ perspective is very interesting, but not that of the model itself.

In the third paragraph, he states “FRBR does not explicitly distinguish *expressions* from *works*, noting that the conceptual boundary between these entities is culturally determined.” What I gather he intended was that the model allows a lot of flexibility in the boundaries between *works* and *expressions*, but the definitions and entities themselves are certainly explicitly distinguished in FRBR. According to FRBR, a *work* is “an intellectual or artistic creation,” and the model purposefully allows flexibility for applications to determine boundaries between *works* and between *works* and *expressions*, depending on the needs of the application. If it is applied to archival collections, their culture has a slightly different view of what is considered a *work* than what libraries consider *works*. FRBR explains, “The concept of what constitutes a *work* and where the line of demarcation lies between one *work* and another may in fact be viewed differently from one culture to another.” An *expression* in FRBR is the realization of the *work* through some notation (alpha-numeric, musical, choreographic, etc.), sound, image, object, movement, etc., or any combination of such forms,” which also includes performances. I like to think of a *work* as the ideas, and an *expres-*

sion as the way we express those ideas. As FRBR explains, “On a practical level, the degree to which bibliographic distinctions are made between variant *expressions* of a *work* will depend to some extent on the nature of the *work* itself, and on the anticipated needs of users”—but certainly FRBR distinguishes between *work* and *expression*. Some applications may choose to meld the two, what Patrick LeBoeuf has called a *workexpression*, so there is a single abstract entity, but again this will depend on the needs of the application and the nature of the entities themselves.

Mr. Jones then sets the stage that continuing resources “may not fit well into the FRBR model, both because of the multiplicity of relationships in which such resources may be involved and because these relationships may obtain at multiple levels within the Group 1 hierarchy.” This makes no sense to me, as the model doesn’t care how complex or simple the relationships are, it merely indicates there are relationships and those can be among any of the entities. To me, continuing resources fit very well into the model. Perhaps Mr. Jones intended to say future systems built on the FRBR model might find it difficult to include the existing bibliographic records for continuing resources, due to our past practices. He certainly gets to this at the end of his article.

He states “Continuing resources have been conspicuously absent from these early experiments, primarily because they have proved to be problematic” (p. 228). On that same page he also declares there was a “reluctance to include bibliographic records for CR in early FRBR-ization experiments.” VTLS was one of the very first integrated library systems to provide a FRBR-ization of their system, and serials and other continuing resources are very much present and are nicely handled. VTLS has demonstrated that using FRBR enables the collocation of the various related serials to help the user find what they need in ways that our cataloging rule divisions of serials into new “works” at every title change does not. I think the problem Mr. Jones is describing has more to do with the way we have cataloged these materials in the past and the MARC format limitations. FRBR allows us to step away from the baggage of cataloging rules and MARC format to see what’s going on and hopefully design better systems in the future.

Mr. Jones seems to imply that CR were intentionally omitted from FRBR. In fact, serials were specifically included—the term “continuing resources” didn’t appear until after FRBR, but that mode of issuance is certainly well-represented. This unfortunate misconception also has shown up in other recent articles, such as Kristin Anteman’s “Identifying the Serial Work As a Bibliographic Entity” in the October 2004 issue of *LRTS* (49, no. 4), when, in fact, serials have been in the FRBR model from the start. There are numerous references to serials and examples for serials in FRBR as follows.

When describing the *entities*, continuing resources are used in the examples for *work*: the *work* titled “Wall Street Journal” with two *expressions* for the Eastern edition and the Western edition (p. 22), which Mr. Jones himself uses to demonstrate further interesting complexities that need to be addressed for other editions; also FRBR has the example of the map series, “The Ordnance Survey’s 1:50 000 Landranger series” to show aggregates and components and *works* within *works* (p. 29).

In the FRBR sections describing attributes, the attributes for *work*, *expression*, *manifestation*, and *item* all have applicability for continuing resources. The particular mode of issuance isn’t a factor to be specifically separated out. At the *work* level, FRBR includes uniform titles, etc. (p. 32–35); under attributes of *expression*, the added specific attributes that are unique to serials are indicated, such as the attribute of “extensibility of expression” and “sequencing patterns (serial),” “expected regularity of issue (serial),” and “expected frequency of issue (serial)” (p. 35–40); for attributes of *manifestations* (p. 40–48), that FRBR provides the special addition of attributes unique to serials, such as “publication status (serial)” and “numbering (serial)”; the *item* attributes (p. 48–50) also are general and can apply to continuing resources; and the specific attributes unique to serials appear in the tables of attributes mapped to user tasks (p. 88–96).

For relationships, continuing resources are certainly included in FRBR, such as in the *work-to-work* relationships table (p. 65) and the *work* relationship examples of “The British journal of social and clinical psychology” and the “Annual report of the Librarian of Congress” (both on p. 67); also in the whole/part *work-to-work* relationships discussing dependent parts and independent parts or *works* (issues of serials and intellectual parts of multipart works, monographs in series, journal articles, etc.) (p. 69); and under *expression-to-expression* relationships (translations, etc., p. 71; and supplements, p. 72) and whole/part *expression-to-expression* relationships (p. 74) for volumes/issues of serial and journal articles; *expression-to-work* relationships for supplements (p. 75); and *manifestation-to-manifestation* relationships for reproductions and alternate formats/simultaneously released editions (p. 76)—all of which apply to serials and other continuing resources; and whole/part *manifestation-to-manifestation* relationships for a volume of a multivolume *manifestation* (p. 77); and *manifestation-to-item* relationships for reproductions (p. 79); and *item-to-item* relationships (p. 79) and whole/part *item-to-item* relationships (physical components of a copy) (p. 80).

The user tasks in FRBR apply to continuing resources as much as to any other mode of issuance.

Even in the FRBR listing of basic level national bibliographic record, the special attributes for serials are included, such as numbering (serials), frequency statement (serials),

and, of course, all of the series data elements (p. 112–16).

The IFLA Study Group creating FRBR contacted people working with all types of materials to be sure to include them all in the model, and the worldwide serials community was involved.

Another inaccuracy that should have been caught by the reviewers: p. 238, “FRBR defines two relationships at the *manifestation* level: reproductions and alternates; all other relationships are defined only at the *expression* or *work* levels.” Not so. FRBR also defines whole/part *manifestation-to-manifestation* relationships (p. 77).

Mr. Jones refers to a “FRBR record structure” (p. 236), but there is no such thing in the conceptual model. That would be up to a system application of the model, which could be done in whatever ways made sense to the particular application, types of materials included, audience for the tool, etc.

In his historical narrative of the changing views of what constitutes a serial *work* mistakenly assuming that the *Paris Principle* “work” is the same as the FRBR “work,” Mr. Jones points to both the draft “Statement of International Cataloguing Principles” and the *Paris Principles* as sources for defining serial *works*, but neither document does that. In the *Paris Principles* and in AACR2, “work” was used very imprecisely to variously refer to a bibliographic record, the bibliographic resource represented by the bibliographic record, or actually the FRBR “work”—that is, the contained intellectual content. How the identifying data elements (attributes) for a *work* are packaged or displayed (e.g., through data elements in a bibliographic record, through a controlled citation in an authority record, etc.) is a system design issue, not a FRBR requirement.

The *Paris Principle* 11.5 codified successive entry, and it prescribed how one entered serials entered under title in a catalog. *Paris Principle* 11 is titled “Works Entered under Title,” but here the word “works” means bibliographic resources. More precisely *Paris Principle* 11.5 prescribes that separate “main entries” (i.e., bibliographic records) should be made for each different title when a serial publication is issued successively under different titles. There is no mention of the concept that FRBR calls *works*.

On p. 234, Mr. Jones states, “point 11.5 of the *Paris Principles* implies that a new catalog record is created *only* when the title changes.” This is a misunderstanding on the part of Mr. Jones. *Paris Principle* 11 is exclusively for “Works entered under title” and has nothing to do with works (i.e., bibliographic resources) entered under personal authorship (which is found under *Paris Principle* 8) or corporate authorship (found under *Paris Principle* 9). It was not that the “successive entry” in the *Paris Principle* 11.5 produced a different definition of *work* for serials than for other resources, as Mr. Jones states, but that in the *Anglo-American Cataloguing Rules*, the rules for creating serials

bibliographic records were so different from rules for other materials. FRBR helps us to see those differences and question why we should perpetuate such distinctions.

The term “main entry” and the imprecise use of the term “work” intentionally are avoided in the draft Statement of International Cataloguing Principles. Instead the statement builds on the FRBR model and basic principles of collocation, bringing together related resources to help users find, identify, select, and obtain information they need.

There are also some unfortunate statements that Mr. Jones makes, such as “The *work* shares content with its *expressions* and *manifestations*, it does not necessarily share a title proper”—they don’t “share” a title proper at all! In this section of his article, Mr. Jones’s statements about serial works reflect the unfortunate past practice, particularly with serials, of calling “titles” *works*. In FRBR the *work* is the content as expressed in the *expression* and recorded in some physical carrier or container that is the *manifestation*, as exemplified by an *item*. So an *item* contains the *manifestation*, *expression*, and *work* all at once. The “title proper” has been used by serials cataloging to identify a serial to provide clues about creating new bibliographic records; when enough of a change has occurred, our practices have required us to make a new bibliographic record. But this should not be confused with the FRBR concepts, because from the FRBR perspective, all that is going on is that the titles proper on *manifestations* are changing. We have been calling this a new title, or inaccurately from the FRBR perspective, a new serial *work*, when we are just identifying changing attributes of the *manifestation* in the FRBR sense. Title proper is a cataloging term for a title we find on the *manifestation*. In FRBR it is an attribute of the *manifestation* and not of a *work*—the entities don’t upwardly “share” attributes. Attributes of *works*, *expressions*, *manifestations*, and *items* have a transitive relationship among the entities; in other words, they are inherited from *work* to *expression* to *manifestation* to *item*—not upward from a *manifestation* (title proper) to *work* (uniform title).

Mr. Jones also makes assumptions about the FRBR-based system that are very limiting and reflect a narrow view of what such future systems might offer. On page 239 he states, “As with translations, placing the successor relationship at the *expression* and *work* level similarly breaks the *manifestation-to-manifestation* connection.” That would only happen if the system regrettably made no transitive relationships for the *work-expression-manifestation-item*. Transitive relationships are inherent to FRBR and should be part of any future system built on the FRBR model.

Repeatedly throughout this article, Mr. Jones conflates the current cataloging rule interpretations, MARC format limitations, and CONSER practice with a conceptual model that can be applied in many ways. The value of a conceptual model is to use it for another perspective on the universe of

things being controlled by cataloging to see what is really going on with them and how they might be best presented to users without the baggage of cataloging rules, communication formats, or rule interpretations and special practices that have evolved over time for practical purposes.

His analysis points out how sloppy we have been in the past in describing resources, and how that sloppiness prevents us from meeting basic objectives for catalogs and fulfilling basic user tasks as pointed out in FRBR. Hopefully by using FRBR as an analysis tool, we can see how to improve our descriptions and systems for the future.

On page 238, we get to what is perhaps the basic theme of this article “catalogs that incorporate the FRBR model will need answers to these questions, and revisions to AACR2 and MARC 21 to accommodate the FRBR model will need to provide those answers.” I wish he had stated that right up front.

In his conclusions, Mr. Jones first recommends looking at abandoning the title-based definition of “work” for serials. He immediately throws this out by saying the large number of legacy records built on that premise present a formidable barrier, but is this really a problem for systems? If it is true, as he claims, that legacy data is based on a title-based definition of *work* for serials, it provides us with a mapping for a FRBR-based system design. We may find we don’t need to convert the legacy records but instead re-use them in creative ways in the future.

His second conclusion is about frequently revised *works* having different rules and two “competing” citation practices that present a challenge to the model. The model still works just fine with such different practices, so perhaps Mr. Jones meant any FRBR-based system would need to recognize these differences and accommodate them. Serials can have personal authorship and be entered under personal name according to our rules, but our rule interpretations and guidelines limit the practice. These particular different practices for main entry have no impact on retrieval in a future system that can rearrange data elements for displays (if the data elements are clearly tagged and labeled). The fact that there are different identifiers for the same entity also is not a problem, as there is no claim that an ISSN or an ISBN is a unique identifier, and no need for them to be unique—they would just be displayed along with other identifiers as an attribute of the *manifestation*.

For his third conclusion about using a single bibliographic record for multiple *manifestations*, this is not an “intermediate level” for FRBR, but instead reflects current practice of combining multiple *manifestations* on the same bibliographic record. The entities in the bibliographic record are still the FRBR *manifestations*. FRBR entities

do not equate to MARC records—there is nothing in the FRBR conceptual model that requires a separate record for each entity; in fact, it is well-recognized that the attributes of all the FRBR Group 1 entities now appear in the MARC bibliographic record. There would be some advantages to fulfilling user needs if we were to more clearly distinguish among the attributes for distinctive entities, such as enabling better collocation of displays. At the LC Bicentennial Conference in 2000, Matthew Beacom pointed out the benefits of *manifestation*-level records in MARC bibliographic records for communicating and later manipulation of the records, and how much more difficult it is when one combines many *manifestations* into a single MARC record for systems to them pull out the individual *manifestations* for display purposes.

In his fourth conclusion, Mr. Jones observes that relationships within the current MARC structure are imprecise. We need to step back to think what relationships are important to this type of material and how might those be displayed usefully to users. It’s too easy in serials cataloging to forget that for the vast majority of serials, users are trying to find an article, not the *work*, *expression*, *manifestation* of the entire serial. We overly complicate our lives and the work of users by focusing on the serial level rather than the article level. One can view the serial level as the citation—needed for authority control for a consistent citation and to show how things are related so users can find what they need even if their citation is slightly wrong (as interlibrary loan staff deal with constantly). Our serial cataloging records are mostly for acquisitions, check-in, and other catalogers—library uses—to organize and manage these packages of information, this particular mode of issuance used to convey articles—*works* in their own right. Why not take a really radical view—a user’s view—to see how we might better describe serials and other continuing resources in the future for the various user needs: the acquisitions need for placing and tracking orders (subscriptions, standing orders, etc.) with order records; the check-in need to provide inventory control for received and missing and claimed issues on check-in records; the cataloger’s need to distinguish among serials with similar titles—perhaps in authority records; the researcher’s need to obtain a specific article (the part within the whole—the component *work* within the aggregate *work*) with direct links to the article. Let future systems combine with abstracting and indexing services even more than we do today and with publisher’s data and with digital resources to get the various users to what they need, hopefully at a faster and less expensive way than we do now.—Barbara B. Tillett ([btill@loc.gov](mailto:btill@loc.gov)), Chief, Cataloging Policy and Support Office, Library of Congress

February 13, 2006

When Peggy Johnson notified me that *LRTS* had received a letter from Barbara Tillett relating to my paper, my first reaction was excitement that the paper had attracted the attention of so distinguished a colleague. However, after learning of the length of the letter and that I would have a chance to respond, I suspected my reaction might be premature. The reader will probably have reached the same conclusion.

Dr. Tillett has been deeply involved with FRBR from its beginnings, and is as knowledgeable about the model as they come. Consequently, she was able to subject my article to a level of scrutiny previously enjoyed only by my doctoral dissertation. I cannot address all of her points here because to do so would produce a reply at least twice as long as her letter, and that would be a cruel and unusual punishment of the reader, producing more heat than light.

Nevertheless, I would like to defend, however reluctantly, the *LRTS* referees, a breed at whose hands I have often suffered. I believe the referees in my case identified most of the major problems with my draft. Evidence of their work survives as artifacts in the revisions I made, some of which inadvertently produced some of the very errors that Dr. Tillett identified. For example, to take only the first two items she mentions: in the first case—the 1997 IFLA conference in New Delhi—my original mention of the approval of the terms of reference for the FRBR study at the 1992 IFLA conference in New Delhi got conflated during the revision process with the presentation of the report at the 1997 conference in Copenhagen; in the second case—the “entity-analysis model”—my original mention of the “entity-analysis technique” got conflated with the related “entity-relationship model.” *Mea culpa*.

My intent in writing my paper, and in the presentation on which it was based, was to look at the FRBR model from the point of view of the cataloger, in terms of its practical application. Given this, I readily admit that the Group 1 entities are more accurately described “top down,” by moving from the more abstract *work* to the more concrete *item*, as becomes especially clear in an object-oriented model. But I was taking the cataloger’s perspective, working up from the *item* with which he or she would be presented, and I don’t believe that taking this perspective seriously compromised the reader’s understanding of the model. My cataloger point of view also necessarily involved referring to the various tools and resources available to the cataloger today, if only to show the areas where these tools and resources will need to be modified to produce records that conform to the model.

Moving on, I acknowledge that FRBR contains several CR examples, as Dr. Tillett points out at length. I never dis-

puted this. My point was that the CR examples in FRBR are all *straightforward*, and so they are frustrating to the serials cataloger, who has only heard of such creatures in legend. My paper may have been guilty of going too far the other way, but I felt this was necessary to tease out the areas where problems might arise in applying the FRBR model to CR.

I stand by my assertion that continuing resources were conspicuously absent from early “FRBR-ization” experiments, and I do so because they *were* conspicuously absent. This had nothing to do with the FRBR model *per se* but rather with the fact that these experiments had to deal with existing MARC records, not with records reflecting the model, and unpleasant things happened when you tried to “FRBR-ize” them. In particular, problems arose because of the inconsistent representation of relationships in these records. This reluctance to include CR in these experiments has since changed. VTLIS has now attempted to handle successive entries by invoking the concept of the *superwork*, something not currently part of the FRBR model (and I’m not sure how it would fit in cleanly). But working with existing MARC records, *superworks* will need to be manually defined, on a case-by-case basis, distinguishing serials that continue one another (and should be represented by a *superwork*) from those that supersede one another (and should not).

In my conclusions, I deliberately did *not* make recommendations, though I suggested various possibilities. The only place where I really have trouble with the FRBR model—and with all existing cataloging codes—and have been unable to come up with a solution is in the parallel structures available for representing revised editions (my second conclusion). Like many libraries today, mine receives catalog records from a variety of sources, and records for revised editions often differ on this very point, resulting in an intermingling in the catalog of discrete records for individual editions and consolidated records for a range (or scattering) of editions, often the *same* editions. I suffer this cacophony because to resolve it on an ongoing basis would be too labor-intensive; but I think in the end such dual structures in the catalog are a disservice to the user.

Hopefully, this reply will help clarify that I am in fact a friend of the FRBR model, and that the concerns I have expressed in this and other articles have been those of a friend, interested primarily in making the model work and in seeing it fulfill as much as possible its great potential.—*Ed Jones (ejones@nu.edu), Bibliographic and Metadata Services Coordinator, National University Library San Diego, Calif.*

# Exploring the Potential of a Virtual Undergraduate Library Collection Based on the Hierarchical Interface to LC Classification

Adam Chandler and Jim LeBlanc

*The Hierarchical Interface to Library of Congress Classification (HILCC) is a system developed by the Columbia University Library to leverage call number data from the MARC holdings records in Columbia's online catalog to create a structured, hierarchical menuing system that provides subject access to the library's electronic resources. In this paper, the authors describe a research initiative at the Cornell University Library to discover if the Columbia HILCC scheme can be used as developed or in modified form to create a virtual undergraduate print collection outside the context of the traditional online catalog. Their results indicate that, with certain adjustments, an HILCC model can indeed, be used to represent the holdings of a large research library's undergraduate collection of approximately 150,000 titles, but that such a model is not infinitely scalable and may require a new approach to browsing such a large information space.*

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In 1997, a working group of staff from Columbia University Library's Bibliographic Control Department and Library Systems Office set out to build a hierarchical interface to Library of Congress classification (HILCC).<sup>1</sup> The project's aim was "to assess the potential of using the Library of Congress classification numbers as provided in standard catalog records to generate a structured, hierarchical menuing system for subject access to resources in the Libraries' electronic collection."<sup>2</sup> The group sought to leverage Columbia's MARC catalog data to permit "Web-based access to the Libraries' electronic resources outside the context of the OPAC."<sup>3</sup> With help from reference staff and selectors, they created a classification mapping table to link discrete ranges in the Library of Congress classification schedules to entries in a three-, and occasionally four-, tiered subject tree. Simultaneously, the group developed a Web interface that would give users access to data extracted weekly from catalog records via this multilevel subject hierarchy. In the end, Columbia produced a HILCC model that provided access to some 5,000 electronic resources by way of 541 distinct subject categories.<sup>4</sup>

In his 2002 article, "HILCC: A Hierarchical Interface to Library of Congress Classification," Davis reflected on the challenges of testing HILCC's effectiveness and overall value. He also questioned the project's scalability—

“what may seem useful and manageable against a list of 5,000 electronic titles may look quite different when the list has grown to 50,000 or more.”<sup>5</sup> Davis invited other institutions to pick up where Columbia left off, to take Columbia’s mapping tables and rework them for their own collections and within their own institutional contexts. In 2004, the Cornell University Library accepted Columbia’s invitation and began to explore the theoretical possibility of using HILCC to create a virtual undergraduate collection of Cornell’s print material. This essay presents the results and conclusions of that investigation.

### Applicability of the Columbia Model to Cornell’s Undergraduate Collection

Like most large research libraries, the Cornell Library is facing a serious space problem, especially on the central campus, where academic real estate is at an all-time premium. The most common means of dealing with this space crunch is to transfer lesser-used material to offsite storage facilities, as well as to merge and reorganize those collections that remain onsite. As the Association of Research Libraries (ARL) noted in 1999, “Most ARL libraries already house a significant amount of material in offsite storage facilities, and the pace of both new construction and renovation of existing structures has accelerated during the past decade.”<sup>6</sup> This trend continues unabated, and there is no indication that it will lessen in coming decades. On May 18, 2005, for example, the University of Texas at Austin Libraries announced that they are “relocating the Undergraduate Library (UGL) to other discipline-specific campus libraries in their system as the first step in the process of transforming the Flawn Academic Center (FAC) into an integrated, learning commons.”<sup>7</sup>

Thus, ARL institutions can benefit from studying ways to create print collections without regard for physical contiguity of the collections’ individual elements, collections that transcend the limits of storage locations—that are virtual collections of physical items.

The question the authors sought to answer was “Can Cornell use Columbia HILCC mapping to represent Cornell’s current undergraduate print collection of approximately 150,000 titles—that is, would the Columbia mapping be transferable from one research library’s e-resource collection to another research library’s print collection and, perhaps more importantly, would it scale?”

The HILCC mapping tables identify alpha-numeric call number ranges in the LC classification schedules that correspond to subject categories in the system’s user interface. Each unique subject string is assigned a numeric label in the table (here called a “subject code”). Although classification ranges are mapped to one and only one unique subject string, these hierarchical subject categories are often the product of more than one LC classification range.

Table 1 presents an excerpt from Columbia’s HILCC charts that deals with LC’s “A” schedule and Columbia’s “General” subject categories. Each row is numbered and indicates a unique range in the LC classification. The range itself is recorded in the “Class . . .” columns. The HILCC subject string is recorded in the “Category. . .” columns. The last column contains the subject code, which links single or multiple rows to a single HILCC subject string, as applicable. For example, rows 342 and 343 in the excerpted table represent the LC classification ranges AC0 through AC799 and AC900 through AC1100, both mapped to the Columbia HILCC subject string “General—Collections & Series (General)” and numerically labeled with the subject code 1270.

In order to apply the Columbia mapping scheme to the titles in Cornell’s undergraduate library, the authors extracted all the call numbers from the undergraduate collection, using a program written by Peter Hoyt from the Cornell University Library Systems Office. They wrote a Perl script to match each call number to a range in the Columbia HILCC tables to derive the corresponding HILCC subject string and increment the count.<sup>8</sup> The authors then output the results as a delimited file for analysis.

The results of running the Cornell undergraduate library’s call numbers against the Columbia HILCC scheme

**Table 1.** Excerpt from Columbia University Library’s HILCC mapping table

Row ID	Class 1A	Class 1N	Class 2A	Class 2N	Category 1	Category 2	Subject code
342	AC	0.0000	AC	799.9990	General	Collections & Series (General)	1270
233	AC	800.0000	AC	899.9990	General	Dissertation Indexes	1004
343	AC	900.0000	AC	1100.9990	General	Collections & Series (General)	1270
344	AE	0.0000	AE	90.9990	General	Encyclopedias (General)	1271
345	AG	0.0000	AG	600.9990	General	Dictionaries (General)	1272

Notes: Taken from “Columbia University Digital Library Projects: Hierarchical Interface to LC Classification, Arranged by Class Number Range 03/05/04,” [www.columbia.edu/cu/libraries/inside/projects/metadata/hilcc/newfiles/class.html](http://www.columbia.edu/cu/libraries/inside/projects/metadata/hilcc/newfiles/class.html) (accessed Sept. 2, 2005). No third-, fourth-, and fifth-level subject categories appear in this table excerpt.

were not promising. In many cases, the number of titles assigned to individual subject strings represented what might be construed as a reasonably manageable retrieval set; however, in other cases, the number of titles assigned to individual subject strings was quite high.

Table 2 illustrates the incremental breakdown of titles per subject string for both Cornell and Columbia. The first column in the table lists hit rate ranges, from no titles retrieved for a given subject string to a maximum range of 10,001 to 15,000 titles retrieved. The second column records the number of subject strings that fell into these retrieval spans for the Cornell undergraduate collection. The third column gives this number as a percentage of the total number of HILCC categories. The fourth and fifth columns provide the results for Columbia's HILCC scheme. Although the number of titles in several of the retrieval sets were similar to those extracted by Columbia for their e-resource collection, Cornell's use of Columbia's HILCC scheme resulted in several subject categories that comprised more than 1,000 titles, 10 subject categories that yielded more than 2,500 titles, and 2 subject categories that, if searched in a live database, would return more than 10,000 title hits. At the same time, some 42 percent of all Columbia HILCC subject categories yielded 10 or fewer titles, with 121 categories retrieving no results at all. This histogram suggests that using the Columbia HILCC scheme, as is, would not lead to optimal results if applied to Cornell's undergraduate print collection—at least not with that collection's current content. Imagining an effective interface, given current technology, that would accommodate retrieval sets of this size using a structured hierarchical menu system is difficult.

The authors did speculate, however, that Cornell might be able to modify Columbia's HILCC scheme to better fit

the test case. Before starting to edit the mapping tables, though, they investigated the potential applicability of a revised HILCC scheme for other libraries' undergraduate collections. They solicited data from four other ARL libraries (the Columbia University Library, the University of Illinois at Urbana-Champaign Library, the Indiana University Libraries, and the University of Washington Libraries), ran their call numbers through the Perl scripts described above, and derived a Pearson correlation of the results. The correlation shows the relative similarities in number of titles per subject category among these library collections, using a count of the number of titles that map to a given HILCC subject category for each of the sample libraries and comparing the numbers. The tendency was similarity between institutions; that is, a given category that had a high number of titles at one institution was likely to have a high number of titles at other institutions. Based on the results of this analysis, the authors went forward with the revision of Columbia's HILCC scheme, confident that the retailored tables would be generally useful to other libraries who wish to build further on Columbia's or Cornell's work.

### The Cornell Model

In order to create a more usable HILCC scheme for Cornell's test collection, the authors needed to make some assumptions. First of all, how many titles encompassed by a single HILCC subject string are too many? Second, at what point does the hypothetical user interface contain too many subjects—too many branches and hierarchical levels on the subject tree—if modifying a HILCC scheme requires splitting the strings into further categories and subcategories? The authors decided on two mutually sup-

**Table 2.** Number of titles per HILCC subject: Cornell and Columbia

<b>Titles per subject</b>	<b>Cornell scheme distribution</b>	<b>%</b>	<b>Columbia scheme distribution</b>	<b>%</b>
0	121	22	166	31
1–10	108	20	118	22
11–50	102	19	111	21
51–100	56	10	39	7
101–250	57	11	52	10
251–500	35	6	20	4
501–1,000	27	5	22	4
1,001–2,500	25	5	10	2
2,501–5,000	7	1	2	<1
5,001–10,000	1	<1	1	<1
10,001–15,000	2	<1	0	0
<b>Total titles</b>	150,200		64,830	
<b>Mean titles/subject</b>	210		120	
<b>Median titles/subject</b>	16		8	
<b>Standard deviation</b>	844		171	
<b>No HILCC hit</b>	7993		570	

portive and presumably manageable parameters to address these concerns: editing Columbia's HILCC tables in such a way that no subject string would apply to more than 1,000 or fewer than 10 titles in Cornell's undergraduate library. Reducing the higher hit rates would necessarily result in the creation of more subject categories. However, combining categories that originally returned very few or no title hits would decrease the number of subject categories and, hopefully, counterbalance the effects of this expansion. As Columbia had done, the Cornell researchers opted to use the LC classification schedules for guidance on how to split or merge categories logically. When new subject category names were required, they would, for efficiency's sake, assign whatever seemed most appropriate without consultation with colleagues from other departments (though actual implementation of a revised HILCC scheme to build a live user interface would call for broader input along the lines of Columbia's implementation model). Finally, the authors decided to examine the physical material *in situ*, rather than through automated methods, since they had only a general notion about how best to approach the reorganization of the tables and no clear idea about how easy or difficult it would be to slice and dice extremely narrow classification ranges containing hundreds of titles.

The work of restructuring the Columbia HILCC tables for use with Cornell's undergraduate collection took roughly 65 real-time hours and resulted in a revamped scheme of 500 subject strings (8 percent fewer than Columbia

HILCC) in a five-level subject tree (one level deeper than Columbia HILCC). No subject string encompassed more than 1,000 titles, and only 4 strings retrieved fewer than 10 titles. The four subject strings that retrieved fewer than 10 titles were left as is because there seemed to be either no reasonable way to combine them with other categories or a clear expectation that the hit rate would increase gradually over time. For example, the string History & Archaeology—Regions & Countries—United States—Local History—Territories, Protectorates, Etc., though yielding only 2 titles, cannot be logically associated with any of the other fifth-level regional categories associated with U.S. local history. The string Languages & Literatures—English—English Literature—Individual Authors—2001-, retrieving only 7 titles, is an example of a subject category that is expected to grow. The two Columbia subject categories that required the greatest adjustment were those for Languages & Literature—English—American Literature, and Languages & Literatures—English—English Literature, yielding 13,906 and 13,173 title hits respectively, using the unedited Columbia categories. The authors broke these subject strings down into 32 and 33 new categories respectively, in a five-level structure. Table 3 shows 9 of the 33 categories into which the authors split the original subject string, Languages & Literatures—English—American Literature, in order to bring the retrieval set to within the 10 to 1,000 hit range for each remapped subject string. Thus, hypothetical users of Cornell's revised HILCC scheme for

**Table 3.** Cornell HILCC Subject Categories for American Literature, with Cornell undergraduate title count (excerpt)

Subject code	Class 1a	Class 1n	Class 2a	Class 2n	Category 1	Category 2	Category 3	Category 4	Category 5	Count
1203.1	PS	1.0000	PS	144.9990	Languages & Literatures	English	American Literature	History & Criticism	General	462
1203.2	PS	147.0000	PS	195.9990	Languages & Literatures	English	American Literature	History & Criticism	Special Classes of Authors & Subjects	234
1203.3	PS	201.0000	PS	228.9990	Languages & Literatures	English	American Literature	History & Criticism	19th-20th Centuries (General)	142
1203.4	PS	241.0000	PS	286.9990	Languages & Literatures	English	American Literature	History & Criticism	Special Regions & States	69
1203.5	PS	301.0000	PS	379.9990	Languages & Literatures	English	American Literature	History & Criticism	Poetry, Drama & Prose (General)	517
1203.28	PS	3550.0000	PS	3553.9990	Languages & Literatures	English	American Literature	Individual Authors	1961-2000, A-C	763
1203.29	PS	3554.0000	PS	3559.9990	Languages & Literatures	English	American Literature	Individual Authors	1961-2000, D-I	767
1203.30	PS	3560.0000	PS	3564.9990	Languages & Literatures	English	American Literature	Individual Authors	1961-2000, J-N	779
1203.33	PS	3600.0000	PS	3626.9990	Languages & Literatures	English	American Literature	Individual Authors	2001-	45

American literature would be able to more precisely specify the subject categories they wished to browse and retrieve a more manageable number of titles with each search, though they would need to drill down an additional two levels in the subject tree to do so.

Tables 4 and 5 illustrate a segment of Columbia HILCC in which more than one subject string covered fewer than 10 titles, an area revised according to the 10 to 1,000 hit range parameters of the project. This reorganization of the “General” category resulted in a 25 percent reduction in the number of categories for that subject area.

Through this two-pronged strategy, the Cornell researchers were able to restructure the Columbia HILCC scheme, developed to provide the underpinning for a Web-based hierarchical menuing system for subject access to that library’s collection of electronic resources, into a revised scheme to provide (theoretically) the basis for a similar menuing scheme for subject access to Cornell’s undergraduate collection—all with a moderate amount of human intellectual effort. They also demonstrated (again, in theory) that

such a framework is scalable up to approximately 150,000 titles.

This menuing scheme is unlikely to be infinitely scalable, however. Mapping the entire Cornell University Library against the revised HILCC categories, using the same 10 to 1,000 title hit range, would require more than 12,000 categories, with significantly more hierarchical tiers, to represent the complete Cornell collection of some 4.4 million titles (the number of Cornell’s total holdings in late summer 2004). The authors derived this projection by examining the results of their first attempt to map Columbia HILCC, as is, against Cornell’s undergraduate holdings, then calculating the average number of additional subject categories required to bring the retrieval sets of 1,000 titles or more into the desired target range of 10 to 1,000 hits per subject string (see table 6). Then they extracted the call numbers for all 4.4 million titles held by Cornell, mapped them to the revised HILCC scheme, and used the conversion factor derived from the calculation above (2.87) to estimate how many additional subject strings would be

**Table 4.** Columbia HILCC subject categories for general works, with Cornell undergraduate title count

Subject code	Class 1a	Class 1n	Class 2a	Class 2n	Category 1	Category 2	Category 3	Count
1270	AC	0.0000	AC	799.9990	General	Collections & Series (General)		202
“	AC	900.0000	AC	1100.9990	General	Collections & Series (General)		*****
1004	AC	800.0000	AC	899.9990	General	Dissertation Indexes		0
1271	AE	0.0000	AE	90.9990	General	Encyclopedias (General)		14
1272	AG	0.0000	AG	600.9990	General	Dictionaries (General)		25
1273	AI	0.0000	AI	122.9990	General	Indexes (General)		13
1274	AM	0.0000	AM	500.9990	General	Museum Publications		11
1275	AN	0.0000	AN	9999.9990	General	Newspapers (General & Popular)		2
1276	AP	0.0000	AP	272.9990	General	Periodicals (General & Popular)		94
1277	AS	0.0000	AS	945.9990	General	Academies & Learned Societies Publications		14
1278	AY	0.0000	AY	2001.9990	General	Almanacs, Directories & Yearbooks (General)		7
1279	AZ	0.0000	AZ	999.9990	General	History of Scholarship & Learning		54
1294	Z	1001.0000	Z	1199.9990	General	Bibliography	Bibliography (General)	53
1295	Z	1200.0000	Z	4999.9990	General	Bibliography	Bibliography (National)	46
1296	Z	5000.0000	Z	7999.9990	General	Bibliography	Bibliography (Subject)	45
1297	Z	8000.0000	Z	8999.9990	General	Bibliography	Bibliography (Personal)	22

Note: No fourth- and fifth-level subject categories appear in this table excerpt.

necessary to retrieve 1,000 titles or fewer for each and every string in the scheme (assuming that when mapping the entire Cornell collection, no fewer than 10 hits would be represented in any subject category—an assumption that proved to be correct). An excerpt from the chart representing some of the large, medium, and small retrieval sets revealed in this exercise appears in table 7.

Thus, although modifying the Columbia HILCC scheme to create a menuing system for a typical ARL undergraduate collection should be possible, HILCC's scalability is limited.

Databases of approximately 150,000 titles may be approaching the limits of a HILCC scheme's effectiveness.

### Next Steps: Browsing and Visualization

As previously noted, the decision to limit retrieval sets in the Cornell remapping of Columbia HILCC to 1,000 titles or fewer was somewhat arbitrary. The presentation of that many search results using a conventional library catalog

**Table 5.** Cornell HILCC subject categories for General Works, with Cornell undergraduate title count (excerpt)

Subject code	Class 1a	Class 1n	Class 2a	Class 2n	Category 1	Category 2	Category 3	Count
1270	AC	0.0000	AC	799.9990	General	Collections & Series (General)		202
“	AC	900.0000	AC	1100.9990	General	Collections & Series (General)		*****
1298.1	AC	800.0000	AC	899.9990	General	Directories, Indexes, Information Resources (General)		27
“	AI	0.0000	AI	122.9990	General	Directories, Indexes, Information Resources (General)		*****
“	AY	0.0000	AY	2001.9990	General	Directories, Indexes, Information Resources (General)		*****
“	ZA	3038.0000	ZA	5199.9990	General	Directories, Indexes, Information Resources (General)		*****
1271	AE	0.0000	AE	90.9990	General	Encyclopedias (General)		14
1272	AG	0.0000	AG	600.9990	General	Dictionaries (General)		25
1274	AM	0.0000	AM	500.9990	General	Museum Publications		11
1275.1	AN	0.0000	AN	9999.9990	General	Newspapers & Periodicals (General & Popular)		95
“	AP	0.0000	AP	272.9990	General	Newspapers & Periodicals (General & Popular)		*****
1277	AS	0.0000	AS	945.9990	General	Academies & Learned Societies Publications		14
1279	AZ	0.0000	AZ	999.9990	General	History of Scholarship & Learning		54
1294	Z	1001.0000	Z	1199.9990	General	Bibliography	Bibliography (General)	53
1295	Z	1200.0000	Z	4999.9990	General	Bibliography	Bibliography (National)	46
1296	Z	5000.0000	Z	7999.9990	General	Bibliography	Bibliography (Subject)	45
1297	Z	8000.0000	Z	8999.9990	General	Bibliography	Bibliography (Personal)	22

Note: No fourth- and fifth-level subject categories appear in this table excerpt.

interface (or a Google-type interface, for that matter) would be decidedly unwieldy. Even limiting the results to no more than 500 titles or to as few as 200 titles would present obstacles to quick and easy browsability. Before pursuing further work with HILCC schemes, researchers should consider questions of browsability and visualization of search results. How many search results are too many? In a comprehensive investigation of University of California's (UC) MELVYL systemwide library catalog use over 479 days in 1998 and 1999, Cooper found that users of the system, which at the time included the catalogs of nine campuses plus other institutions and some additional citation databases, on average displayed 4 to 5 citations per session, or 2 to 3.5 citations per 100, depending on the database searched.<sup>9</sup> Cooper highlights the fact that the amount of time users allocated to displaying results was steady across databases, between 30 to 40 seconds per session, and speculates that "one explanation is that irrespective of the database, there are certain motor limits in place when an individual scans citations on a screen that keep the time relatively constant."<sup>10</sup> Jansen, Spink, and Saracevic discovered from Excite search engine data in 2002 that 58 percent of users look at only the first page of 10 results, 19 percent look at the second page, and 9 percent will go to the third page.<sup>11</sup> Only a small percentage continue browsing beyond that. They concluded, "any search result beyond the tenth position in the list would be meaningless for 58% of Web users."<sup>12</sup> What, then, is the threshold of usefulness for conventional displays of large retrieval sets, or, perhaps more precisely, what is the threshold of their usability? Are the standard modes of presentation of hierarchical menus the best choice for HILCC and similar subject schemes that aim to deliver user-friendly access to large library collections?

The proper response to this last question should be a definitive "no." Although online access to catalog data has sped up and improved users' ability to find and use information about library collections, computer interfaces have, in some ways, reduced the capacity to browse these collections by limiting one's sense of the overall contents of a library. Scrolling through screen after screen of surrogate data is not always a good substitute for moving freely through library stacks, where one's eyes may catch a broad peripheral glimpse of dozens of items at a time, while honing in on particular pieces for one reason or another. While one could argue that browsing a collection through the mediation of a computer monitor, keyboard, and mouse merely calls for a different approach to browsing—a reorientation of browsing techniques—technology should permit a scope that is at least as broad as the traditional library browsing space.

In a 2004 contribution to *D-Lib Magazine*, Dushay introduced a prototype for just such an online mechanism.<sup>13</sup> Developed for use with the National Science Digital Library (NSDL), the NSDL Virtual Book Spine Viewer addresses the "focus + context problem"; that is, it optimizes the utility of the browsing software by allowing the user to focus on details, without sacrificing the "larger context of the information space."<sup>14</sup> Figure 4 (Virtual Spine Viewer) in Dushay's paper shows how such a browser would work. The frame at the left of the screen contains a subject-based, hierarchical menu that is smaller, but still similar to that of HILCC. The middle frame represents the subject category space in which the "book spines" are arrayed so that they can be seen at a glance. Within what is technically known as a "scatter plot ZUI" (or Zooming User Interface), the titles are scattered along horizontal and vertical axes, over which the user can position a kind of virtual magnifying glass to select poten-

**Table 6.** Derivation of scaling factor to estimate number of subject categories required to map all of Cornell's holdings to HILCC (excerpt)

Subject code	Title count	Subject codes (split)	Subject codes (split) per 1,000 titles	Category 1	Category 2	Category 3
1203	13906	33	2.37	Languages & Literatures	English	American Literature
1130	13173	34	2.58	Languages & Literatures	English	English Literature
...	...	...	...	...	...	...
1113	1115	2	1.79	Social Sciences	Social Welfare & Social Work	Criminology, Penology & Juvenile Delinquency
1084	1059	3	2.83	Business & Economics	Economics	Industries
<b>Total (All Subject Codes With &gt;1000 Titles)</b>	<b>94823</b>	<b>272</b>	<b>2.87</b>			

Note: No fourth- and fifth-level subject categories appear in this table excerpt.

tially useful titles in greater bibliographic detail. The upper boxes in the frame at the right allow users to customize the layout of items on the two scatter plot axes by prioritizing two search variables. The lower box in the right frame displays additional bibliographic information pertaining to the book selected. Dushay's virtual book spine viewer provides both focus and context, and creates a browsing environment

that more resembles the traditional information space than other online browsing tools. It is one example of a next-generation browser that might allow for better and more useful access to retrieval sets that currently fill more than two or three results screens. Dushay and others doing research into browsing information systems could benefit from an examination of the extensive pre-Web research conducted

**Table 7.** Application of scaling factor to estimate number of subject categories required to map all of Cornell's holdings to HILCC (excerpt)

Subject code	Title count	Scaling factor	Total no. of subject codes (split) -- estimate	Category 1	Category 2	Category 3	Category 4	Category 5
1035.1	126156	2.87	362.07	Music, Dance, Drama & Film	Music			
1225.1	119708	2.87	343.56	Art, Architecture & Applied Arts	Fine Arts			
1267.1	112593	2.87	323.14	Languages & Literatures	East Asian & Ural-Altaic Languages & Literatures			
1536.1	103292	2.87	296.45	Sciences	Agriculture & Animal Sciences			
...	...	...	...	...	...	...	...	...
1503	1053	2.87	3.02	Law, Politics & Government	Military & Naval Science	Military Engineering		
1549.1	1019	2.87	2.92	Law, Politics & Government	Government (Non-U.S.)	Government (Canada)		
1258	998	2.87	1.00	Philosophy & Religion	Religion	North & South American Religions		
1221.11	976	2.87	1.00	Philosophy & Religion	Philosophy	Renaissance		
...	...	...	...	...	...	...	...	...
1532.1	135	2.87	1.00	Law, Politics & Government	Military & Naval Science	Space Warfare & Surveillance		
1100.2	119	2.87	1.00	Social Sciences	Recreation & Sports	Auto Travel & Racing		
1253.1	64	2.87	1.00	Social Sciences	Psychology	Psychotropic Drugs & Other Substances		
1009.6	30	2.87	1.00	History & Archaeology	Regions & Countries	United States	Local History	Territories, Protectorates, Etc.
<b>Total (All Subject Codes)</b>	<b>4462395</b>		<b>12772.91</b>					

on browsing online library catalogs, summarized by Kurth and Peters.<sup>15</sup>

## Conclusion

Although the research described in this paper stopped short of actually building and implementing an interface with which to provide bibliographic access to a virtual undergraduate collection, a library might put the Columbia and Cornell HILCC schemes to other uses. A complete histogram of hit rates across all HILCC categories, such as the one developed in this study, might be a useful tool for analyzing the subject scope of an existing collection—whether destined for undergraduates or delimited by other user or subject criteria. Further, if holdings in a given collection were mapped periodically against the same HILCC categories, the results might paint a revealing picture of how recent additions reflect (or do not reflect) the pre-existing or presumed subject orientation of that collection and how its subject focus might be changing. HILCC tables also could be used to analyze interlibrary loan trends and patterns (a use to which Columbia has reportedly begun to apply Cornell's revised HILCC scheme). One could even envision the merger of all three of these data sets into a single graph to track the direction of collection growth and demand over time.

There are clearly several directions in which further research might go. It is not yet clear whether the Cornell University Library will implement a HILCC-based interface to provide bibliographic access to its physically collocated current undergraduate collection or, in the future, to a physically dispersed collection, if space concerns on the central campus demand such redistribution of the physical material. As the Columbia University Library did, the authors invite other institutions to pick up where they have left off, to adopt and customize Cornell's modified HILCC scheme for use in their own collections and within their own institutional contexts, and to explore further the possibility of using scatter plot ZUIs, hyperbolic trees, and other information visualization techniques to present HILCC data optimally to the end user.

At a philosophical level, the problems with hierarchical classification, even with an improved display, run deep. Shirky recently argued in "Ontology Is Overrated: Categories, Links, and Tags" that the evolution of the Web itself shows the inherent brittleness of all attempts at authoritative classification for very large domains.<sup>16</sup> The most ambitious attempt at classifying the Web may be Yahoo!'s, but who uses their classification now? Rather than

trying to impose ordered classification on users, what may work better is to allow users themselves to classify things any way they see fit and to create order and paths of exploration derived from the raw data. The success of Google searching, based as it is on links across Web sites, is the best example of such an approach. Those who pursue further research on the creation of virtual collections will need to focus on this trend as well.

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# NACO Normalization

## A Detailed Examination of the Authority File Comparison Rules

Thomas B. Hickey, Jenny Toves, and Edward T. O'Neill

*Normalization rules are essential for interoperability between bibliographic systems. In the process of working with Name Authority Cooperative Program (NACO) authority files to match records with Functional Requirements for Bibliographic Records (FRBR) and developing the Faceted Application of Subject Terminology (FAST) subject heading schema, the authors found inconsistencies in independently created NACO normalization implementations. Investigating these, the authors found ambiguities in the NACO standard that need resolution, and came to conclusions on how the procedure could be simplified with little impact on matching headings. To encourage others to test their software for compliance with the current rules, the authors have established a Web site that has test files and interactive services showing their current implementation.*

Sharing data between bibliographic systems requires the ability to compare two pieces of information to determine if they are intellectually equivalent regardless of the ways in which they are stored. The authors attempted to compare data created by disparate systems but theoretically normalized by the same rules, and discovered discrepancies. Researching the problem headings revealed that the NACO normalization rules are vague in some aspects and possibly too restrictive in others. Three independently developed implementations of the Program for Cooperative Cataloging's (PCC) Name Authority Cooperative Program (NACO) normalization rules were brought into agreement with each other through the use of a common test environment, which the authors have made publicly available. Areas in need of clarification and simplification were identified during the testing.

Normalization rules can be used to create a standard or generic form for headings and other similar alphanumeric strings. This standard form is essential for clustering logically identical headings and differentiating between logically different headings. The need to determine the equivalence of two headings arises frequently in work with both name and subject authority files. What characteristics of the heading are significant? Should capitalization, spacing, and punctuation be ignored? What about special characters? Are *Smith-Jones* and *Smith & Jones* the same? What about *Black jack* and *Black, Jack*? Depending on which rules are followed and how they are implemented, these may or may not be considered equivalent.

Normalization is the transformation of a string of characters into a more generic form. Typical transformations include reducing all alphabetic characters to a single case and eliminating diacritics and punctuation. The justification for this is that minor differences between headings do not affect whether the headings are considered the same. In actual use, normalization rules go beyond simple string transformations and often take into account the context in which the strings are used. For example, should headings representing corporate enti-

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ties be unique not only from other corporate headings, but also from cross personal headings? The authors will focus on the basic string transformation rules.

A wide variety of approaches to normalization are used; some are very simple, others quite complex. A simple scheme is to retain only digits and alphabetic characters (as lowercase characters), dropping all other characters. Using this scheme, the string

A. Hann & Son (Bridgeton, N.J.)

normalizes to:

ahannsonbridgetonnj

This simple approach works well in many situations, but better options are usually available.

Several principles contribute to a good normalization algorithm. A normalization algorithm should be:

- Intuitive. The result is consistent with human judgment. Two strings that are generally perceived as equivalent produce the same normalized result.
- Simple. Normalization, especially when it is used across various systems or applications, is as simple and straightforward as possible.
- Repeatable. Running the normalization routine on previously normalized strings does not result in additional changes.
- Generalizable. The algorithm avoids content- or application-specific rules. This enables systems using the rule to more easily accommodate new types of data and promotes interoperability.
- Sortable. Ideally, the normalized strings can be used to sequence or sort the original entries.

Normalization can be used to meet the general need to group headings, titles, and other strings that are logically identical but have different representations. For example, one of the authors has a surname that contains two capitals and a special character, and is, therefore, often represented in a variety of ways, such as *Oneill*, *O'Neill*, *O'neill*, and so on. The simple scheme of retaining only alphanumeric characters would normalize these three variants to *oneill*, effectively grouping these variants.

Algorithms vary in their strength. Strong algorithms will generate the same normalized result for most variants, but may also include numerous mismatches, and weak algorithms often will fail to create the same result for all variants but will rarely mismatch strings. For example, the simple normalization algorithm discussed above would normalize *Edward O'Neill* and *Edwardo Neill* identically, while a weaker algorithm that retained spaces would produce different results for *O'Neill* and *O'Neill*.

The weaker algorithms may only standardize case and drop diacritics. The OCLC Online Computer Library Center (OCLC) search keys are an example of strong normalization.<sup>1</sup> Personal names are reduced to a 4, 3, 1 key containing the first four characters of the surname, the first three characters of the forename, and the middle initial. OCLC's search keys have been studied extensively, and much of that methodology is applicable to evaluating normalization algorithms. Llinas examined search keys in detail and provides a detailed review of related studies.<sup>2</sup> While these search keys are very effective at collecting variants, they generally lack precision.

In some cases, the data and normalization scheme are closely linked. This is the case with both the LC/NACO authority file and the Library of Congress Subject Headings (LCSH), both of which adhere to the NACO *Authority File Comparison Rules (NACO Normalization)*.<sup>3</sup> NACO participants create and maintain name authority records. NACO rules define the normalization procedures used to detect conflicts. Each established heading must be unique, and the file comparison rules are used to determine uniqueness. These rules are used not only to match variants, but also to define what differences are significant. By definition, if two headings have different normalized forms, they are different.

The NACO rules have been designed for use with bibliographic data and, in particular, with authority records. As a result, the NACO rules have a special status; they are the only widely used standard for normalization of bibliographic data. Because the rules are used to define what differences are significant, any deviation from the rules could produce erroneous results. Algorithms implementing the NACO rules must be accurately and consistently applied to avoid the creation of either duplicate or undifferentiated authorities.

## Bibliographic Applications

When all library operations were performed manually, some sort of normalization was done, either consciously or unconsciously, when establishing headings and filing the resulting entries. These were probably first codified as filing rules (for example, Cutter's *Rules for a Dictionary Catalog, ALA Filing Rules*).<sup>4</sup> As machine-readable cataloging and authority records began to be exchanged, a systematic way of normalizing headings was essential to improve matches and avoid inadvertent collisions of headings across systems. The Linked Systems Project developed the set of rules that have now become the NACO *Authority File Comparison Rules*.<sup>5</sup>

Appendix 1 of the PCC Cataloging Standing Committees of Automation and Standards Joint Task Group on Streamlining Authority Record Creation *Final Report*

reviews the rationale behind much of this work.<sup>6</sup> It cites the main aspects of normalization, which include determining:

- what to regard and what not to regard;
- how to treat case; and
- the conventions for translating special characters and symbols.

This is necessary in order for the headings to function properly for indexing and searching, and for checking for uniqueness.

### Motivation

As the authors began to investigate how best to implement the Functional Requirements for Bibliographic Records (FRBR) and plan authority control for the Faceted Application of Subject Terminology (FAST) subject heading schema, it became obvious that normalization would fill an essential role.<sup>7</sup> This led the authors to the NACO normalization rules used to establish these headings as they sought to match headings in existing records to those in the LC authority file.<sup>8</sup>

Over the years, OCLC has developed several implementations of the NACO normalization rules. Even within OCLC's Office of Research the authors found at least three versions written in different computing languages for different applications. Reviewing these implementations, the authors found discrepancies in how some headings were handled and realized that, without systematic testing, bringing the algorithms into agreement was impossible. The resulting NACO Normalization Testbed is the authors' attempt to share the results of this work with the rest of the library community.

### The Rules

The algorithm for normalizing headings is contained in Appendix A of the *NACO Authority File Comparison Rules*.<sup>9</sup> These rules are summarized in figure 1.

Figure 2 lists non-ASCII characters that are translated into the ASCII character set.

### Resolving Ambiguity in the Rules

A few unresolved issues exist at the character mapping level:

- The musical sharp, #, is now a separate symbol from the hash mark, #. The authors map both of these to the hash mark.
- The rules refer to the "logical OR" and "logical NOT" symbols, which do not appear to exist in the MARC character set.

The final results can depend on the sequence in which transformations are performed. The authors assume that the rules of stripping leading and trailing blanks and collapsing multiple blanks are done last, so that any blanks introduced during the processing are treated the same as original blanks in the data.

In addition, when processing bibliographic records, one needs to be able to handle data that are questionable or even ill-formatted, such as multiple uses of subfield \$a in names. If subfield \$a is used multiple times and the first reduces

ASCII characters:	Normalize to:
A-Z, a-z	Retain in single case*
Leading and trailing blanks, all diacritics, ' [ ]	Deleted
Super and subscript 0123456789	0123456789
Super and subscript +(-)	Blank
! ; ? ' " ( ) { } < > ; . / \ @ * % = ± ® £ \$ © ® °	Blank
Spacing characters ^ ` ~ _	Blank
Subfield delimiters	Subfield delimiters are retained, except for the one preceding the data. The associated subfield codes are deleted and field tags are retained only for the decision on what fields should be matched
Commas	The first embedded comma in the a subfield is retained, others become blank
0-9, # & +	Retained unchanged

\*The authors prefer lower case for readability.

Figure 1. Summary of NACO normalizations

	Characters											
non-ASCII input:	Æ,æ	Œ,œ	Ð,ð,ð	ı	Ł,ł,ł	Ø,ø,O,o	Þ,þ	Ů,ů	α	β	γ	ı
Normalizes to:	ae	oe	d	i	l	o	th	u	a	b	y	ı

Figure 2. NACO handling of non-ASCII characters

to nothing, is the trailing subfield delimiter retained? The authors' algorithm drops it. Does the "first comma" rule apply to the second subfield \$a? The authors only apply it to the initial subfield \$a. If a subfield reduces to nothing, or nothing but a blank, should the subfield delimiter be retained? The authors do not retain it. Is the comma retained if nothing precedes it after the other transformations have been carried out (the rules only talk about what to do when there is nothing following the comma)? The authors drop the comma in this circumstance.

### Effects of Various Rule Simplifications

How good are the NACO rules? They are quite good, but they lack both general applicability and repeatability. The fact that the rules explicitly rely on the MARC record structure limits their application. The "first comma in subfield \$a" rule and the retention of the subfield codes restricts their application to MARC coded fields. As cataloging becomes metadata creation with increased use of such non-MARC formats as Dublin Core, this cross-domain restriction becomes increasingly significant. For example, if the rules were applied to Dublin Core elements, the results could be different from those obtained from MARC fields, as Dublin Core records lack subfield coding.

Another important observation about the normalization rules is that they are very ASCII-oriented. After conversion, the original extended ASCII in MARC21 is a subset of printable ASCII except for the flat sign and subfield delimiters. By using "F" for the flat sign and a backslash for the subfield delimiter, the resulting string becomes much easier to process and display, with no loss of information. In the near future, the normalization rules will have to be extended for Unicode, and they are already causing problems with transliterated Chinese names.<sup>10</sup> Before such extensions, one must assess both the strengths and weaknesses of the current rules.

NACO specifies that the first comma in an \$a subfield is retained unless it is a terminal character. All other commas are converted to a blank. This first comma rule appears to violate several of the principles for a good normalization routine, particularly the repeatability principle. Repeatability requires the algorithm to leave a normalized result unchanged. Another way to view this principle is to require that any string (unnormalized, partially normalized, or fully normalized) will normalize the same. For example, repeated normalization will generate the following sequence:

```
$aMorrison, W. M. $q(William McCutchan),
$d1867-1918
morrison, w m$william mccutchan$1867 1918
morrison w m$illiam mccutchan$867 1918
...
morrison w m
```

Because the character following the subfield delimiter is deleted, the sequence ends only after all commas and trailing subfields have been removed.

The retention of the delimiter is also inconsistent with the intuitive and simple normalization principles, particularly when processing patron input data. Patrons are prone to omit subfield coding and would generally consider

```
$aMorrison, W. M. $q(William McCutchan),
$d1867-1918
```

and

```
Morrison, W. M. (William McCutchan), 1867-
1918
```

to be equivalent, although they normalize differently as:

```
morrison, w m$william mccutchan$1867 1918
```

```
morrison w m william mccutchan 1867 1918
```

Headings with explicit subfield coding (such as MARC records) will frequently normalize differently from headings with implicit subfield coding (such as card catalogs, many OPAC displays). With or without explicit subfield coding, these headings should generate the same normalized form.

In their FRBR work, the authors use NACO normalization to normalize titles as well as names. Non-name fields can also have subfields other than \$a as the first one, so they do not fit the comma processing rules very well. For titles, retaining the first comma is often undesirable.

### Application to the LC Name Authorities

The only obvious justification for retaining either the subfield delimiter or the first comma is that it prevents a significant number of conflicts. The authors investigated the effect of eliminating these two rules. The NACO file comparison rules were specifically developed for application with the LC authority files, both name and subjects. Because the name authority is larger, and its comparison rules simpler, the name authorities were used for further testing and evaluation. All personal names, corporate names, conference and meeting names, uniform titles, and geographic names except name–titles entries were analyzed—5,664,878 established headings and 4,162,130 cross-references.

The analysis focused on identifying conflicts of the NACO Authority File (2004 LC Distribution version). All established headings and cross-references were normalized following the standard rules, and all conflicts were collected

and analyzed. As specified in the file comparison rules, conflicts occur when two or more established headings normalize the same, or a cross-reference and an established heading normalize the same. Cross-references are not required to be unique; the same cross-reference can appear in multiple authority records.

Two files, one for established headings and the other for cross-references, were derived from the name authority file. Among other elements, each entry included the Library of Congress Control Number (LCCN) of the authority record, the original heading, and the normalized heading. For the cross-references file, any \$w subfields were ignored and duplicate cross-references were deleted resulting in a file of unique cross-references. Only 568 conflicts (0.01 percent of the established headings) between established headings were found. Some examples of the conflicts identified are:

100 Jayasree, S. [n 84109744]  
 100 Jayasree, S. [no2004124022]  
 100 Nguyen, Kim-Chi [n 78050801]  
 100 Nguy~^en, Kim Chi [no2004123058]  
 100 India [no 92007900]  
 151 India [n 80125948]

Even without normalization, almost half of conflicts observed, such as the first example, were exact matches. The other common pattern was where the same name was used for different types of names: *India* as a personal name versus *India* as a geographic name. Cases (in the second example above) in which the established forms were different but normalized the same were rare; only 183 conflicts of this type were observed. Therefore, variation in the implementation of the normalization routines does not appear to be a significant cause of these conflicts.

Conflicts between cross-references and established headings were more common; 4,424 conflicts of this type were observed. Some examples of these conflicts include:

130 Ship [n 83732520]  
 410 SHIP [Slater Hall Information Products  
 (Firm); n 88628681]  
 100 P. C. H. [nr 98022649]  
 410 P. C. H. [Partido Comunista de Honduras;  
 n 82166958]

100 Snail, A. [nb2003096351]  
 400 Snail, A. [Walker, Trevor M.; n 97016230]

As with the conflicts among established names, variation in the normalization procedures was not a significant cause of the conflicts.

To determine the potential impact of simplifying the rules, the process was then repeated using the simplified rules. The number of conflicts resulting from both the current rules and the simplified rules is shown in figure 3.

Some examples of the additional conflicts are:

100 Bastia, France [n 97025024]  
 151 Bastia (France) [n 79086801]  
 110 Seychelles Police Force. [n 85245780]  
 110 Seychelles. \$b Police Force. [n 85245771]  
 100 Rajhonson Ramiandrasoa [n 98900710]  
 100 Rajhonson, Ramiandrasoa [no2003060568]

Not all of the additional conflicts represented different entities. In the second, and probably third, examples, the headings represent the same entity. A quick review of the conflicting established headings pairs indicated that a high proportion were probably duplicate headings that should be merged. If both headings represent distinct entities, switching to the simplified rules would require additional qualification for at least one heading. However, the list is short enough and the error rate sufficiently high to make resolving the conflicts either by merging the duplicate headings or by further qualification of valid headings practical. Even when the headings clearly are different, they often appear similar enough to confuse many users. The fact that a significant proportion of these additional conflicts are likely to be duplicates indicates that these are also difficult, even for skilled catalogers.

The NACO rules prohibit conflicts between established headings (1xx fields from authority records) or between established headings and cross-references (4xx fields). No cross-reference can normalize the same as an established heading. The name authority file was also analyzed to determine the number of additional conflicts resulting from the use of the simplified rules, and the results are also shown in figure 3.

Simplification resulted in a huge increase in conflicts between established headings and cross-references, but,

Conflict type	No. of conflicts with NACO normalization	Additional conflicts with simplified normalization
Established heading to established heading	568	186
Established heading to cross-reference (internal)	628	44,235
Established heading to cross-reference (external)	3,796	1,304

Figure 3. Number of conflicts

in the vast majority of cases, the conflicts were between an established heading and a cross-reference within the same authority record. While the NACO rules specify that a cross-reference “may not normalize to the same string as any [established heading] in the same or another record,” the impact of intrarecord conflicts is very different.<sup>11</sup> A conflict between an established heading in one record and a cross-reference in another record does pose a serious problem by presenting contradictory information. Established headings are valid—cross-references are not. Internal conflicts, however, do not pose similar problems; for example consider the following:

```
010 n 81050809
040 DLC $b eng $c DLC
151 Naples (Fla.)
451 Naples, Fla. $w nmaa
```

In this authority record, using the simplified rules, both the established heading and the cross-reference normalize to “naples fla” because the \$w subfield is excluded. However, there is no real conflict. At worst, the cross-reference is redundant; at best, it indicates that the form of the heading has changed. These conflicts do not pose a serious problem and could easily be dealt with by changing the NACO rules to specify that a cross-reference “may not normalize to the same string as any [established heading] in *another* record.” All cross-references could be retained and no changes to the authority records would be required.

Switching to the simplified rules would then only require changing approximately 1,500 authority records. While not a trivial task, it is certainly possible. Immediately changing any records may not be necessary. Ignoring the internal conflicts, the simplified rules would increase the number of conflicts by only a third. Although these conflicts present a serious problem, catalogers have accommodated the current conflict rate without undue problems. It is not something that requires an instant solution.

### FAST Project

The simplified normalization has been applied in the FAST (Faceted Application of Subject Terminology) project. FAST is a new subject heading schema derived from the Library of Congress Subject Heading (LCSH). FAST retains the LCSH vocabulary, but in a simplified syntax, and is designed to be applicable outside of the traditional AACR-MARC environment—environments in which explicit subfield structure is rare. To function in these environments where subfielding could not be assumed, FAST adopted the simplified rules.

The simplified rules have worked very well in this application. There have been a number of conflicts (*Black*

*jack* versus *Black, Jack*), but they have been infrequent enough that they could be resolved by adding a qualifier to one of the headings. While adding the qualifier required extra work, FAST was improved by decreasing ambiguities. Many, if not most, of the conflicting headings would either be indistinguishable or confusing to the casual user.

### The NACO Normalization Testbed

In the spirit of Moen’s CIMI Z39.50 Interoperability Testbed, the authors have created a NACO Normalization Testbed to help the community come to a consensus on how the rules should be applied to headings.<sup>12</sup> The testbed ([www.oclc.org/research/researchworks/naco](http://www.oclc.org/research/researchworks/naco)) consists of:

- Files: Three files contain normalized and un-normalized strings that exercise aspects of the algorithm. The test cases demonstrate handling of all legal Unicode characters, the comma rule, and subfield delimiters. The test files were created according to a strict interpretation of the NACO rules. This means that the subfield delimiter is a 0x1F and the musical flat is an unprintable character.
- Code: Java and Python code is used to implement NACO normalization. These have been tested and produce consistent results with the test files.
- Demonstration Web page: The NACO Normalization Project service (<http://labs.oclc.org/nacotestbed>) (figure 4) allows visitors to input a heading and see the resulting normalized form. An option is available to invoke the simplified rules, where commas, subfield delimiters, and subfield codes are replaced with blanks.

### Conclusion

The NACO normalization rules provide a very effective means to compare established headings. Ambiguities in the rules lead, however, to inconsistent implementation. The sources of the variation from three independent implementations were examined, documented, and resolved. The resulting normalization software is publicly available in the NACO Normalization Testbed to assist the community in the consistent implementation of the normalization rules.

The suitability of the rules also was explored. The major limitation identified is their reliance on MARC encoding. Format independence is becoming increasingly important, as the use of other metadata schemas, such as Dublin Core, grows. In addition, the rules were found to be only marginally suitable when used to normalize titles, publisher names,

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**NACO Normalization Service** 

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**Input text here to normalize a single heading:**

(Use *MARCMaker* format to input subfield codes, e.g., '\$aMorrison, W. M. \$q (William McCutchan), \$d 1867-1918').

**Standard:**  morrison, w m\william mccutchan\1867 1918  
**Simplified:**  morrison w m william mccutchan 1867 1918

[Learn more about this service](#)

**Figure 4.** Screen shot of NACO Testbed

and other similar bibliographic entries. To overcome these limitations, two changes are proposed: dropping the first comma exception, and converting the subfield delimiter to a blank. With these relatively minor changes, the normalization rules would be suitable for almost any Latin-1 string, regardless of format. The relatively small increase in the number of resulting conflicts is viewed as acceptable to achieve generalizability and repeatability.

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# ARL Library Catalog Department Web Sites

## An Evaluative Study

Kavita Mundle, Harvey Huie, and Nirmala S. Bangalore

*User-friendly and content-rich Web sites are indispensable for any knowledge-based organization. Web site evaluation studies point to ways to improve the efficiency and usability of Web sites. Library catalog or technical services department Web sites have proliferated in the past few years, but there is no systematic and accepted method that evaluates the performance of these Web sites. An earlier study by Mundle, Zhao, and Bangalore evaluated catalog department Web sites within the consortium of the Committee on Institutional Cooperation (CIC) libraries, proposed a model to assess these Web sites, and recommended desirable features for them. The present study was undertaken to test the model further and to assess the recommended features. The study evaluated the catalog department Web sites of Association of Research Libraries members. It validated the model proposed, and confirmed the use of the performance index (PI) as an objective measure to assess the usability or workability of a catalog department Web site. The model advocates using a PI of 1.5 as the benchmark for catalog department Web site evaluation by employing the study tool and scoring method suggested in this paper.*

No library could function in today's information society without well-designed and well-maintained Web sites. Individual departments within the library also need adequate Web presence. Clientele for departmental library Web sites is different from the general library Web sites. For catalogers, their department Web site should provide access to sources for cataloging and classification, local policies and procedures, a departmental staff directory, and other useful and relevant information from within and outside the unit.

### Background

Although many catalog departments or technical services operations have developed their Web sites, the published literature reporting their existence, development, or design remains scanty. Catalog department Web sites act as a gateway to important local and external cataloging-related resources in an organized way. Catalogers use these Web sites to get information about their department and its local policies and procedures, find out about recent changes to rules, and educate themselves about emerging standards, new trends, and other developments happening in the field. Cataloging is a dynamic and constantly evolving field; thus, catalog department Web sites must undergo periodic assessments or evaluations to determine if updates or revisions are necessary. Although a few attempts were made in the past at evaluating general library Web pages,

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assessment of departmental Web pages, particularly those of technical services, catalog departments, or both, have been missing. The authors sought to bridge this gap with an earlier pilot study that evaluated the catalog department Web pages of thirteen member libraries of the Committee on Institutional Cooperation (CIC).<sup>1</sup> Their study proposed a model to evaluate the performance of a catalog department Web page and recommended desirable features for such Web sites. To assess their recommendations, and to test their model, authors of this paper studied a larger group of research libraries—members of the Association for Research Libraries (ARL), which includes the thirteen CIC libraries. The specific objectives of the current study were to:

- test the model devised previously by expanding the study to 123 ARL member institution libraries (including all CIC libraries); and
- assess whether recommendations made in the earlier study enhance the performance and workability of the catalog department Web sites.

ARL is a not-for-profit membership organization comprising most of the leading research libraries in North America. In the world of library and information sciences, ARL member libraries are leaders and early adopters as well as adapters of cutting-edge technology. Member libraries investigate, implement, and disseminate best practices; assess services; and monitor trends in the library world. Developments seen among ARL libraries often spread to other institutions. Although the individual member libraries differ in size and makeup, overall they share the same traditions of service, commitment of staff to lifelong learning, and broadening access to materials. These characteristics make ARL libraries a suitable study group for this study.

## Literature Review

Designing, creating, and maintaining catalog department Web sites is not an easy task. Among other things, frequently changing cataloging rules, paradigm shifts in the profession and the specialization, changing curricula, realignment of institutional priorities, and lack of monetary and human resources pose challenges. Literature addressing academic library Web sites has focused mainly on design and appearance, content, organization, and usability studies. Evaluative studies in the past have used investigator or end user perspectives while evaluating library Web sites.

### Investigator Perspectives

Many studies have highlighted the design aspects of Web sites. King scrutinized 120 ARL library main Web sites to

compare design similarities and differences.<sup>2</sup> His study concentrated on page background, document headers and footers, graphics, hypertext links, and page length. He found that the typical ARL site had 22 links on the main page. Stover and Zink reviewed 40 higher education library Web pages to assess the quality of design with respect to their trends, patterns, and anomalies.<sup>3</sup> In an interview with CNN reporter Kristie Lu Stout, Web page design guru Nielsen stated that the biggest mistake in Web design is not telling people what the site is about and what they can do on the site, being very indirect, and putting information in hypertalk.<sup>4</sup> He advised designers not to design the site for themselves, but for the average person. Johnson assessed 32 acquisitions department Web sites of academic libraries for page design, eye appeal, originality, and usefulness.<sup>5</sup> Concluding that many of these sites were conceived and mounted hastily, he argued for more thoughtfully designed Web sites and provided a useful checklist for developing a new site or evaluating and redesigning an existing site. Cottrell and Eisenberg studied the design of Web pages that facilitate information seeking and problem solving, and urged designers to agree on a basic set of objectives, such as “minimizing download time, avoiding flashing text or insufficient color contrast, keeping content near the top . . . [concentrating] on meeting the needs of their users.”<sup>6</sup>

Cohen and Still examined Web sites of 50 universities and 50 two-year colleges for their content and functionality.<sup>7</sup> They hypothesized that sites should serve as tools for information, reference, research, and instruction. They discovered a core common content, regardless of the type of institution; however, the scope and scale differed. The results showed that the Web sites of two-year colleges offer fewer resources compared to the resources offered by larger libraries, where users select from a vast number and variety of materials. Sweet provided directions for novice Web masters in developing and designing Web pages.<sup>8</sup> He advised them to look at other pages for ideas and remember that Web pages are primarily designed to distribute information to people.

### End Users Perspectives

Testing library Web sites for usability by involving users and their experiences is another area that is receiving considerable attention in the evaluation of library Web sites. Norlin and Winters provided suggestions for organizing testing groups and methods for testing and retesting of library Web sites.<sup>9</sup> They provided basic steps in designing and administering usability testing from beginning to end. McGillis and Toms tested the usability of the Memorial University of Newfoundland Libraries Web site with 36 participants who performed 6 tasks.<sup>10</sup> Results of their study showed that users found the information on the site not very intuitive; they

did not know where to begin, and they interacted poorly with the site. The authors concluded that libraries must take a systematic user-centered approach in developing their Web sites. An article by Benjes and Brown described a library Web site usability study at the University of Southern California, Norris Medical Library.<sup>11</sup> The authors tested the existing Web site and then tested the redesigned library Web site. The initial test results, with 7 participants, showed that users had difficulty in understanding the terminology, the navigation, and the color scheme of the library Web site. After testing the redesigned site, the researchers found that users learned more as they navigated through the site and the problems with the terminology lessened but were not completely eliminated. Another usability study by Travis and Norlin examined students' use of two electronic research library Web sites, Questia and Blackboard, and then compared it with two large university library Web sites—University of Arizona and California State University, Long Beach.<sup>12</sup> The major finding of the study was that the design of the site affected the success of students doing research. Students rated the University of Arizona as the best site, followed by Questia. The sites' overall design, navigation, and ease of finding specific information increased their usability. The study also showed that students often did not read the entire page, and instead looked for keyword, hyperlinks, or search boxes; they did not understand such terminology as "items" and "resources." Further, Wyman, Beachboard, and McClure studied federal library Web sites to learn which federal Web sites meet the needs of their users.<sup>13</sup> Their study developed evaluation tools that were based on user feedback and some technical criteria. The usability studies summarized above underscore the importance of designing user-centered Web sites, and showed that usability studies assist Web designers in developing intuitive and user-friendly Web sites.

### Technical Services Web Sites Evaluation

Published research on technical services and catalog department Web sites remains relatively uncommon. Two studies have reported the creation and the development of such sites. Council, Lang, and Scott described their experiences in building Web sites for their technical services departments at Fayetteville State University and University of Cincinnati respectively.<sup>14</sup> They covered the questions to be asked before developing a site, information to be collected, and responsibilities of creating and maintaining content. A study conducted by Harizan and Khoon outlined the process of creating a cataloging Web site at Nanyang Technological University in Singapore.<sup>15</sup> An article by Scheschy pointed to a wealth of information available on the Web that could be of interest to technical services librarians.<sup>16</sup> Scheschy provided a good overview of resources related to acquisi-

tions, cataloging, and serials, and also recommended that technical services staff create a home page to combine local information with access to remote sites.

Chressanthis and Wesley surveyed the technical services Web sites of National Association of State Universities and Land Grant Colleges members.<sup>17</sup> They tested accessibility, presence of hot links, webmasters' roles, and design details. They found that only 67 percent of members had technical services Web sites, and concluded that these pages serve as public relations tools and as content-rich information resources. A study by Wang and Gao examined 60 randomly selected academic library Web sites from June to July 2003 and found that only 12 had technical services Web sites.<sup>18</sup> They concluded that larger research institution libraries are more likely to have a technical services Web presence than other libraries. A study by Mundle, Zhao, and Bangalore proposed an objective measure called the performance index to measure the effectiveness of a catalog department Web site.<sup>19</sup> The study applied the index to 13 CIC Web sites and recommended features that would enhance the workability of a catalog department Web site.

To test the validity of the evaluation model proposed by Mundle, Zhao, and Bangalore, and to verify their recommended features for a catalog department Web site, the present authors undertook a larger study of 123 ARL libraries. This study takes into account the investigators' evaluation perspectives, which in this case are the authors of this study.

## Method

To test the validity of the evaluation model, the present study evaluated the catalog department Web sites of ARL member institution libraries. The study tool consists of four parameters: accessibility, design and structure, internal documentation, and external resources. The individual queries were designed to gather well-rounded information about each parameter. Accessibility assessed multiple links to and from the catalog department Web pages. Subsequently, design and structure evaluated the esthetics, such as graphics. While internal documentation elucidated information regarding catalog department operations and its internal resources, external resources parameter emphasized the availability of information for the professional enrichment of catalogers.

### Study Design

A template (see appendix) was used to gather data from all ARL member institution Web sites. The current study instrument used the same template developed for the pilot study, with minor modifications, and added one question to

the accessibility parameter—whether a catalog department Web page was linked from the library's Web page. Further in the same parameter, the option "Tech services only" was added to the original question ("Is the page linked to Technical Services Web page?") Additionally, for the question "When was it [Web page] last updated," the responses were grouped into three categories of "0–3 months ago," "3–6 months ago," and "over 6 months." Further, in the internal documentation parameter, the word "resources" was added to the question, "Does it provide links to the cataloging tool such as?" For clarity purposes, individual questions in each parameter were numbered.

The template was in the form of a questionnaire. Of 32 questions, 24 questions were either answered "yes" or "no"; 2 "yes," "no," or "somewhat"; 1 question had "yes," "no," or "technical services only" response; and 5 had nominal answers. Each of the three investigators examined the Web sites from November 1 through December 16, 2004, and independently rated the same Web sites on the same day. In addition, each Web site was reviewed only once, and any updates made to any Web site after being evaluated were not taken into consideration. The investigators compared their findings and determined the final ratings. In a few instances, the technical services or catalog department heads were contacted to obtain access to the catalog department pages that could not be located through a library site search or a Web engine search. The Web sites of 25 institutions could not be accessed because these sites were on their intranet, and access was denied due to institutional policies and password restrictions. Additionally, 2 of the other Web sites also could not be accessed because one had a broken link and the other site was under construction. Thus, no further analysis was possible beyond evaluating user accessibility in these 27 Web sites. Six institutions had no Web sites for their catalog departments or technical services units, and 3 institutions did not respond to inquiries. As a result, 36 Web sites were not studied, other than to be assessed for outside user access. Four of the 87 Web sites were undergoing revision at the time of testing. In cases of institutions with multiple campuses, only the main campus library Web site with corresponding catalog department or technical services Web sites were taken into consideration. For institutions that did not have a separate or a dedicated Web page for the catalog department, cataloging-related information was evaluated from their technical services Web sites. Because these technical services Web sites were organized either by sections or by function, it was easy to ascertain which links provided cataloging related information.

### Scoring Study Responses

A rating scale was used to score individual responses. In the 24 "yes" or "no" questions, a rating of "yes" was scored

as 2 and "no" as 1. In the case of the design and structure parameter, for the two questions that had a rating "somewhat" (that is between "yes" and "no"), a score of 1.5 was assigned. Additionally, while scoring the question, "Is the page linked to Technical services Web page?" under the accessibility parameter, for a "Tech services only" response, a score of 1.5 was used and only cataloging-related information was evaluated. For the few publicly accessible Web sites that consisted of only a single page, uniformity in the design could not be fully addressed. In these cases, a score of "0" (zero) was used for the following questions, "Does each page have the same header and footer?" and "Does each page have the same background color?" Moreover, many catalog department Web sites exhibited a mix of direct as well as indirect links to external resources. Direct links connect to the actual resource (reference tools, professional journals and literature, professional organizations) via a single link and were scored as 2. Indirect links require multiple clicks, often via an initial link to an outside resource or portal, such as, "Internet library for Librarians" or "Catalogers' toolbox," and were scored as 1.5. A percentage of institutions under each scoring category for every question (by individual study parameter) was determined and plotted.

Special consideration was given while scoring the five nominal questions. For the question "Who designed the Web page?" (design and structure parameter), the responses were grouped into one of these four categories: Catalog Department, Library Systems, Outside Agency, or Can't decide. Then a percentage response was calculated for each specific category. In the case of the question, "When was the page last updated?" (design and structure parameter), all responses were sorted by their date and grouped as "within three months," "between three to six months," or "over six months," and respective percentages were calculated for each. While scoring a question under internal documentation, "Does it include contact information?" (e-mail, phone number, fax number, and mailing address for a given Web site), the presence of all forms of contact was scored as "yes," absence of all forms of contact information was scored as "no," and the presence of one to three forms of contact information was scored as "incomplete." Then for each Web site, the percentage of each category was determined (for example, scores, 2, 1, 1.5). Local policies and procedures information was organized either alphabetically, by format, or by subject. For every Web site, a percentage response was calculated for each method of organization in order to obtain an answer to the nominal question, "How are they [policies and procedures] organized?" For the question, "Does it [Web page] provide links to cataloging resources or tools?" a percentage response was calculated for each cataloging resource, such as Online Computer Library Center (OCLC), Library of Congress (LC), Machine-Readable Cataloging (MARC), Cooperative Online Serials Program

(CONSER), Name Authority Component (NACO), Monographic Bibliographic Record Component (BIBCO), Subject Authority Component (SACO), and others. Links to these resources not only provide cataloging-related information, but also act as tools to help with cataloging.

### Statistical Analysis

Statistical data analysis was performed to assess the validity of the study tool, ascertain if any interrelationships among individual study parameters exist, and rate the performance of individual Web sites. A “*P* value” of <0.05 was considered significant in all the statistical applications.

- **Determination of the Performance Index (PI).**

For each institution, a mean score for a specific study parameter (accessibility, design and structure, internal documentation, external resources) was calculated based on the scores of individual questions under that study parameter. Subsequently, the performance index (PI) was determined as the mean of scores of all four study parameters for every individual institution.

- **Determining interrelationships among study parameters.**

Spearman’s correlation coefficient test was used to determine the interrelationships among the four study parameters for the entire group of 87 institutions. Further, to determine the relative impact of individual study parameters on the PI, again using Spearman’s correlation coefficient test, correlation between every study parameter and PI was assessed.

- **Categorization of institutions into low, average, and high performers.**

The mean PI and its standard deviation (SD) were calculated for the entire group of 87 institutions. Subsequently, values for mean – SD and mean + SD were determined as the lower and the upper limit of the range of average PI. The institutions with PI falling in the range (mean ± SD) were thus grouped as average performers. Those with PI less than the range (< mean – SD) were grouped as low performers, while those with PI more than the average range (> mean + SD) were grouped as high performers.

- **Comparing high, low, and average performers.**

The mean scores of individual study parameters in all three groups—high, low, and average performers—were compared. An independent sample student’s “*t*” test was utilized to see if the mean scores in the individual study parameters in all three groups differ significantly.

- **Identification of the highest and the lowest performing Web sites within their respective groups, the**

performance index of individual institutions in both the groups was compared with the average PI of the entire group of 87 institutions using a paired sample “*t*” test.

## Results

The 36 Web sites that could not be accessed were rated only on the accessibility parameter, but were excluded from the final analysis. To normalize the relative proportion of responses in individual parameters for all institutions, percentage responses were plotted.

### Analysis of Individual Study Parameters

#### Accessibility

As seen in figure 1, 70.7 percent (87 of 123) of all Web pages in the study provided access to outside users. Henceforth, percentages are determined using the 87 libraries that provide access. Of the catalog department Web pages, 89.6 percent (78 of 87) had a link to their main library Web page. Only 73.6 percent (64 of 87) of the Web pages were linked from their main library’s Web page (i.e., the first library page visible to the public). The links either led directly to catalog department Web pages or to technical services Web pages. Moreover, 18.4 percent (16 of 87) of the libraries opted to have a centralized page for technical services rather than having a separate page for the catalog department. Interestingly, 63.2 percent (55 of 87) of the catalog department Web pages were not linked to their technical services Web pages and 71.3 percent (62 of 87) of the Web pages provided a link to their institution or university Web page.

#### Design and Structure

Predominantly, the Web pages of individual libraries were uniformly designed with the same header and footer (67.8 percent; 59 of 87) and background color (69 percent; 60 of 87) throughout, as seen in figure 2. Eighty-six percent of the Web pages showed good navigational features. A majority (59.8 percent; 52 of 87) had a search function capability that helped in easy navigation of the site. Only 35.6 percent (31 of 87) of the Web pages had interactive forms for reporting cataloging errors, requesting a rush cataloging, or other forms, such as for requesting a purchase of a book or a journal. One of the striking features observed is the absence of graphics on all ARL Web pages studied. A significant 96.5 percent (84 of 87) did not have any graphics that might (or might not) enhance the visual appeal of the Web page. Very often, the choice of font type and background color is governed by the institutional Web page development standards. The researchers found that in 29.9 percent (26 of 87) of

the cases, fonts and background color added to the overall appeal of the pages. They rated 56.3 percent (49 of 87) of the Web pages moderately or reasonably appealing with respect to their fonts and background color. Catalog department personnel designed 43.7 percent (38 of 87) of the Web pages, library systems unit staff designed 12.6 percent (11 of 87), and an outside agency designed 5.7 percent (5 of 87) of the Web pages. A majority of the Web pages, 57.5 percent (50 of 87), were updated within three months of the study, 16.1 percent (14 of 87) were updated between three to six

months before the study, and 17.2 percent (15 of 87) were updated more than six months before the study was conducted. Of the 8 remaining Web sites, 2 sites were updated in 2004, but had no specific date mentioned, and 6 of the Web sites did not mention when they were updated.

Internal Documentation

As seen in figure 3, 83.9 percent (73 of 87) of the Web pages described the mission of the catalog or technical services department. A significant majority (95.4 percent; 83 of 87) of Web sites had some form of contact information. In 81.6 percent (71 of 87) of the Web pages, the information on local policies and procedures was presented in great detail. These policies and procedures were arranged either alphabetically by subject or by format. Since this nominal question was not scored, the data was not plotted in figure 3. Links to various cataloging tools for catalogers' consultation were seen in 83.9 percent (73 out of 87) of the Web sites. Only 9.1 percent (8 of 87) of the Web sites had cataloging cheat sheets. Annual reports or statistical information about the department were provided in 34.5 percent (30 of 87) of the Web sites, and only 21.1 percent (19 out of 87) offered links to various meeting minutes. Moreover, only 11.5 percent (10 of 87) pages provided links to a "Department Newsletter." Information about on-going departmental projects was available on 20.7 percent (18 of 87) of the Web sites. Only 17.2 percent (15 of 87) of the sites posted a training or trainer's manual online.

External Resources

Many catalog department Web sites displayed a mix of direct as well as indirect links to external resources. Overall, 26.4 percent (23 of 87) of Web sites exhibited no links to any of the external resources mentioned in the study tool, 3 of the Web sites provided only indirect links to the external resources, 6.9 percent (6 of 87) showed direct links to all external resource categories, and 63.2 percent (55 of 87) Web sites displayed a mix of direct, indirect, or no links to the various external resources categories.

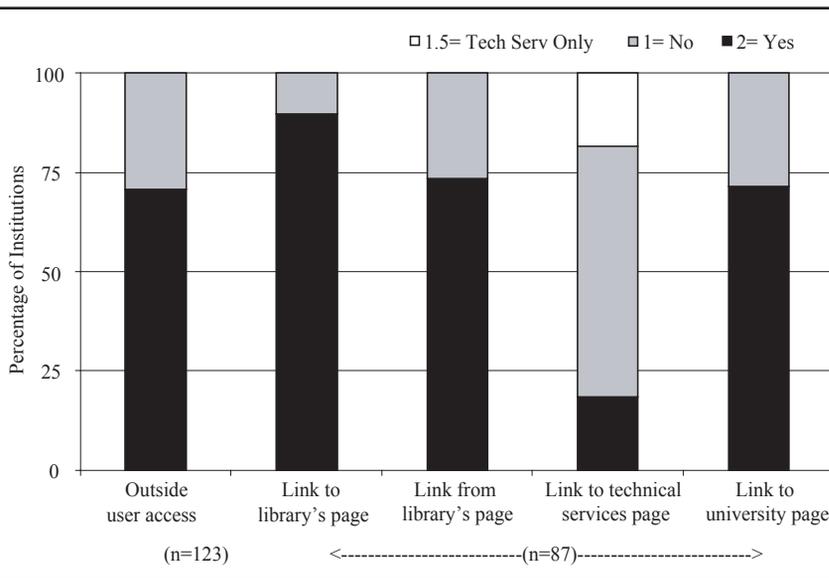


Figure 1. Accessibility

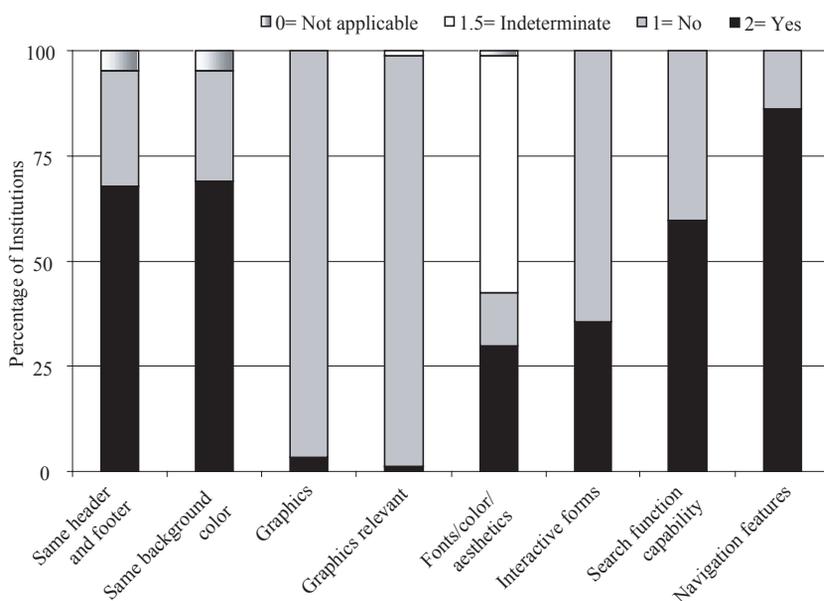


Figure 2. Design and structure

Figure 4 illustrates the percentages of direct, indirect, or no links in each category in greater detail. As shown in figure 4, 70.1 percent (61 of 87) of the Web pages provided links to reference sources, such as language dictionaries or encyclopedias; 38 provided direct access, and 23 provided indirect access. Links to outside technical services or catalog department Web pages were present in 66.6 percent (58 of 87) of the Web pages; 41 provided direct access, and 17 provided indirect access. Another 66.6 percent of the pages provided links to professional journals and literature. About 65 percent of the sites linked to helpful electronic discussions lists, like AUTOCAT, SERIALST, and others (32 percent direct and 33 percent indirect). Further, 65 percent of the Web sites provided links to professional organizations (e.g. American Library Association (ALA), Medical Library Association (MLA), and North American Serials Interest Group (NASIG) (direct, 34 percent, and indirect, 31 percent).

**Assessment of Interrelationships between Individual Study Parameters and Performance Index**

A relative proportion of responses for every parameter for every institution was determined by calculating percentages. To illustrate, 78 of 87 catalog department Web pages linked to the library's Web page, for a percentage of 89.7. Then, an average score for a specific parameter was calculated for every institution. For example, if an institution had scored 2 for every question on the accessibility parameter, then the average score for accessibility of that institution is 2. Finally, the performance index was determined as the mean of scores for all four study parameters in individual institutions (n=87). For example, if an institution had a score of 2 for accessibility, 1.7 for design and structure, 1.7 for internal documentation, and 2 for external resources, the performance index (the mean score of all four parameters) would be 1.85, which would be rounded off to 1.9 to avoid robustness of data for the scope of this study. In all subsequent statistical analyses, however, the calcula-

tions are used up to two decimal points. Subsequently, the interrelationships among all 4 study parameters and the performance index of every institution were assessed using Spearman's correlation coefficient test. A positive correlation was observed between the internal documentation and

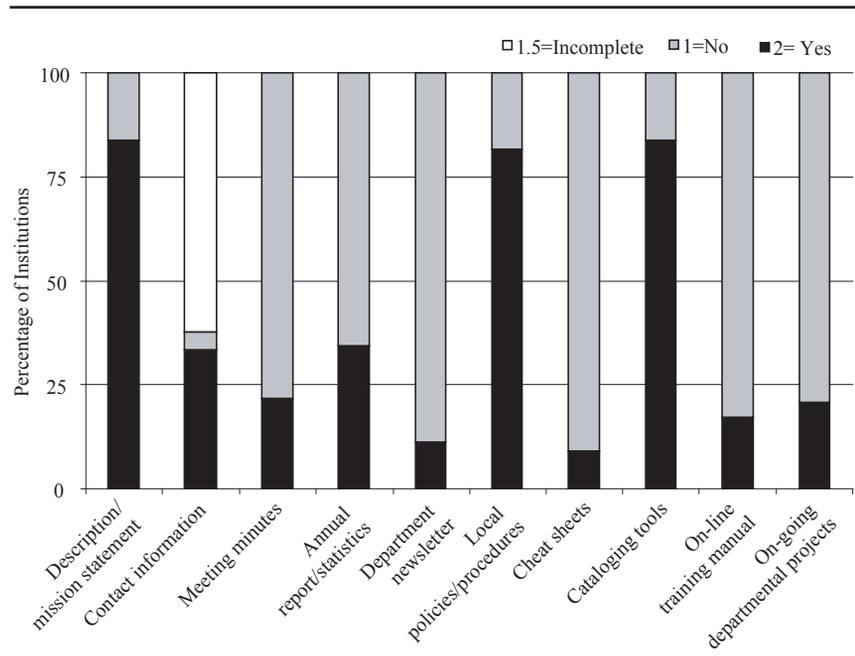


Figure 3. Internal documentation

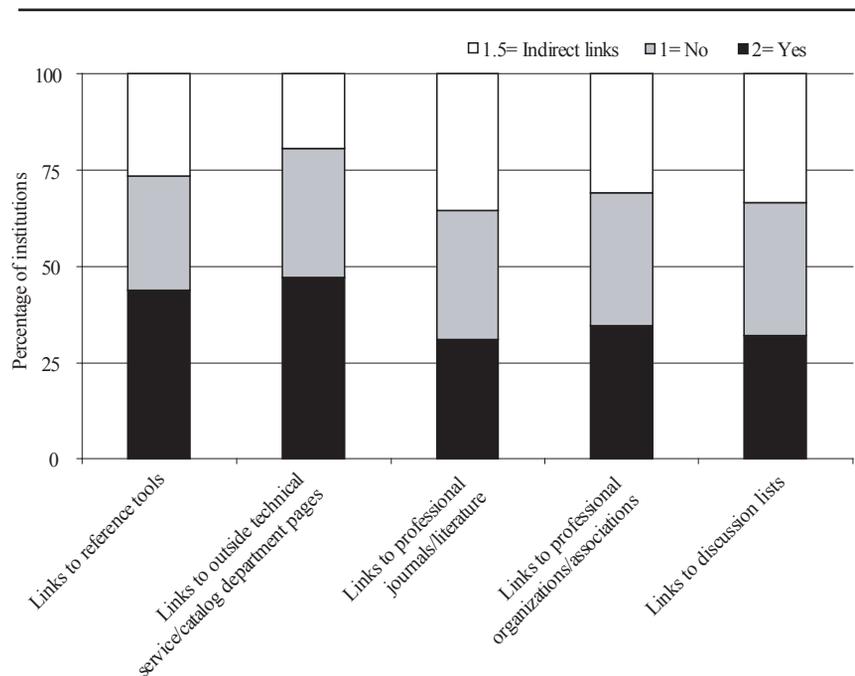


Figure 4. External resources

external resources study parameters (correlation coefficient “ $r$ ” = 0.209,  $p$  = 0.05). This observation parallels the authors’ earlier finding.<sup>20</sup> Moreover, the performance index was significantly correlated with all four study parameters: accessibility (“ $r$ ” = 0.43,  $p$  < 0.001); design and structure (“ $r$ ” = 0.46,  $p$  < 0.001); internal documentation (“ $r$ ” = 0.49,  $p$  < 0.001), and external resources (“ $r$ ” = 0.70,  $p$  < 0.001). This finding indicates that all parameters significantly influence the value of performance index, which in turn determines the workability of a Web page. Of all the parameters, access to external resources showed the highest correlation coefficient indicating most cogent relationship with the PI.

### Determination of Mean Performance Index and Categorization of Study Subgroups

The performance index of the 87 institutions studied ranges from 1.2 to 1.9. In order to rank the performance of individual Web pages, first the mean performance index for the entire group was determined. It was found to be 1.54, which is in line with the earlier study.<sup>21</sup> Further, to subgroup the institutions on the basis of PI, the range for average performance was calculated as mean PI  $\pm$  standard deviation of the mean (1.54  $\pm$  0.13). Accordingly, the institutions with PI between 1.41 and 1.67 were grouped as the average PI group (i.e., PI = 1.5 and 1.6;  $n$  = 50). The institutions with PI < 1.41 were regarded as the low PI group (i.e., PI = 1.2, 1.3, and 1.4;  $n$  = 16) and those with PI > 1.67 were categorized as the high PI group (i.e., PI = 1.7, 1.8, and 1.9;  $n$  = 21).

### Comparison of Different Study Subgroups

The mean PI of individual study parameters differed significantly in the three groups. Further, individual study parameters in low and high PI groups were compared with the average PI group using independent sample student’s  $t$ -test. As shown in table 1, mean scores for all four study parameters were found to be significantly different in the three groups. This again substantiates the observation that each of the four parameters has a significant bearing on the PI and hence on the workability of a Web page. The mean scores

for accessibility, design and structure, and internal documentation in the three groups showed a pattern of steady difference from low to average to high PI groups (see figure 5). The mean of external resources manifested a noticeably pronounced difference in the three groups. Whereas 75 percent (12 of 16) institutions in the low PI group did not show links to any external resources, all institutions in the high PI group consistently showed links to various external resources, with more than 75 percent institutions scoring extremely high on the study tool.

### Testing the Recommendations of the Previous Study

The authors’ earlier study on evaluating catalog department Web sites of CIC libraries recommended that a catalog department Web site should have:

- access through the library Web site, when permitted;
- intuitive navigational features;
- relevant and updated content through internal documentation (including contact information and local policies and procedures, cataloging tools); and
- links to external resources (including links to professional literature, professional organizations).

They also suggested that the following features would enhance the usability and appeal of a Web page:

- search function capability;
- interactive reporting of cataloging errors; and
- uniformity in design and appearance of Web pages within the site.<sup>22</sup>

The present study tested these recommendations against all 87 Web sites of ARL institution libraries in the present study; the results are presented in table 2. Of all the recommendations, contact information was the best addressed feature. Contact information was based on Web sites having at least one of the features (e-mail, phone number, fax, and mailing address). Preference was given to e-mail (92 percent; 80 of 87), phone number (90.8 percent; 79 of 87), and

**Table 1.** Comparative profile of mean scores for four parameters and PI in three study groups

Study groups	Accessibility	Design and structure	Internal documentation	External resources	Performance index
Low PI ( $n$ = 16)	1.61 $\pm$ 0.05 ( $p$ = 0.027)	1.29 $\pm$ 0.06 ( $p$ = 0.002)	1.34 $\pm$ 0.05 ( $p$ = 0.038)	1.11 $\pm$ 0.06 ( $p$ < 0.001)	1.33 $\pm$ 0.02 ( $p$ < 0.001)
Average PI ( $n$ = 50)	1.72 $\pm$ 0.02	1.47 $\pm$ 0.02	1.44 $\pm$ 0.02	1.53 $\pm$ 0.05	1.55 $\pm$ 0.01
High PI ( $n$ = 21)	1.83 $\pm$ 0.03 ( $p$ = 0.005)	1.58 $\pm$ 0.04 ( $p$ = 0.028)	1.59 $\pm$ 0.03 ( $p$ = 0.001)	1.82 $\pm$ 0.03 ( $p$ < 0.001)	1.72 $\pm$ 0.01 ( $p$ < 0.001)

Note: Values expressed as Mean  $\pm$  Std. Error of mean; P value as compared to corresponding values in Average PI Group.

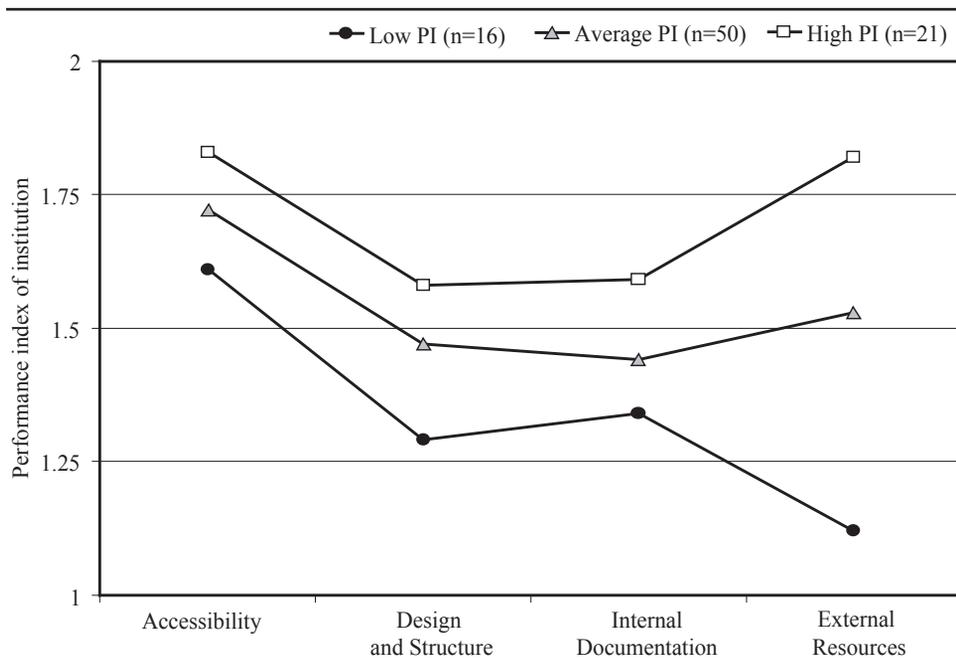
mailing address (70.1 percent; 61 of 87). Similarly, links to cataloging resources or tools were based on the number of Web sites that had at least one related link. The most attention was given to tools like OCLC (78.2 percent, 68 of 87), LC (77 percent, 67 of 87), and MARC (65.5 percent, 57 of 87), CONSER (32.2 percent, 28 of 87), NACO (29.9 percent, 26 of 87), SACO (23 percent, 20 of 87), and BIBCO (20.7 percent, 18 of 87). Only two pages had links to the National Library of Medicine (NLM) and Medical Subject Headings (MeSH) and none had a link to the Dewey Decimal Classification (DDC) system. With regard to the enhanced features, 69 percent (60 of 87) of the Web pages appear to be uniformly designed with respect to their headers and footers and background color information.

### Identification of the Highest and the Lowest Performing Institutions

Among the low and high PI groups, the PI of individual institutions was compared with the mean PI of the entire group of 87 institutions. A paired sample “*t*” test showed significantly high PI for three institutions ( $p=0.018$ ,  $p=0.024$ ,  $p=0.015$ , respectively) and significantly low PI for two institutions ( $p=0.029$  and  $p=0.046$ , respectively). The absence of graphics, and the absence of “Department Newsletter” were the only two negative points noted in all three highest performers and in the two lowest performers. Graphics take a longer time to load—for this reason, some institutions may not have them on their Web pages. The highest and lowest performers were compared against the recommendations made in the authors’ earlier study. The three high performers scored meritoriously on all recommended and also on enhanced features (see table 3). The two low-performing institutions scored weakly on all recommended features. Although the two low performers had detailed local policies and procedures information, lack of a search function capability, contact information, and links to external resources lowered their performance. One of the lowest performing sites was not fully developed as it had just been mounted, which may have affected its overall performance.

**Table 2:** Percentage of ARL library web sites showing recommended and enhanced features (n=87)

Features	Percentage of sites
<b>A) Recommended</b>	
Access from library Web page	73.56
Intuitive navigational features	86.21
Contact information	95.40
Local policies/procedures	81.61
Links to cataloging tools	85.06
Links to professional organizations	65.52
Links to professional journals/literature	66.67
<b>(B) Enhanced features</b>	
Search function	59.77
Interactive reporting of cataloging errors, rush cataloging request forms	35.63
Uniform header and footer	67.82
Uniform background color	68.97



**Figure 5.** Mean PI of high, average, and low ranked institutions

## Discussion

This study validated the model previously proposed by the authors, and also confirmed PI as an objective measure of a Web site's usability or workability. A PI of 1.5 has emerged as an average score. This report suggests that a PI of 1.5 could be used as a benchmark when a Web site's performance is analyzed by using the study tool and the scoring system suggested in this paper.

The need for standardizing Web page design and content is emphasized in the library literature. Balas pointed out that "standards [may] stifle innovation and creativity, and . . . that a rigid standard that cannot be extended to include new technologies has no place in our increasingly digital world. However, in order to have all the pieces of our world of digital information work together smoothly and seamlessly, we need well-developed, extendable standards."<sup>23</sup> Thus, in the light of Balas's comment, the study tool and the PI provide a framework for standardization that allows flexibility to meet local needs and serve as a useful guide to catalog librarians in developing Web sites for catalog departments.

The efficiency, effectiveness, and user-friendliness of any Web site are the key factors that determine its success or performance. Most Web evaluation studies focus on evaluating Web site usability by measuring its design, organization of content, navigational features, graphics, user-friendliness, and links relevant to the intended users.<sup>24</sup> All these features are well-represented in the study tool in the form of four parameters—accessibility, design and structure, internal documentation, and external resources. The PI, which is the mean of scores of all study parameters, not only determines the usability or workability of the Web page, but also deter-

mines the degree to which a catalog department Web site meets the needs of that department.

Considerable effort is required to maintain and update Web sites. To keep Web sites active and dynamic, Ryan proposed that a library should develop and follow a regular schedule of maintenance and update procedures.<sup>25</sup> She also asserted that, although many pages will be updated on an as-needed basis, all departmental and informational pages should be verified at least once a semester. The present study showed that a majority of the Web sites, 57.5 percent (50 of 87) were updated within the last three months of study. Thus, a use of PI for periodic evaluation of a catalog department Web site could easily fulfill Ryan's recommendations.

Of all parameters, the external resources showed the highest correlation ( $r=0.70$ ) with PI. Statistically speaking, the higher the score of external resources parameter, the higher the PI score. Of 87 Web sites studied, 23 Web sites showed no links to external resources. This skews the correlation of the external resources parameter on the PI values for those Web sites, but the study tool still would validly assess how catalog departments performed on the external resources parameter by scoring "1" (indicating "no" response) on the external resources parameter.

Another interesting finding—how institutions differ in the number of links they provide to various external resources and whether they link directly or indirectly—deserves special mention. The differences in their practices could be attributed to a variety of reasons. Institutions may design Web sites specifically for support staff, professionals, or both; they may cater to a specific audience, which may affect the types of materials they catalog; they may have concerns

**Table 3:** Comparison of recommended and enhanced features in highest and lowest performers

Features	Number of institutions showing the presence of a feature	
	Highest Performers (n=3)	Lowest Performers (n=2)
<b>(A) Recommended</b>		
Access from library Web page	3	0
Intuitive navigational features	3	1
Contact information	3	0
Local policies/procedures	3	2
Links to cataloging tools	3	0
Links to professional organizations	2	0
Links to professional journals/literature	3	0
<b>(B) Enhanced</b>		
Search function	3	0
Interactive reporting of cataloging errors, rush cataloging request, etc.	3	0
Uniform header and footer	2	2
Uniform background color	3	2

about the time spent in updating the external resources links due to staff shortage and shrinking budgets; and they may not want to duplicate the effort, as other comprehensive sites already exist for ready reference. These factors do influence the overall scoring of the external resources parameter and thereby affect the value of the performance index.

A positive correlation observed between internal documentation and external resources study parameters corroborates the observation in the authors' previous study.<sup>26</sup> These two parameters serve different purposes and complement each other. Information contained within internal documentation helps catalogers increase their job efficiency or functionality and their awareness about the department. At the same time, external resources provide diverse information that helps catalogers in their professional growth and development, and emphasizes institutional attention to the professional development of the catalogers. The study tool comprehensively and effectively assesses internal documentation and external resources.

The validity of any evaluative study tool is based on two factors: (a) if each question in the tool can elicit a unique clear answer, and (b) if each question affects the final outcome for which the study tool is intended. With respect to the study tool, the final outcome is the PI that measures the workability of a Web site. While evaluating all 87 ARL Web sites, each individual question received a unique answer that could be scored directly. A statistically significant positive correlation of each study parameter with the PI thus offered comprehensive validation of the study tool developed by the authors.

Among all 87 institutions (see table 2), contact information was the most prevalent of the recommended features. Similarly, with the enhanced features, 68 percent of the pages showed uniformity in the overall design of Web pages with respect to their enhanced features. Further, the three highest performers (see table 3) fulfilled almost all the recommendations (except one site, which had indirect links to professional organizations) and exhibited almost all of the enhanced features (except one site, which lacked uniformity in the header and footer design) and thus ranked higher among all 87 institutions. Conversely, although the two low performers had detailed local policies and procedures, showed uniformity in the overall design aspect of the Web sites, and one of the Web sites had good navigational features, both lacked in the other recommended features. Thus, these observations further support the authors' recommendations about "recommended" and "enhanced features" for a catalog department Web site. Furthermore, these findings illustrate the effectiveness and the usefulness of the study tool and substantiate the model proposed for the evaluation of catalog department Web sites.

## Conclusion

The present study validates the model proposed by the authors in their pilot study for the evaluation of a catalog department Web site. The study also confirms the use of PI, which is the mean of scores of all study parameters, as an objective measure of usability and workability of a Web site. The proposed model serves as a useful guide to catalog librarians in developing and maintaining Web sites for catalog departments that have standard features. The model advocates using the study tool described, determining the PI based on the scoring system suggested, and then comparing the PI of a Web page with the average PI of 1.5 to ascertain the performance of an individual Web site. All the study parameters included in the study tool (accessibility, design and structure, internal documentation, and external resources) greatly affect the performance index of a catalog department Web site. Moreover, each question in the study tool seeks a unique answer that in turn affects the value of the performance index and thus underscores the study tool's comprehensiveness and efficacy.

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## Appendix: Template for Evaluating Catalog Department Web Pages

### Accessibility

1. Can outside users access the Web page?  Yes  No
2. Is the page linked to library's Web page?  Yes  No
3. Is the page linked from library's Web page?  Yes  No
4. Is the page linked to Technical Services Web page?  Yes  No  Tech Services only
5. Is the page linked to university Web page?  Yes  No

### Design and Structure

6. Is the page uniformly designed:
  - Does each page have the same header and footer?  Yes  No
  - Does each page have the same background color?  Yes  No
7. Does it have any graphics?  Yes  No
  - Are the graphics adding any relevancy to the page?  Yes  Somewhat  No
8. Do fonts, background color add aesthetics to the overall design of the page?  Yes  Somewhat  No
9. Who designed the Web page?  Cat  Dept.  Lib  Syst.  Outside Agency  
 Can't Decide
10. When was it last updated?  0-3 months ago  3-6 months ago  
 more than 6 months ago
11. Does the page have any interactive form for reporting cataloging errors, requesting rush cataloging, or other queries?  Yes  No
12. Does it have a search function capability?  Yes  No
13. Are there any navigation features present?  Yes  No

### Internal Documentation

*Does it include:*

14. Description/Mission statement of the department?  Yes  No
15. Contact information (e-mail, phone, fax, mailing address)?  Yes  No
16. Meeting minutes?  Yes  No
17. Annual Reports/Statistics?  Yes  No
18. Department newsletter?  Yes  No
19. Does the page have local policies and procedures?  Yes  No
  - If yes, proceed further:*
  - Are the policies detailed?  Yes  No
  - How are they organized?  Format  Subject  Alphabetical
20. Are there any cheat sheets provided?  Yes  No
21. Does it provide links to the cataloging resources or tools such as OCLC, LC, NLM, MeSH, DDC or any others?  Yes  No
22. Does it have training/trainer's manual online?  Yes  No
23. Are ongoing projects in the department listed?  Yes  No

### External Resources

24. Are there any reference tools listed?  Yes  No
25. Any links to outside technical services or catalog departments' home pages?  Yes  No
26. Links to professional journals/literature?  Yes  No
27. Links to professional organizations/associations?  Yes  No
28. Links to electronic discussion lists?  Yes  No

# Notes on Operations

## Cataloging and Digitizing Ephemera

### One Team's Experience with Pennsylvania German Broadsides and Fraktur

**Ann Copeland, Susan Hamburger, John Hamilton, and Kenneth J. Robinson**

*The growing interest in ephemera collections within libraries will necessitate the bibliographic control of materials that do not easily fall into traditional categories. This paper discusses the many challenges confronting catalogers when approaching a mixed collection of unique materials of an ephemeral nature. Based on their experience cataloging a collection of Pennsylvania German broadsides and Fraktur at the Pennsylvania State University, the authors describe the process of deciphering handwriting, preserving genealogical information, deciding on cataloging approaches at the format and field level, and furthering access to the materials through digitization and the Encoded Archival Description finding aid. Observations are made on expanding the skills of traditional book catalogers to include manuscript cataloging, and on project management.*

Ephemera and ephemera collections well deserve the attention they are receiving of late. Academic librarians concerned with exposing hidden collections have acknowledged the value of ephemera.<sup>1</sup> The American Antiquarian Society has pointed to ephemera among its primary resources that allow scholars to study print culture from its earliest beginnings in North America.<sup>2</sup> The Library of Congress' digital collection, "An American Time Capsule, Three Centuries of Broadsides and Other Printed Ephemera," celebrates "the everyday activities of ordinary people who participated in the events of nation-building" captured within the artifacts.<sup>3</sup> The September 2005 symposium, "Ephemera Across the Atlantic: Popular Print Culture in Two Worlds," sponsored by the Library Company of Philadelphia and Winterthur Museum and Country Estate, focused on the wealth and variety of genres in public and private hands—from early printed broadsides to contemporary culi-

nary artifacts, from the sacred to the secular. Several monographs and two major exhibitions on the Pennsylvania German broadside, and the launch of a project at the University of Göttingen to record all broadsides printed in North America in the German language between 1700 and 1830, reveal a groundswell of current activity regarding ephemera.<sup>4</sup>

The recent experience of the Pennsylvania State University Libraries Special Collections Cataloging Team in cataloging a collection of ephemera, consisting of Pennsylvania German broadsides and Fraktur, was timely in addressing access to such materials. The term Fraktur, which originally described a type of German printing similar to old English Gothic, today refers generically to a form of Pennsylvania German folk art, in print or manuscript, that is embellished with illustrations of birds, hearts, flowers, and angels to document births and baptisms, marriages, and other occasions. When cataloging these items, the

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intermingling of folk art with printing, handwriting, and graphics raised many questions. With genealogical material calling out to be preserved, how much should be recorded? Given the hand-painted folk art and the graphic dimensions of the individual pieces, what set of cataloging rules—graphic, manuscript, or monographic—should be used? With clusters of like items, how should one decide between a collection-level versus item-level approach? What kinds of metadata might be suitable for a digital presentation of such materials?

This paper discusses the various challenges of cataloging mixed collections of ephemera and makes a case for ensuring access to ephemera through Machine Readable Cataloging (MARC), Encoded Archival Description (EAD) finding aids, and, ideally, digitization. It also describes the way one cataloging team worked through the issues to solve problems, document decisions, and create a metadata-rich digital project.

## Literature Review

In a theme issue of *Rare Book and Manuscript Librarianship* on “Descriptive Cataloging of 19th Century Imprints for Special Collections,” Zeitz suggested that the “bibliographic control of ephemera is now in its infancy, with the exception of the major ephemeral genres: broadsides and the graphic arts (woodcuts, engravings, drawings and lithographs), book-like pamphlets, and major manuscript materials such as letters, diaries, journals, and ledgers.”<sup>5</sup> He advocated a hybrid cataloging practice, combining the most appropriate rules from as many codes as necessary to truly bring ephemeral materials into the research domain: “ephemeral materials have been under-utilized as a research source probably because of the difficulty in accessing them.”<sup>6</sup>

Zeitz suggested that if catalogers keep in mind the many ways that ephemeral materials may be researched (subject, corporate name, printer, type of illustration, etc.), they will create a record that will be accessible to the widest audience. The examples in his article are printed ephemera (such as menus, tickets, letterheads, calling cards, advertisements), but he noted that there are at least 150 genres of ephemera. Zeitz discussed the construction of the major fields in the cataloging record and advocated liberal use of genre terms, relator codes, notes, subject access, tracing of names, tracing of first lines of verses, captions, and mottoes. He concluded that, regarding access, more is better than less, provided it makes sense within the collection and the institution.

In the same issue, O’Keefe’s article, “Cataloging 19th Century Single-Sheet Publications,” described the American Antiquarian Society’s (AAS) cataloging program for broadsides.<sup>7</sup> Recognizing that broadsides “document the history of the nation and its communities, and do so in a manner more timely and with greater passion than any other printed sources,” the AAS began full cataloging of its collection of 20,000 items in 1980 to preserve them from unnecessary handling.<sup>8</sup> The Society catalogs single-sheet publications according to AACR2 and *Descriptive Cataloging of Rare Books* (DCRB) rules, with extensive subject headings and access points for provenance, genre, and so on.<sup>9</sup>

More recently, Hadley spoke to the issue of “Access and Description of Visual Ephemera,” at a Society of American Archivist’s conference session on the topic of ephemera.<sup>10</sup> She suggested that there is really no right way to deal with visual ephemera, and that approaches will vary according to institution and research needs. Her discussion, from an archivist’s point of view, described the way different research needs can be served by highlighting various elements of visual

ephemera; she concluded, as Zeitz did, that the most successful strategies for description and access are those that anticipate the likely use of materials.

Numerous published book-length guides describe private and public Fraktur collections with images, text, and a listing of holdings, such as those from the Library of Congress, Free Library of Philadelphia, Franklin and Marshall College, and the Schwenkfelder Library.<sup>11</sup> These are important reference materials, but do not specifically address the cataloging of Fraktur.

The literature on the cataloging of ephemera is limited, as Zeitz explained, because bibliographic control of ephemera is in its infancy. He suggested that, given the marginal status of ephemera until lately, the cost of cataloging, book arrears, and the lack of a tradition for cataloging ephemera has meant that “there are few or no standards and little established practice. Few librarians or libraries want to be pioneers in establishing a cataloging policy for ephemera . . .”<sup>12</sup> Because nothing has been written specifically on the cataloging of Fraktur, the authors decided to use the Penn State project as an opportunity to establish a cataloging policy. The authors hope that the decisions reached as part of this project and the process followed will be useful for other practitioners as the interest in ephemera grows.

## Overview of the Cataloging Project

Sandra Stelts, curator of rare books and manuscripts at the Pennsylvania State University Libraries, first organized the library’s collections of Pennsylvania German broadsides and Fraktur in 2001, in anticipation of a visit from the late Carola Wessel of the University of Göttingen. As mentioned earlier, Göttingen is conducting a nationwide survey of all German lan-

guage broadsides published in North America from 1700 to 1830, with the goal of developing a comprehensive bibliography and digital project to be shared via the Internet. The current project is under the supervision of Reimer C. Eck of the Göttingen State and University Library; the work has the proposed title of *Bibliography and Edition of Broadsides Printed in North America in the German Language, 1700–1830*.<sup>13</sup>

During the summer of 2003, Anthony Tedeschi, a library intern, began the initial processing of the collection. His translation of German into English and his descriptions of the items provided the basis for the project's cataloging records. Members of the Special Collections Cataloging Team, who became the project team, consisted of four catalogers, each with his or her own approach to cataloging. The three book catalogers (Ann Copeland, John Hamilton, and Ken Robinson) were familiar with transcription, bracketing supplied titles, and recording dimensions. The manuscripts cataloging librarian, Susan Hamburger, experienced in writing descriptive summary notes, cataloging at the collection level, and constructing unbracketed titles for manuscript records, had much to teach the rest of the team.

The project began slowly in summer 2003, and gained speed once the collection was accepted as a digital project in January 2004. The Pennsylvania German broadsides and Fraktur fit thematically into a growing body of digitized resources on Pennsylvania history. While additions to the collection and the digital site are ongoing, the first 160 records (most of the project) were completed by June 2004, with the digital site, Pennsylvania German Broadsides and Fraktur ([www.libraries.psu.edu/speccolls/rbm/fraktur/index.html](http://www.libraries.psu.edu/speccolls/rbm/fraktur/index.html)), going live in October 2004.

### Special Challenges

The collection of Fraktur material owned by the Special Collections Library at Penn State presented interesting and memorable cataloging dilemmas. Creating cohesive and coherent cataloging records for a miscellany consisting of printed broadsides, graphic materials, single-item manuscripts, and manuscript collections required more than accurately following established rules. It required a series of informed decisions, developed and shared by all participants. Employing multiple sets of cataloging rules, historical interpretation of the material, and some specialized reference and research materials, cataloging this varied collection proved to be complex yet exhilarating.

The team began the project with a box of materials (organized by size of item) from one of three collections (the Ammon Stapleton Collection, the Allison-Shelley Collection, and the general rare book and manuscripts collection) containing Pennsylvania German broadsides and Fraktur. Each person cataloged items in turn until all items in the box were finished. Because no inventory across the three collections existed, no one realized that similar materials existed throughout. For example, identical printed birth certificates by G. S. Peters, H. Sebald, and Johann Ritter were cataloged by different team members. After cataloging about fifty items, team members realized they needed to be more consistent in their approach and began to meet as a group regularly. This necessitated, in many cases, looking back through those early records and making sure the records agreed with the subsequent cataloging decisions. Such collaboration provided both greater access and more consistent access to the collection.

From the experience, the team learned that when taking on such a project, a preliminary inventory

should be made to discover duplicates and like items. Additional lessons learned from the project include the need to discuss cataloging interpretations among team members, meet frequently to share newly identified issues, and catalog a few pieces before getting back together again to determine a consistent and mutually agreed on approach.

One significant decision was to preserve all relevant data and record it as consistently as possible. The *Taufschein* (birth and baptismal certificates) have been cataloged by other institutions as broadsides, emphasizing the printer and publisher rather than the family that is celebrated by the handwriting on the form. These data often include name of child, birth and baptismal dates, geographic location, father's name, mother's maiden name, and sometimes the pastor's and witnesses' names. Cataloging several *Taufschein* and then conferring allowed the team members to arrive at a record structure that contained both manuscript and printed information (discussed later in this paper). Sharing their knowledge and various perspectives, team members created an inclusive record structure that could be used consistently for optimal access. Documenting these decisions was also crucial, as similar items continued to appear at random among the three collections.

Another challenge was learning about the various subgenre of Fraktur. By reading and comparing notes, looking at guides to other collections, and locating reference materials, the team members gained confidence when cataloging these unique artifacts. Items included writing specimens (*Vorschriften*) given to pupils by their teachers as a reward of merit; religious texts, hymns, or house blessings (*Haus Segen*) in the form of bookmarks and paper cut-outs; and spiritual mazes (*Irrgarten*). Understanding the subcategories within the Fraktur collec-

tions ensured the appropriate use of descriptive notes and genre terms and their consistent application across the collections.

### Deciphering Pennsylvania German Printing and Handwriting

One of the biggest challenges in working with this collection was reading the Pennsylvania German printing and handwriting, commonly called Fraktur and Frakturschrift, respectively. This style of typeface and handwriting evolved from the Gothic script first developed in ninth century German-speaking Europe.<sup>14</sup> The final form of Fraktur was standardized by 1513 and prevailed in Germany until 1941, when it was superseded by the leaner Roman typeface seen today.<sup>15</sup> Frakturschrift is often referred to as Sütterlinschrift, a script created by Berlin graphic artist Ludwig Sütterlin (1865–1917), and taught in German schools from 1915 to 1941.<sup>16</sup> They are very similar in appearance. German immigrants brought Fraktur and Frakturschrift to America in the eighteenth and nineteenth centuries. The Pennsylvania Germans used this style from about 1740 until the first quarter of the twentieth century. Fraktur is being used today, though in smaller numbers, and primarily in English.<sup>17</sup>

One of the difficulties when reading Fraktur and Frakturschrift is confusing letters with the more familiar Roman typeface and script. To assist in deciphering these letters correctly, two sources were invaluable: Mashey's *A Guide to Olde German Handwriting of the Mid-1800's* and Bentz' *If I Can You Can Decipher Germanic Records*.<sup>18</sup> Both guides provide numerous clear examples for each letter. The online handwriting guide published by the Family History Library provides a useful table comparing the Roman type with its corresponding German type and script.<sup>19</sup> Even with the assistance of guides, there may still be difficulty determining what was written or printed, as many letters look alike

SCRIPT		PRINTED			
Roman type	Sütterlinschrift	Roman type	Fraktur type	Roman type	Fraktur type
e, n, u	н, и, ъ	A, U	ⱱ, Ɱ	s, f	ſ, ƒ
s, h, f, j	ſ, h, f, j	B, V, β	Ɱ, Ɱ, Ɱ	b, n, v	Ɱ, n, v
r, v	Ɱ, ʋ	C, E	Ɱ, Ɱ	k, t	Ɱ, t
g, p, q	Ɱ, p, q	G, S	Ɱ, Ɱ	r, x	Ɱ, x
B, C, L	Ɱ, L, L	K, N, R	Ɱ, Ɱ, Ɱ	v, y	Ɱ, y
		I, J	Ɱ, Ɱ	i, j	Ɱ, j

Figure 1. Easily confused letters

and may be easily confused with each other. These are shown in figure 1. The letters “I” and “J” are particularly difficult, and consulting a German language dictionary is prudent when in doubt.<sup>20</sup>

In addition, when used together, the small angular letters of the handwriting (i, c, n, and m) become quite difficult to separate. Mashey gives helpful suggestions, such as a dot above a letter would indicate an “i,” and the letter “c” is usually followed by an “h” or a “k.” To determine the difference between “m” and “n,” she recommends counting the peaks. Some letters give the appearance of two separate letters, when they are in fact one. These include A, a, G, g, Q, q, and y. The team members found identifying the more easily recognizable letters first (instead of going directly from left to right) to be helpful. This gave clues to the Roman counterparts for the more difficult letters. The Fraktur typeface also has ligatures—multiple letters printed as one letter. The early designers of the Gothic typeface used one type piece to print both letters. The most common ligatures are shown in figure 2.

Some handwriting examples are difficult to decipher due to sloppy handwriting or letters that have faded over time. A magnifying glass can be useful. A German language dictionary or a German language speaker may help to ascertain the remaining portion of a word that is only partially

ck - ck	ch - ch
tz - tz	ss - ss

Figure 2. Fraktur ligatures

recognizable. For birth and baptismal certificates, consulting a detailed map or searching the United States Geological Survey Geographic Names Information System online database assisted in identifying place names.<sup>21</sup> Where a word is truly indecipherable, one should make an educated guess and apply a guideline found in Hensen's *Archives, Personal Papers, and Manuscripts* that recommends supplying a question mark in brackets.<sup>22</sup> Often variant spellings, missing umlauts, missing punctuation, uncapitalized nouns, and letters not written in a standard form, and occasionally some mixing of Fraktur and Roman script, are present within the same document. The process of deciphering was initially tedious, but with experience the team became more efficient. Keeping the comparison chart (figure 3) close at hand was helpful.

### Creating Collection-Level Records

Given the growing interest in ephemera, the promise of Göttingen's digital project, and the uniqueness and research value of the collection, team members chose to catalog the

Pennsylvania German broadsides and Fraktur individually. This would bring out the variety and depth of the collection, provide consistent access to the materials as a collection, and accurately describe Penn State's holdings to potential users elsewhere via Penn State's online catalog and records in OCLC's WorldCat.

In two cases, however, collection-level records for small clusters of material were more appropriate. In both cases, the sum of the parts was more important intellectually than the individual items. The collection includes twelve issues of 6 different German American newspapers. Team members did not want to mislead anyone about Penn State's holdings by cataloging each title as a serial, nor did they have sufficient information to do so; thus, a collection-level record was the best solution.

Team members also chose to assemble a small cluster of 24 disparate pieces of ephemera together into one group with the collective title "Pennsylvania German bookmarks, maxims, fragments, cut-paper work and pin-prick work, 1753-1816." The collection consists of printed and manuscript poems, sentiments, mottoes, bookmarks, drawings, and symbols, all on small slips of paper, the smallest measuring 3 x 8 cm and the largest 18 x 11 cm. The folk art drawings are colorful. When assessing the pieces individually, the team members were confronted by questions such as: How does one catalog a snowflake? (See figures 4 and 5.) Taken together, the items are a link to the idle pastimes—drawings and doodles—as well as treasured sentiments of a people.

**Format Decisions**

In general terms, the individual Fraktur materials comprise three primary categories—monographic broadsides, graphic materials, and manuscripts. Within such broad categories, some materials qualify as multiple formats. The Taufschein are simultaneously

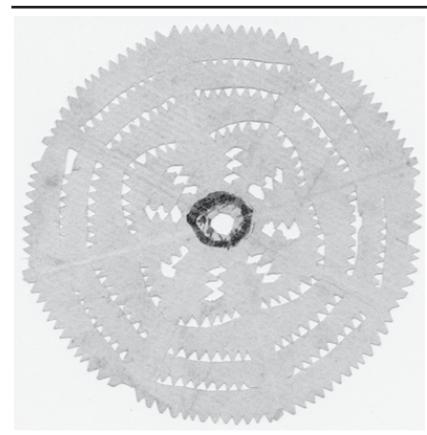
Roman	Fraktur	Sütterlin	Roman	Fraktur	Sütterlin
A a	A a	A a	N n	N n	N n
B b	B b	B b	O o	O o	O o
C c	C c	C c	P p	P p	P p
D d	D d	D d	Q q	Q q	Q q
E e	E e	E e	R r	R r	R r
F f	F f	F f	S s	S s (or S*)	S s (or S*)
G g	G g	G g	T t	T t	T t
H h	H h	H h	U u	U u	U u
I i	I i	I i	V v	V v	V v
J j	J j	J j	W w	W w	W w
K k	K k	K k	X x	X x	X x
L l	L l	L l	Y y	Y y	Y y
M m	M m	M m	Z z	Z z	Z z

\* Only when "s" occurs at the end of a word.

**Figure 3.** Roman, Fraktur, and Sütterlin letters

broadsides, graphic materials, and manuscript items. Typically, catalogers will apply the Anglo-American Cataloguing Rules and the Library of Congress Rule Interpretations (LCRIs) to monographic items such as printed broadsides, consult *Describing Archives: A Content Standard* (DACS) for guidance on manuscript items, and refer to *Graphic Materials: Rules for Describing Original Items and Historical Collections* for pieces that are clearly graphic.<sup>23</sup> For the birth certificates, the team members developed the idea of cataloging them as hybrid records, using the manuscript format to record all the unique genealogical information, supplemented by notes to record the displaced monographic elements, such as publication data.

Are the Adam und Eva broadsides in figures 6 and 7 textual or graphic? Team members decide to catalog them as text because the images, although relatively large in proportion to the text, do not stand on their own and the textual portions are crucial to the documents in conveying the meaning. This is one



**Figure 4.** Cut-paper work

example of the kind of evaluation required before cataloging many of the pieces in the collection.

Sometimes team members were able to use an existing catalog record prepared by another institution for the document in hand. Occasionally they recognized that, while a particular record matched the item in hand, it had been cataloged using the wrong format. In these cases, team members created a new record to describe

the item in the appropriate MARC format.

### MARC Cataloging Decisions

The key data elements required to describe and access these materials were the same fields common to other online cataloging records—Main Entry, Title and Variant Titles, Publication Data (with particular attention to the date of publication), Physical Description, Notes (specifically Summary and Citation/Reference notes), Subjects and Genre terms, and Added Entries. The Host Item Entry field was also added to link individual records to each of their respective home collections (Ammon Stapleton and Allison-Shelley).

#### Main Entry (1XX)

The main entry was formulated based on rules applicable to the type of material—AACR2, *Graphic Materials*, or DACS. For the Fraktur, the main entry could be an artist or an individual author. A Fraktur artist responsible for creating a certificate, for instance, would qualify for main entry status. Added entries for the family and individuals documented on the certificate were included in 6XX or 7XX fields. In general, ephemeral genealogical material does not lend itself to authorial main entry; the team members chose a title main entry for these materials.

For single sheets, the entire item is to be considered the chief source, and the main entry could conceivably be found only by reading the piece. Some broadside poems or songs had a substantial publishing history and the main entry could be determined by research, even though the author was not mentioned on the item.

#### Title and Variant Titles (245 and 246)

In many cases, the primary title was clearly defined, and could be constructed using fundamental AACR2

<b>Title:</b>	<b>Pennsylvania German bookmarks, maxims, fragments, cut-paper work, and pin-prick work, 1753–1816.</b>
<b>Author:</b>	
<b>Other Title:</b>	
<b>Publication Information:</b>	
<b>Physical Description:</b>	24 items.
<b>Notes:</b>	In Rare Books and Manuscripts, University Libraries, Pennsylvania State University, University Park, Pa. (#F160.G3P463/Box 1 Item 005/Vault).
<b>Summary:</b>	The collection consists of 24 printed and manuscript poems, sentiments, mottoes, bookmarks, drawings and symbols, all on small slips of paper, the smallest measuring 3 × 8 cm. and the largest 18 × 11 cm. The folk art drawings are very colorful. Some of the calligraphy is in a fraktur style hand.
<b>Acquisition Source:</b>	Purchased.
<b>Finding Aid:</b>	Online finding aid for all Penn State Pennsylvania German broadsides and Frakturs available at <a href="http://www.libraries.psu.edu/speccolls/FindingAids/fraktur.frame.html">http://www.libraries.psu.edu/speccolls/FindingAids/fraktur.frame.html</a>
<b>Subject:</b>	
<b>Genre:</b>	Broadsides; Penmanship, German; Bookmarks; Cut-paper work.
<b>Contributors:</b>	
<b>Collection:</b>	Pennsylvania German broadsides and Fraktur, 1750–1979
<b>Permitted Uses:</b>	This image is posted publicly for non-profit educational uses, excluding printed publication. Other uses are not permitted. For details please see: <a href="http://alias.libraries.psu.edu/vius/copyright/publicrightssc.htm">http://alias.libraries.psu.edu/vius/copyright/publicrightssc.htm</a>
<b>Image Size:</b>	400 × 393
<b>File Format:</b>	JPEG

Figure 5. Description for cut-paper work

principles. Some broadside titles are of impressive length, and lend themselves to transcribing large quantities of text, but many presented an uncomplicated title that was easy to identify and record. For example:

Doctor Wilhelm Stoy's  
gewisses Mittel gegen den  
Biss toller Hunde.

Carding machine : the sub-  
scribers, living at the Fulling

mill, in Rockland town-  
ship, Berks County, having  
erected a new machine for  
carding wool, they invite  
all those, who wish to have  
their wool carded, to bring  
it there, and they hope to be  
able to give satisfaction to all  
those, who will honor them  
with their custom . . . .

This indenture made the  
twenty fifth day of January  
in the year of our Lord one  
thousand seven hundred  
and sixty three between  
Frederick Hummel of  
Derry Township County of  
Lancaster and Province of  
Pennsylvania Yeoman and  
Rosina his Wife of the one  
part, John Bowman of the  
same county on the other  
part.

For a significant percentage of the  
collection, however, the title element  
needed to be created, and in a consis-  
tent fashion throughout. Birth and bap-  
tismal certificates, for example, might  
be entirely original, or they could con-  
sist of one of the popular designed and  
printed forms with added handwritten  
information. While brackets are not  
required in manuscript cataloging, as  
all the title information is supplied  
by the cataloger, some printed forms  
with titles were transcribed and the  
additional handwritten data included  
within brackets. For those certificates  
without an explicit title, team mem-  
bers constructed one, recording the  
type of certificate(s) and the name of  
the individual or family recorded on  
the item:

Geburts und Taufschein [for  
Eva Isabella Richard, 1864  
Aug. 17-1864 Sept. 14]

Birth and baptismal cer-  
tificate for Mamie Emma  
Walter, 1886.

Variant Title entries were created  
for other data found on the item, such  
as first lines of poems or songs; because  
the pieces were largely created in the  
German language, numerous trans-  
lated titles needed to be included:

Playbill for Schiller's *Kabale  
und Liebe*  
First line: *Kabale und Liebe*

*Der Einzug Christi in  
Jerusalem.*  
First line: *O sehet Jesus ist zu  
uns vom Himmel kommen*

*Dieses Sing-Horen-Buchlein  
gehöret Johannes Wagner,  
1791.*  
Translated cover title: This  
booklet of songs belongs to  
Johannes Wagner

#### Place of Publication and Name of Publisher (260a and 260b)

The Fraktur collection contains a  
host of unpublished material, which  
resulted in few 260 fields. Even for  
published material (primarily broad-  
sides and printed birth and baptismal  
forms), publisher and printer infor-  
mation was often lacking. In these  
cases, research was needed to discover  
the printer. Fortunately, Penn State's  
library's book collection includes  
excellent reference sources, enabling  
team members to match graphic ele-  
ments from the item in hand with an  
array of illustrated examples, often  
identifying the particulars with amaz-  
ing accuracy—revealing the place and  
printer, and establishing the date that  
a specific design was used to within a  
short span of years:

Harrisburg: Gedrucht und  
zu haben bey G.S. Peters,  
[1830?]

Reading: printed by J. Ritter  
& Co., [1811]



Figure 6. Adam and Eva broadside  
(example A)



Figure 7. Adam and Eva broadside  
(example B)

In other cases, publication data  
was more problematic. Sometimes an  
approximate place of publication could  
be determined from similar material,  
or from clues in the piece; reference  
sources were quite helpful in suggest-  
ing when particular designs were used  
or when a certain publisher flourished.

At times, research, analysis, and inspiration could only achieve so much:

[Reading, Pa.: s.n., 18--]

[S.l.: s.n., 1750?]

Hybrid items, such as a printed birth certificate filled in with handwriting, were cataloged as single-item manuscripts. No 260 field was possible for such items. Printing information for the original form, when available, was recorded in a 500 note:

Printed for F. Krebs in  
Reading, Pa., ca. 1814.

#### **Date of Publication (245f and 260c)**

Dates are crucial to genealogical and other researchers, so team members sought the most accurate date possible for each item. The date was recorded in the 245 subfield f for single-item manuscripts; the entire range of inclusive dates was put into the subfield for collection-level records:

Johann Jacob Weyandt  
manuscript, Vorschrift, 1780  
March 13.

German American newspapers,  
1805-1908

The date of the printing goes in the 260 subfield c for published and visual material. Corresponding dates and types were supplied in the fixed fields:

[Reading?, Pa., ca. 1790?]

Dates, when not explicitly stated, could usually be determined from similar material or research sources. For some published material, the date of publication was easily available; for others, sources often suggested active dates for a publisher that helped estimate dates of publication. Internal evidence helped to approximate a date

of publication. This data was recorded in a General Note:

Date of publication from  
only date found in the text  
on p.[4].

Two other similar broadsides with different titles by Henrich Otto about Beppel's murder were supposedly printed in Philadelphia in 1785 according to Bristol and Shipton & Mooney.

For certain genealogical manuscripts, a profusion of data (such as records of multiple births, baptisms, marriages) produce a confusing array of dates. For example, a baptismal certificate might contain a birth date for the child, a wedding date for the parents, and perhaps a confirmation date for the child, recorded long after the event of the baptism. Thus the dates present on the item did not always reflect the date of the manuscript's creation. Team members elected to use the range of officially recorded dates provided in the form as the critical dates for the manuscript. They noted the date of the printed certificate, if available, in the summary note. Using the range of dates in the fixed fields forced team members to consider the certificate a collection in terms of the bibliographic level:

Geburts- und Taufschein for  
Däse Sell, 1859 Nov.

14-1860 May 6.

Summary: A birth/baptismal certificate for Däse Sell, daughter of Peter (the word Johannes is crossed out) and Anna Sell (née Hassler), born on Nov. 14, 1859 in Lower Heidelberg, Berks County, Pennsylvania and baptized May 6, 1860. The form was apparently filled out some years after the birth since the form was printed ca. 1862.

#### **Physical Description (300)**

Due, in part, to the presence of a 520 Summary Note in every manuscript record, the 300 Physical Description only needs to convey the number of pages or pieces, an identifying term, the presence and nature of any illustrations, and the dimensions of the piece. For collection-level records, the number of pieces was recorded as specified by DACS. Team members consistently recorded both the overall dimensions of the sheet and the printed portion, because variations in these dimensions were often critical for identifying editions or iterations:

1 broadside : ill. ; 25 × 17  
cm. on sheet 28 × 20 cm.

1 engraving : col. ill. ;  
19 × 23 cm., on sheet  
24 × 28 cm.

24 items.

#### **General Note (500)**

General Notes were created to record bibliographic details, identify holdings, and credit those sources that helped provide estimated dates. The notes, taken as a whole, provide an indication of the diverse and often eccentric topics relegated to such fields in general cataloging. The notes necessitated by the Fraktur materials were even more colorful, but otherwise conformed to AACR2 standards.

Title is in two columns with two biblical passages surrounded by a hand-colored heart decoration in between; at head of title are three hand-colored illustrations of angels.

To the tune of Dietrich  
Buxtehude's Mein Gemüth  
erfreuet sich.

Friedrich Krebs had ordered  
1000 birth/baptismal cer-

tificates in 1805 and another 500 in 1806. It is supposed that the certificates of both orders vary in the typesetting. It is not possible to decide which order this edition belongs to. --Cf. Stopp, K. Birth and baptismal certificates, 647.

### Citation/References Note (510)

The importance of the Citation Note became apparent early in the project as a place to acknowledge the reference and resource materials consulted in seeking to organize this collection. Consulting standard references in Fraktur research, as well as more generalized resource materials, led team members to the practice of citing these sources in the Citation/Reference Note field. Stopps' six-volume catalog of all known printing variants of the popular certificates, *The Printed Birth and Baptismal Certificates of the German Americans*, proved invaluable.<sup>24</sup> Lloyd's *Faith and Family: Pennsylvania German Heritage in York County Area Fraktur* helped the authors understand the illumination of various Fraktur types and the styles of the folk artists.<sup>25</sup> They formulated citations according to *Standard Citation Forms for Published Bibliographies and Catalogs Used in Rare Book Cataloging*.<sup>26</sup> Team members referenced the information from these sources, citing them in the 510 note:

Shaw & Shoemaker, 50603

Gravell & Miller. American watermarks, p. 181, 243-244

Hildeburn, C.R.  
Pennsylvania, 2801

Shipton & Mooney, 43893

In some cases, the most ardent research yielded nothing more than

tired eyes and a stack of sources. When research was justified but unrewarded, negative results might be included in a standard 500 note:

Not in Evans, Sabin, NUC pre-1956, Bötte & Tannhof.

Bristol B7395 and Shipton & Mooney 45894 list a book (8 p.; 8 vo.) with same title published by Johannes Thaten in 1790; Bötte & Tannhof attribute this same book to the press of Johann Albrecht und Comp.; no mention of a broadside in any of these sources.

Not in Stopp, K. Birth and baptismal certificates, but very similar in design to others by Barton & Jungmann for the 1790-1793 period.

### Summary Note (520)

Team members included a Summary Note for all materials regardless of format. Because researchers are the projected audience for the Fraktur materials, a fairly high level of detail was provided in the Summary Note, which was constructed to highlight the textual contents, as well as to describe decorations. Information detailing the size and scope of the item and other physical details were included, such as the number of lines, columns, or stanzas. Team members made every effort to describe similar materials consistently. For example, printed forms that were filled in were described with the handwritten parts enclosed in square brackets:

Birth and baptismal certificate published by Schæfer & Koradi, ca. 1877, featuring central form within historiated border conveying Biblical scenes and themes; printed in blue with pale green

background. The form reads: This certifies that [Sanly Luke Morris Rotharmel] a child of [Jeremiah] and his wife [Meary] was born on the [twenty-third] day of [December] in the year of our Lord 18[98], in [Berks] County, [Pa] and was baptised on the [5th] day of [March] 18[99] by [A.K. Zimmerman]. Sponsors: [Mr. + Mrs. Rotharmel].

A song describing the 1809 hanging of Susanna Cox for the murder of her newborn child in Reading, Pennsylvania. Often attributed to Johann Gombert, a Bern Township schoolmaster present at the event, and likely issued soon afterward. In 32 numbered stanzas of four lines each, divided into three columns, within ornamental border around all and decorative rule between columns.

A variation of the Letter from Heaven, first published in Magdeburg in 1783 and attributed to Jesus. The letter describes how to live a good Christian life, and promises to act as a charm against certain disasters, and as a general good-luck charm. Printed in two columns beneath title header, within ornamental border of blue and gold; some text also printed in blue or gold. Includes several symbols, including two angels in the act of delivering the letter, two eye-with-scales images flanking the letter header, and an image of Christ in Heaven.

### Subjects and Form/ Genre Terms (6XX)

Much of the subject analysis for the Fraktur collection could be considered typical. The variety of materials represented in the collection covered a broad range of subject areas—art, religion, genealogy, local history, German language aids, medicine, and so on. The list of subject headings below, culled at random from records in the collection, may give some indication of the diversity possible in a synthetic collection pressed together from loosely-affiliated pieces:

Bible -- Examinations, questions, etc.

Blood.

Bites and stings -- Treatment -- Pennsylvania.

Climatic changes -- Effect of solar activity on -- Pennsylvania -- Poetry.

Fall of man -- Pictorial works.

Harvesting -- Poetry.

Helminthiasis in children -- Pennsylvania -- Treatment.

Honey -- Therapeutic use.

Infanticide -- Pennsylvania -- Reading -- Poetry.

Miracles -- Poetry.

Murder -- Pennsylvania -- Poetry.

Napoleon I, Emperor of the French, 1769-1821 -- Poetry.

Penmanship, German -- Specimens.

Picnicking -- Pennsylvania -- Grange.

Rabies -- Popular works.

Uxoricide -- Maryland -- Fredericktown -- Poetry.

In addition to subject headings, team members applied form/genre terms in field 655, using a variety of thesauri, including the *Thesaurus for Graphic Materials: TGM II: Genre and Physical Characteristics Terms*, *Thesaurus for Graphic Materials: TGM I: Subjects, the Art & Architecture Thesaurus*, and *Rare Books Genre Terms Thesaurus*.<sup>27</sup> Each thesaurus has unique strengths in terms of established headings, and team members determined that applying terms as accurately as possible would provide the greatest benefit to users. They assigned subject headings to reflect the content of the work in hand and form/genre terms to represent the type of item.

For birth and baptismal certificates, the goal was to preserve all genealogical information. To that end the following structure was established:

600 30 [Family name]

600 10 [Child's name],  
[Date] -- Birth

600 10 [Father's name]

600 10 [Mother's name]

650 0 Baptismal certificates  
-- Pennsylvania -- [Place] --  
Specimens

650 0 Birth certificates  
-- Pennsylvania -- [Place] --  
Specimens

655 7 Baptismal certificates  
-- Pennsylvania -- [Place]. aat

655 7 Birth certificates --  
Pennsylvania -- [Place]. aat

655 7 Broadsides. aat [when printed]

655 7 Frakturs (document)  
aat [when written in Fraktur style]

When a family name had not already been established, team members chose the form of the name on the piece for the 600 34 field, with the second indicator designating local use.

### Added Entries (7XX)

Creating added entries for people and places discussed in the works was essential to emphasize the local aspects that help make this collection unique. Appropriate entries might include a printer or artist; in the case of Fraktur bookplates, team members provided an added entry and a relator term for the previous owner of the book:

245 Bookplate for Maria  
Bruchin, 1775.

700 Bruchin, Maria, b. 1758,  
former owner.

Team members chose to make liberal use of added entries, including the names of the many artists, printers, and other contributors represented by the collection. Using relator terms in the subfield e helped to establish the relationship between the entry and the item being cataloged:

Zentler, Conrad, 1771?-1848,  
printer.

Boyer, Solomon, paper-  
maker.

Reiche, J. F., engraver.

Mifflin, Thomas, 1744-1800,  
recipient.

### Host Item Entry (773)

One of the most important decisions made was to collocate the Fraktur

material to aid online searching. Team members constructed a general 773, Host Item Entry, for all items to indicate their affiliation with the Pennsylvania German broadsides and Fraktur collection. Additionally, they used a 773 to affiliate individual materials within the Ammon Stapleton Collection and the Allison-Shelley Collection:

Pennsylvania German broadsides, Fraktur, and newspapers, 1780-1908  
[for the Ammon Stapleton Collection]

Pennsylvania German broadsides and Fraktur, 1772-1866  
[for the Allison-Shelley Collection]

Pennsylvania German broadsides and Fraktur, 1750-1979  
[for Fraktur in the general, unnamed collection]

Using the 773 in this way aids retrieval by grouping collections for patrons and public services representatives. It also allows searching by donor collection, which is useful when showing a donor the additions to the collection via the online catalog.

#### **Electronic Location and Access (856)**

In addition to individual catalog records, an EAD finding aid contextualizes the entire collection: Guide to the Pennsylvania German Broadsides and Fraktur Collection ([www.lias.psu.edu/speccolls/FindingAids/fraktur.frame.html](http://www.lias.psu.edu/speccolls/FindingAids/fraktur.frame.html)). The finding aid collocates items by form and genre in series and subseries, provides the call number, box and folder number of each item, and indicates the named collection to which each piece belongs (Ammon Stapleton or Allison-Shelley). To facilitate leading a user to the finding aid, a hyperlink was added to every catalog record.

### **The Digitization Project**

Digitizing images provides access to and sharing of resources via the Internet. Where fragile artifacts and rare materials are concerned, an additional benefit to such efforts accrues. Browsing images via thumbnails in lieu of handling items helps to preserve the originals. The ability to connect a digital image to a catalog record is further compelling. As Zeitz pointed out, "With the advent of imaging technology, we are in a position to begin cataloging collections of ephemera with the secure knowledge that cataloging records can be linked with images of the item in a way which will allow precise, quick retrieval."<sup>28</sup>

Ephemera, often defined as "minor transient objects of everyday life," are by nature impermanent.<sup>29</sup> Broadsides were "passed out as handbills or posted for temporary public viewing, then quickly discarded. A few were rolled, folded, or pasted in a drawer or chest. Others were tucked in books and forgotten."<sup>30</sup> Fraktur, with its highly individualized folk art illustration, was not designed to be framed or intended for public display. These were personal documents, certificates of merit, bookplates within books, family registers pasted into a Bible. Their fragile nature is of concern. Many of the broadsides in the collection have been folded, are faded, and show signs of wear and water damage. Digitization can protect against additional damage caused by excessive handling.

In creating the digital site, the question of metadata had to be solved. Because several of the team members participated in proposing the digital project to the preservation department, they were able to influence the metadata decisions. Brief descriptions are often created for digital initiatives and have the advantage of not cluttering the screen with too much information. Brevity in description is compensated by the ability to browse

among versions, quickly compare, and visually locate a particular symbol or type layout from a page of thumbnails. The opportunity to make a visual identification by those who will "know it when they see it" is a bonus for certain researchers who may otherwise wonder if the cataloger correctly described the artifact; the immediate visual recognition of a certain heart or angel can signify a printer or a style. The image alone would suffice for many Fraktur scholars.

When it was time to decide how to construct the metadata for the digital broadsides and Fraktur Web site, team members used the same reasoning that led to full item-level cataloging. Such unique items should have detailed descriptions so that users could search by personal and family names, printers, publishers, subjects, and genre, and know the physical dimensions of the original artifact. The initial efforts to fully catalog each item made the transition to the online environment fairly easy from the standpoint of metadata. The full MARC record was used in the digital collection. Because of the software used, the fields display as Dublin Core Elements, with the mapping from MARC to Dublin Core behind the scenes.

Using CONTENTdm Digital Collection Management Software for the collection presentation enables searching a term in any of the fields. The software also allows users to search on a list of browse categories based on a predetermined list or a controlled vocabulary, presented to the user as a drop-down menu. The team chose some of the most common form/genre terms used in the 655 field of MARC to populate the drop-down list. Figure 8 presents a sample screen, displaying the dropdown menu.

Users are able to view thumbnails of every image in the collection that results from a search. Clicking on an individual image or viewing all of the materials of one type (birth certificates, for example) allows vari-

Entire Collection
Advertisements
Ballads
Baptismal certificates
Bible stories
Birth certificates
Bookmarks
Bookplates (provenance)
Broadsides
Certificates
Confirmation records
Cut-paper work
Devotional poetry
Engravings
Fraktur (documents)
Hymns
Letterpress works
Lithographs
Manuscripts
Newspapers
Penmanship, German
Petitions
Playbills
Poems
Political campaigns
Portraits
Posters
Proclamations
Relief prints
Songbooks
Songs
Woodcuts

Figure 8. Drop-down list of genre terms

ous approaches to learning about the Fraktur through the digital collection. To direct a user to a description that would contextualize the larger collection, the individual metadata description for each image has a link to the EAD finding aid. Conversely, the EAD finding aid directs the user to the digital site.

## Conclusion

The Penn State Special Collections Cataloging Team has been fortunate in having the opportunity to catalog an ephemeral collection of Pennsylvania German broadsides and Fraktur.

Having little guidance from the literature when cataloging the Fraktur, the team had to devise a structure for preserving manuscript information for genealogical researchers, printing details for historians, and describing folk art decoration, all within one MARC record. The structure also includes ample tracings for various kinds of names, genre terms for format, a host-item entry to distinguish discrete collections within a larger collection, and a link to the larger EAD finding aid for context.

The various challenges presented in cataloging these materials required cooperation, imagination, and some innovative decisions. Bringing together the perspectives of those on the team and conferring throughout the project was not only enjoyable but also resulted in several positive outcomes. A researcher can now gain access to the materials through the full MARC records in the library's catalog and, by extension, in shared bibliographic databases, through an extensive explanatory EAD finding aid, and within a digital collection of high-quality scanned images.

The authors hope that the team's positive experience will serve as a model for other institutions contemplating providing access to similar collections of mixed ephemera. As libraries begin to realize the research value of their ephemeral collections, this project may provide encouragement as well as offer practical solutions for making these interesting and useful materials available.

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# Notes on Operations

## The Condition of Our “Hidden” Rare Book Collections

### A Conservation Survey at the University of Illinois at Urbana-Champaign

Jennifer Hain Teper and Sarah M. Erikson

*In response to the Association of Research Libraries’ Special Collections Task Force’s interest in “hidden” special collection materials, the University of Illinois at Urbana-Champaign’s Conservation Unit undertook a conservation needs survey of the Rare Book and Special Collections Library’s backlog of uncataloged rare book materials. The survey evaluated the binding structure; physical, biological, and chemical damage; and unique features of more than 4,000 randomly sampled pieces from the collection. The information gathered would aid in planning for the integration of immediate preservation actions with future cataloging projects and to better direct future conservation efforts. This paper details the development of the survey, interprets the results, and suggests methodologies for assessing other rare collections as well as approaches to integrating the identified immediate preservation needs with cataloging and processing projects.*

Rare book collections in major research libraries have been perceived to hold a number of uncataloged and thus inaccessible items. In 2001, the Association of Research Libraries (ARL) formally acknowledged the need to address the problem of backlogs, and its Special Collections Task Force began exploring the challenge of enumerating the dimensions of the problem and providing access to uncataloged and unprocessed archival, special collections, and rare book materials.<sup>1</sup> The task force acknowledged that these hidden collections are pervasive in research libraries across the nation, and pose significant cataloging, storage, and preservation or conservation challenges (or both) to the libraries that hold them. In September 2003, ARL hosted the Exposing Hidden Collections Working Conference, where attendees were encouraged to outline the problems and potential strategies and solutions to this extensive dilemma.<sup>2</sup> At its close, the conference highlighted several plans of action, including support for “inter-institutional strategies to expand

access to hidden collections including blending arrears reduction efforts with preservation and retrospective conversion approaches, leveraging digitization efforts, and the sharing of expertise across and between libraries and archives.”<sup>3</sup> This study provides one perspective for evaluating these hidden collections and sets a standard for other libraries to begin the assessment of their own hidden collections.

The Conservation Unit at the University of Illinois at Urbana-Champaign (UIUC) began its condition and needs analysis of the library’s hidden collections in February 2003. This survey was undertaken to help determine how preservation efforts could be integrated with future cataloging projects and to begin a dialog with the curators about prioritizing future conservation treatments. The Rare Book and Special Collections Library (RBSCCL) holds an estimated 80,000 uncataloged items. Of these, an estimated 20,000 pieces are printed, bound materials from the sixteenth and seventeenth centuries. To narrow the scope of the project, the research-

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ers selected these 20,000 uncataloged rare book materials as the focus of the project, though this collection is not as hidden as some other collections identified by ARL. All items do have author and title access through a card file, and English publications also are partially represented in the *Short-title Catalogue of Books Printed in England, Scotland, Ireland, Wales, and British America, and of English Books Printed in Other Countries, 1641–1700* and *English Short Title Catalogue: 1473–1800* (ESTC).<sup>4</sup>

This collection contains materials in a variety of conditions, many of which were acquired by RBSC in disrepair. Sample surveys are not commonly performed on rare book collections due to the highly variable bindings and physical condition of the materials. However, because of the collection size, the timeliness of the library's needs in quantifying its hidden rare book holdings, and ARL's current interest in such collections, the conservation librarian proposed a survey that would generate more generalized answers to questions on the material's preservation and conservation needs more rapidly than an item-level survey. This survey was planned to evaluate with a high degree of precision the condition and conservation needs of the 20,000 uncataloged pieces. Data generated from the findings then could be used for conservation planning and collection-wide preservation as well as to supply necessary information to RBSC as it moves towards improved access and cataloging of these materials. Additionally, the authors hypothesized that because many of the materials in uncataloged backlogs in other research collections are likely in similar condition (due to their frequent status as unprocessed gifts, to which little or no treatment has been given), the results of the survey also could be used to represent the needs of similar collections of unprocessed sixteenth- and seventeenth-century materials in other libraries.

## Literature Review

The typical preservation assessment focuses on collection-wide factors such as storage environment, policies, and procedures. By comparison, preservation and conservation surveys focus on a wide variety of factors that come into play when caring for collections. Surveys seek to answer questions related to the physical objects in the collection, either in a general or specific sense. Preservation professionals and curators then may use this information to better address the preservation needs of the collection by setting priorities, adapting policies and procedures, and, most importantly, by quantifying the needs of the collection to plan for the necessary staff, materials, and funding to meet those needs. Specific questions that may be addressed in a survey include age and provenance of materials in the collection, binding types, overall condition, damage incurred by the binding or paper of the item, and types of repairs that are needed.

Broadly speaking, surveys seek to answer these preservation questions from one of two perspectives. Depending on the type of collection and needs of the library or archives, surveys may be item-level or based on a random sample. In the professional literature, results of both such surveys have been noted, though far more sample surveys are documented. In most instances, sample surveys are used for large general collections, whereas item-level surveys are used for rare and special collection materials where item-level prioritization is desirable.

Much of the published research on preservation-needs surveys, the most important of which are detailed in this paper, focuses on the techniques used to derive information about library collections, reports on the findings of a survey of a specific collection, or compares assessment work done at various institutions. Approaches to surveying

unprocessed, rare, or special collections are very limited in library and preservation literature, and no publications have been authored on the use of a sample survey to determine the conservation needs of an uncataloged backlog.

## Sample Survey Methods

One important article written on the administration of a sample survey of a library collection is Drott's "Random Sampling: Tool for Library Research."<sup>5</sup> This is a classic article that anyone considering a random sample survey must read as a starting point for understanding methods of random sampling of library materials. Drott describes confidence and tolerance, how to select a sample, the use of random number tables, and how to translate random numbers into selected books on a shelf. This work remains a standard tool for performing a random sample survey of any nature. In 1989, the University of California at Berkeley introduced CALIPR, a computer-based tool programmed to aid in the management of a sample condition survey of general collections in the California State Library that was quickly utilized by other libraries.<sup>6</sup> In 1997, through funding by the U. S. Department of Education, CALIPR was made freely available on a Microsoft Windows platform. CALIPR leads preservation professionals and even those untrained in preservation through a sample survey of their collections and the analysis of the results. Although the technology for the program is now somewhat outdated, CALIPR was widely used at the time and is still available for use on a Windows 2000 platform. It served to disseminate the concept and administration of sample condition surveys for preservation planning purposes and introduced many people to the concept of the preservation survey. In his 1995 article, "Statistical Methodologies for Preservation," DeCandido approaches

a statistical topic similarly covered by Drott, but with a bend towards preservation assessments, and specifically for those using CALIPR.<sup>7</sup> DeCandido discusses how the sample size of 400 items, recommended by CALIPR, may prove inadequate when the assessor is seeking statistically valid data on subsets of a larger collection. He also discusses the different values of data acquired through an item-level versus sample survey and recommends that sample surveys are best used to establish a program or large project, but notes that item-level surveys are best to establish treatment priorities and therefore serve an established program and collection better.

### Sample Survey Results

Libraries undertake preservation surveys for many reasons. Early published surveys were often large-scale and meant to direct the newly established preservation programs. One of the most influential results of a sample survey are found in Walker et al.'s "The Yale Survey: A Large-Scale Condition Survey of Book Deterioration in the Yale University Library."<sup>8</sup> This article reports on the results of the first large-scale survey of the condition of materials, including data from more than 40 Yale library units. To ensure high-confidence results, Yale preservation staff surveyed more than 36,500 volumes of the 7.7 million in their collections. They stratified their sample by library unit in order to make correlations based on environment, circulation, age, and origin of the materials in the various library units based on the data collected. The survey tool asked 16 questions that addressed the scope of the preservation needs and plan for preservation reformatting. Each of these questions had a finite number of responses, and details about the specifics of damage and treatment needed were not taken. This article has profound implications on planning a random sample survey, but does

not cover any of the immediate treatment priorities or preservation actions that were implemented based on the survey.

A few other institutions have undertaken and published the results of sample surveys used to direct the beginnings of a preservation program. Bond et al.'s "Preservation Study at the Syracuse University Libraries" describes a sample survey undertaken by Syracuse University at the establishment of their preservation program in 1985.<sup>9</sup> The purpose was to determine the overall needs of the collection to help direct the fledgling preservation program. A stratified sample survey was designed to ensure that a proportionate number of books from each subcollection of the general collections was surveyed, though random number tables were used to identify individual items on the shelf. Another early sample survey that used similar methodologies as the Yale and Syracuse surveys, but that was not used to establish a new preservation program, was undertaken at the University of Illinois at Urbana-Champaign.<sup>10</sup> This article summarizes a general collections survey that used a stratified random sampling technique. In their research, the authors discuss their findings as well as the unsuccessful application of their sampling technique on such a large collection.

Starting in the 1990s, many preservation programs for larger institutions in the United States and Europe had been established. The survey results published in the literature tend to focus more on specific elements of collections rather than large-scale, collection-wide sample surveys. In Sheehan's "A Condition Survey of Books in Trinity College Library Dublin," the author gives the results of a paper condition survey performed on materials dating from the 1840s through the 1930s located in one gallery of Trinity College Library (approximately 250,000 volumes).<sup>11</sup> Tests performed on a 500-volume random sample of

the collection consisted of fold endurance, burst strength, pH readings, moisture content, and paper thickness. This research differs from many other sample surveys because the random sample was stratified into decades, so that each decade of paper manufacture would be equally represented.

Another sample survey was undertaken by Teper and Atkins in 2003 in an attempt to assess short-term damage at the University of Illinois at Urbana-Champaign since the publication of Chrzastowski et al.'s research in 1989.<sup>12</sup> Though still performed through a stratified sample survey, Teper and Atkins did not attempt to resurvey the identical sample, but instead looked for preservation trends in the collection, including potentially increased levels of paper embrittlement and acidity.

Baird and Schaffner's "Slow Fires Still Burn: Results of a Preservation Assessment of Libraries in Lviv, Ukraine, and Sofia, Bulgaria" provides an excellent resource on assessing preservation needs of largely unprocessed collections in Eastern Europe.<sup>13</sup> Baird and Schaffner's research focused on library collections in Ukraine and Bulgaria's national repositories. By systematically surveying the collections of three research libraries, using a survey tool similar to one used to assess conditions at a research library in the United States and a personal digital assistant computer (PDA), they obtained results that can be compared with other published preservation studies.

### Assessing Special Collections

Although condition assessments and surveys are cited as a key component of a preservation program for special collections repositories, few results of these projects are published. This may be because sample surveys are not frequently used for special collections materials. One exception is Green's "A Method for Undertaking

a Full Conservation Audit of Special Collections of Books and Manuscripts," in which the author outlined the method for statistically sampling cataloged special collections materials in both bound and unbound formats to provide overall condition ratings and estimates of treatment costs on a collection level, with a goal of setting treatment priorities and future grant applications.<sup>14</sup> In his survey, Green used a specific form that generalized damage to one of eight options, provided information on the suggested conservation treatment, and used a combined condition and usability rating scale of 1 to 4 for each item surveyed. Through this data, he projected the cost for repair for the larger collections by comparing the data to previous costs for similar conservation treatments. Green discussed at length how a random sample of the collection was derived and how the costs were determined for both the book and manuscript collections.

Compared to assessments and sample surveys, item-level surveys are much more time-intensive, but can give very specific information for curators and conservators attempting to prioritize collections for repair on an item-level. Although these surveys are critical when planning large-scale conservation treatments of rare book and special collections, few results of these surveys have been published. Documenting and sharing the process by which a survey is undertaken and priorities are established can be extremely helpful to other institutions planning similar projects. In Evans's "The Duke Humfrey's Library Project: Using An Item-by-Item Survey to Develop a Conservation Programme," the author described an item-level survey completed in the oldest part of the Bodleian Library at Oxford University.<sup>15</sup> The survey aimed to assess the volumes' conditions in order to establish a conservation treatment program specifically for this subcollection, with the goal of adapting the tool to larger portions of the Bodleian

Library. The author used the resulting data to help establish priorities for conservation treatment by comparing the assessed condition with the context of each piece within the collection, the curatorial value, and the recorded use, and then attempted to project the best use of resources given that information.

### Summary

The published literature aided in some elements of the design and implementation of this survey; however, the authors found no models that performed a survey of a similar collection—an uncataloged rare book backlog. Statistically significant sampling techniques suggested in the literature provided the basis for the authors' estimation of the number of items to be assessed and the framework for the sampling method. Surveying techniques utilized in general collection surveys could be adapted for work in special collections, however not all elements were similar. Different techniques and amounts of time were needed when surveying materials in the rare book room, and a higher level of detail was required for each piece than in a traditional general collections survey. These elements of the project more closely resembled published information on item-level condition surveys.

Overall, the authors found that the published literature on preservation surveys is rich in reports of general collections sample surveys, but lacking in results of successful surveys completed on special collections materials. No published results were found for a survey of uncataloged arrearsages, or for the preservation and conservation challenges that they create.

### Project Design

Conservators and curators of special collections often feel challenged by the design and the usability of data

collected from surveys of uncataloged materials. Because these materials are uncataloged, several of the most important factors in prioritizing materials for conservation—assigned market value, curatorial value, and use—remain relatively or completely unknown. Therefore, the design of this survey must differ from those of a more traditional survey of rare book materials.

### Goals of the Survey

The survey primarily focused on gathering information to inform future treatment projects and the impact on cataloging. This means that while attention was paid to significant conservation treatment concerns, the survey focused on more general collections care interests, including age and cover materials, need for cleaning, presence of mold or insect infestations, and appropriateness and necessity of protective enclosures and other means of stabilization. The rationale behind this was to reduce handling of materials as well as to aid future conservation planning, as these materials become more accessible to researchers and require more extensive treatments. Lastly, the survey addressed the preservation requirements often obligatory by granting agencies, should the library propose a grant-funded cataloging project.

### Staffing

The conservation librarian oversaw the development, management, and training for the survey. To perform the survey, an hourly library science graduate assistant (GA) with experience working in museums, performing condition surveys of flat paper, and designing databases was hired to work ten hours a week. Together they constituted the research team. The total project required approximately one year, with the conservation librarian assisting in the development of

the survey tool, identification of the random sample, and identification of less common binding styles, materials, and deterioration.

### Design of the Survey Tool

The researchers planned the survey tool (see appendix) to gather information about the following characteristics:

- condition and usability;
- bibliographic information including author, title, general size (miniature, octavo, quarto, or folio), date of publication, shelf location, and book number;
- condition, including binding style, cover materials, board and spine condition, cover-to-text attachment condition, and overall cover and text block condition (including observations for mold, water, and insect damage as well as other damage)—embrittlement was only gauged by visible indications and included no destructive testing;
- previous repairs, enclosures, or other methods of stabilization; and
- open-ended text section for notes on any observations not covered by the previous sections.

None of these sections were designed to go into great detail about the binding or condition of the materials. For instance, no attempt was made to record the exact dimensions of the materials, the types of leather (except in rare cases where it affected the conservation needs of the pieces, such as badly splitting sheep leather), or the sewing structures of the text blocks.

Once the questions for the survey were drafted, the GA entered data directly into a laptop computer using FileMakerPro software. Although the ease and maneuverability of paper survey forms were desirable, the time

necessary to transfer all the data into a computer for analysis outweighed the benefits. The GA also pretested the survey tool on a sample of 6 volumes and adjusted as necessary before beginning the formal survey project.

### Pulling a Random Sample

Before the survey could begin, a random sample had to be identified from the 20,000 uncataloged rare book materials in RBSCL. The RBSCL staff had divided these pieces into three groups according to size (octavos, quartos, and folios) and then arranged the items alphabetically by author, if known, or by title, if the author is unknown. Miniature books were interfiled with the octavos, and no elephant folios were present. These categories accounted for approximately 35 books per shelf for 482 shelves (16,870) of octavos, approximately 15 books per shelf for 188 shelves (2,820) of quartos, and 2 books per shelf for 50 shelves (100) of folios. Each category had been housed in a roughly continuous arrangement, though some breaks occurred due to the layout of the shelving and space availability around the cataloged collections.

The authors selected a sample of approximately 4,000 items, for an estimated 20 percent of the collection, giving 99 percent confidence with a  $\pm 1.8$  percent margin of error. They created a methodology for randomly selecting the items based on existing guidelines for random sampling of library and museum collections and in consultation with the UIUC Survey Research Lab staff. Because the collection was physically distributed according to size, experts at the Survey Research Lab suggested that the sampling method also be stratified by size for the purpose of the survey. A preliminary measurement of items per shelf showed similar numbers of quartos and octavos per shelf, hence both sizes were combined into the

same stratification. From this, staff estimated the proportion of the collection in each classification, as well as the proportional number of items to sample from each. Survey staff then defined the number of items per shelf to be sampled. For example, for each octavo and quarto shelf, 6 books were assessed. For each shelf, the researchers selected the books using a random number table. Due to the nature of the sample and human error in estimating the total number of shelves, a slightly higher total sample (4,036 items) resulted.

Once the survey was begun, however, the GA found significantly more octavos per shelf than quartos, as noted above as their final population dispersal. Although the sampling method produced a higher ratio of quartos sampled than were actually present in the population, the total number of items sampled in each group was still statistically very high and did not affect the overall results of the survey with any significance. The survey assessed 1,140 quartos and 2,590 octavos, which represented approximately 40 percent and 15 percent of the estimated total populations for those sizes, respectively. While the sample size of the octavos resulted in a slightly reduced confidence in the results, the total sample size still resulted in a 99 percent confidence, with a  $\pm 2.3$  percent margin of error, which is sufficiently high to determine the overall needs of all parts of the collection.

### Data Manipulation

Once the survey was completed, the researchers checked the data for errors and redundancy, and transferred them to a Microsoft Excel spreadsheet for manipulation. To simplify the analysis of the survey, and because they had little direct impact on the key analyses sought in this survey, very little cross-relational data are presented. For example, though one can deter-

mine how many vellum bindings had insect damage, figures for binding type and damage are not compared except in select cases where they obviously relate, such as previous water damage and mold development. The information derived from other cross-relations in data fields will be the subject of future analysis by the authors.

## Survey Findings

### Dates of Production and Binding Formats

Much can be learned about this hidden collection from some of the most basic information gathered in the survey. Table 1 shows the distribution of the dates of publication found in the collection. More than 97 percent of the books assessed date from between 1500 and 1700, indicating that this collection is fairly homogenous in age, and is composed of predominantly European publications, as few printing presses were established outside of Europe and Asia during those centuries. The oldest material found in the survey was a vellum manuscript dating from 1175. Although the survey indicates that 0.87 percent of the collection materials dated from the twentieth century, closer scrutiny indicates that these items are all reproductions (predominantly photostatic copies) of earlier publications. Thirty-eight (0.94 percent) of the items assessed had no identifiable publication date.

In addition to the dates of publication, the results obtained about binding materials, shown in table 2, provide information about the nature and history of the materials. For instance, most items bound in full, limp vellum are likely in their original bindings, whereas many of the items bound in cloth have been rebound. Similarly, pieces bound in full leather or vellum would likely have been considered more valuable by their original owners than those items that have remained in their paper wrap-

pers, as books were sold unbound and bound only at the discretion of their owners (though those values may no longer hold true).<sup>15</sup> More than 15 percent (674) of the items assessed were bound in full vellum, and more than 48 percent (1,959) were bound in full leather (84 percent, or 1,650 of those being tight-back binding structures). Only 1.14 percent (46) were bound in full cloth, and 7.83 percent (316) were bound in full paper (74 percent, or 233 of those are pamphlets in thin paper wrappers). The remaining 9.94 percent (401) of the collection were bound in half- and quarter-bound combinations of leather, cloth, vellum, and paper. Five-hundred and nineteen (12.86 percent) were unbound. Although the GA did not attempt to gauge whether the binding was original to the piece, many of the materials and binding structures identified, such as full vellum and tight-back leather bindings, indicate bindings consistent with sixteenth- and seventeenth-century practices. Materials easily identified as rebound are discussed in a later section.

### Damage and Usability Ratings

One of the most basic pieces of data collected during the survey, and the most critical to projecting accessibility by future catalogers and patrons, is the current damage levels of the materials and the estimated usability of each item in its present state. The authors chose to apply two scales, those of "damage" and "usability" to each item assessed.

Damage was assessed on a scale of 1 to 5, with 1 being the least damage; usability was assessed on a scale of 1 to 3, with 1 being the most usable. Most materials (see table 3) assessed fell in the range (damage/usability) of 2/1 (20.3 percent), 2/2 (12.6 percent), 2/3 (0.1 percent), 3/1 (3.4 percent) and 3/2 (32.9 percent). These results indicate that 69.3 percent of the collection, while showing definite signs of wear and tear, incurred only moderate damage and can still be safely handled and used by patrons. An additional 5.2 percent of those assessed show light damage, leaving 25.3 percent of the collection in poor enough condition to offer challenges for processing and patron use.

### Damage Types Identified

Four categories of damage were noted in the survey: "text block damage" (any physical damage or deformities to the pages of the book); "cover damage" (any damage or deformities to the cover of the book); "damage to board attachment" (complete or partial separation of one or both boards from the rest of the book); and "damage to cover-to-text attachment" (compromised integrity of the internal connection between the cover and the text block). Although the last two categories could overlap, a concerted effort was made to use "board attachment" when referring to complete separation of boards or damage to the external hinge, and "cover-to-text" when referring to the internal hinge only.

**Table 1.** Identified dates of publication in assessed materials

Date range	No. of items in sample	% of sample
1100-1199	1	0.02
1200-1299	3	0.07
1300-1399	1	0.02
1400-1499	4	0.10
1500-1599	1,210	29.98
1600-1699	2,706	67.05
1700-1799	33	0.82

Overall, text block damage was predominantly cosmetic as opposed to structural (table 4). While nearly all (97.32 percent) of the collection showed evidence of surface dirt, staining, discoloration, or all of these on at least some of its pages, a much smaller percentage of those assessed exhibited more severe damage. The most common structural damage found was cockling of the text block, which impeded full opening of the text block (exhibited by 74.06 percent of the assessed) and tears in the text block (47.03 percent), while other damage to the text block, such as mold (11.89 percent), detached pages (10.80 percent), visible paper embrittlement (3.2 per-

cent), and losses (8.28 percent), were noted at a much lower occurrence. While the relatively high incidence of tears in the text block indicates a need for care when handling the items, many of the items displayed tears on only a few pages, frequently at the front of the book, and therefore can still be handled relatively safely.

The separation or loss of any pieces of the cover were recorded only as "board attachment" and "cover-to-text attachment," whereas "cover damage" recorded only that damage evident on any remaining covering materials, except where no binding remained. Similar to the damage noted for the text block, much of the most fre-

quently noted damage to the covers of those items assessed was cosmetic, while a relatively small percentage of cover damage was structural or severe (table 5). Overall, at least 81 percent of the collection showed evidence of use through noted abrasion (81.0 percent), dirt (79.2 percent), and discoloration (75.6 percent). More critical types of damage were noted at much lower rates, including brittle (2.3 percent), portions of a board or spine missing (0.3 percent), and covering unattached (delaminating leather or separating cloth, 0.2 percent). The occurrence of mold (4.6 percent), spew (6.5 percent), cockled covers (17.5 percent), and splayed or drummed (16.1 per-

**Table 2.** Binding formats and materials

Binding Format	No. of tight-back	No. of limp	No. of hollow-back	No. of library binding	No. of pamphlet binding	No. of unbound	No. of other	Total	% of each binding material
Full Vellum	82	408	184	0	0	0	0	674	16.70
Full Cloth	6	1	17	17	5	0	0	46	1.14
Full Paper	24	16	68	4	204	0	0	316	7.83
Full Leather	1650	11	289	1	8	0	0	1959	48.54
n/a	1	0	0	0	0	518	0	519	12.86
Full Other	0	0	1	0	0	0	0	1	0.02
1/2 Vellum & Cloth	0	0	0	0	0	0	0	0	0.00
1/2 Vellum & Paper	2	2	26	0	0	0	0	30	0.74
1/2 Cloth & Paper	1	0	3	1	0	0	0	5	0.12
1/2 Cloth & Leather	29	0	16	2	0	0	0	47	1.16
1/2 Paper & Leather	113	0	85	3	5	0	0	206	5.10
1/4 Vellum & Other	2	0	0	0	0	0	0	2	0.05
1/4 Paper & Other	0	0	1	0	0	0	0	1	0.02
1/4 Leather & Other	11	0	1	0	0	0	0	12	0.30
1/4 Vellum & Cloth	0	1	0	0	0	0	0	1	0.02
1/4 Vellum & Paper	8	3	17	0	0	0	0	28	0.69
1/4 Vellum & Leather	4	1	4	0	0	0	0	9	0.22
1/4 Cloth & Paper	3	0	12	7	5	0	0	27	0.67
1/4 Cloth & Leather	12	0	17	1	2	0	0	32	0.79
1/4 Paper & Leather	64	0	51	2	4	0	0	121	3.00
Total	2012	443	792	38	233	518	0		
Percent of each binding format	49.85	10.98	19.62	0.94	5.77	12.83	0.00		

cent) boards (the vellum has warped and shrunk such that the boards are pulled taught and away from the text block) point toward improper storage environments for the items in the past or present. These findings only reinforce known problems with occasionally large fluctuations in both temperature and relative humidity in the RBSCl storage areas that must be remedied. Only 2.6 percent of the items assessed showed no signs of damage to their cover.

Both the data for board attachment and the data for cover-to-text attachment support the assumption that significant binding damage is present in the collection surveyed. More than 18 percent of the items surveyed had one or both boards detached or missing (table 6). For cover-to-text attachment, 5.9 percent of books assessed displayed two broken internal hinge attachments (while still having boards attached to the cover spine), 8.8 percent had one broken internal hinge, and 44.8 percent had weakened hinges (table 7). The survey results for these types of damage demonstrate the consequences of age and use. Although repeated use will weaken the external and internal hinges, the high percentage of items with leather in full-, half-, and quarter-bindings (59.1 percent of the total assessed) and the known weakening of leather if stored in an improper environment may account for many detached and weakened board attachments.

### Repairs and Enclosures

A small number of books assessed show clear evidence of previous repairs to the binding or the text block (table 8). To the best of the authors' knowledge, all of these repairs were made before RBSCl's acquisition. More than 16 percent of the items possess at least one previous paper mend, most frequently to the first few pages of the volume. Binding repairs, however, display a much lower occurrence. Only 7.88

percent of items exhibit spine replacements, 0.12 percent show evidence of cover-to-text repairs, 8.05 percent display other types of cover repairs,

and a very low 0.87 percent of the collection was completely rebound. The observed quality of the repairs varies considerably, ranging from harmful,

**Table 3.** Combined damage and usability scales

Damage	Usability	No. of items in sample	% of sample
1	1	189	4.7
1	2	9	0.2
1	3	13	0.3
2	1	821	20.3
2	2	508	12.6
2	3	6	0.1
3	1	139	3.4
3	2	1328	32.9
3	3	149	3.7
4	1	0	0.0
4	2	151	3.7
4	3	464	11.5
5	1	0	0.0
5	2	0	0.0
5	3	259	6.4
	Total	4036	99.8

**Table 4.** Cosmetic and structural text block damage

Damage type—cosmetic	No. of items in sample	% of sample
Dirt	3,928	97.32
Discolored	3,858	95.59
Stained	3,418	84.69
Ink transfer	2,330	57.73
Foxed	1,671	41.40
Water damage	1,382	34.24
Creased	5	0.12
Surface deposits	4	0.10
Gouged	3	0.07
<b>Damage type—structural</b>		
Cockled	2,989	74.06
Torn	1,898	47.03
Insect damage	1,719	42.59
Mold	480	11.89
Detached pages	436	10.80
Brittle	129	3.20
Losses	8	0.20
Burned	5	0.12
Pages adhered together	4	0.10
Active infestation	4	0.10

amateur repairs on paper and covers, to skillful leather rebacks and rebinds completed by trained craftsmen. Although these data are helpful, rare book curators and conservators likely will find that, while the quantities found for spine replacements and cover repairs are roughly accurate, the less than 1 percent rebound estimation is likely very low. This is due to the fact that the GA performing the survey was not asked to evaluate whether the binding was contemporary to the printing date of the item unless it was extremely obvious that it had been rebound (for example, in buckram or another twentieth-century binding style). Many of the bindings were noted to be in limp vellum (15 percent) or tight-back leather (40.9 percent), which does indicate a high percentage of original bindings.

Although less permanent than repairs, nearly 40 percent of the collection has received some level of basic stabilization, either previous to RBSC's receipt, or since its acquisition (table 9). More than 20 percent of the collection has been tied with varying qualities and ages of cotton twill tape, much of which was replaced during the survey. A fairly high percentage of the collection, 8.2 percent, is stored in brown paper envelopes. These envelopes, while providing a certain amount of structural support to the items they hold, present several conservation dilemmas. Of primary concern is their acidity level. Most of the envelopes and some of the older pamphlet binders observed are not constructed of preservation-quality materials, and the resulting high acidity levels are damaging to the collection materials they hold. Even more distressing, however, is the number of these envelopes with gummed flaps that have been tucked inside the envelope, often in direct contact with the artifact. This practice has resulted in a number becoming soundly adhered to the envelopes in which they are stored (4.2 percent of those items in

envelopes, or 0.35 percent of the total population). Within the past year, the RBSC staff has undertaken a project to systematically replace acidic envelopes and binders with archival-quality, four-flap binders. This project, however, will not address the uncataloged collection for several years. An additional 10.46 percent of the sample was observed to have more permanent and appropriate enclosures, mostly consisting of proper pamphlet binders or folders, clamshell boxes, and slipcases.

## Data Utility

Although the data produced by this survey are interesting as an examination of the physical condition of a specific uncataloged backlog of sixteenth- and seventeenth-century books, the challenge has been to dovetail the needs identified through the survey as much as possible with future cataloging or inventorying projects in order to best use staff time and reduce handling to these sometimes fragile materials.

**Table 5.** Types of cover damage

Damage type—cosmetic	No. of items in sample	% of sample
Abraded	3269	81.00
Dirt	3197	79.21
Discolored	3051	75.59
Leather dry	2093	51.86
Torn	1830	45.34
Stained	1570	38.90
Insect damage	840	20.81
Faded	342	8.47
Spew	264	6.54
Mold	184	4.56
No damage	106	2.63
Water damage	81	2.01
Gouged	13	0.32
Sticky	8	0.20
<b>Damage type—structural</b>		
Cockled	707	17.52
Boards splayed or drummed	651	16.13
No binding	518	12.83
Brittle	93	2.30
Missing portions	14	0.35
Covering unattached	8	0.20
Misshapen	6	0.15

**Table 6.** Recorded damage to board attachment

Damage type	No. of items in sample	% of sample
One board detached	257	6.37
Both boards detached	186	4.61
One board missing	5	0.12
Both boards missing	298	7.38
One board detached, one board missing	9	0.22
No damage	3,281	81.29

To be useful to a broader audience, these recommendations also must be applicable to other institutions with similarly aged backlogs.

The survey shows that immediate preservation needs, ranging from basic stabilization efforts and cleaning through some limited, high-end conservation treatments, are necessary if the RBSCCL staff is to begin handling the collection materials during cataloging or inventory projects. While many items in this collection would benefit from item-level conservation treatment, the authors recommend that a more collectionwide approach first be taken to address the stabilization needs of these items, and very limited conservation treatment be begun for only those items deemed of high value or use potential. Even basic stabilization steps, however, must be prioritized due to the overwhelming number of items in need. To recommend priorities for stabilization, the authors first looked at the entire collections' needs and costs in both supplies and staff time for such measures. These figures, while specific to the RBSCCL collection, represent the same process other institutions must face when prioritizing similar collections. Although priorities for individual items will vary from collection to collection, the overall approach for stabilization, minimal treatments, and full conservation would apply to many other rare book backlogs.

### Cleaning

A cleaning project for all items would be of great benefit to the collection. An observed 4.6 percent of covers and 11.89 percent of text blocks exhibited at least minimal mold (few exhibited substantial mold growth, though no active mold was found during the survey), while an additional 6.5 percent of covers exhibited spew or other surface accretions. While the presence of spew and other efflorescence is predominantly an aesthetic issue,

the presence of mold, even in small amounts, on these materials poses a significant threat to future outbreaks, especially given the history of unstable relative humidity in the RBSCCL stacks. While complete mold remediation cannot be achieved without the use of more rigorous chemical treatments, the risks associated with the presence of inactive mold spores can be greatly reduced by thorough cleaning with a vacuum equipped with a high-efficiency particulate air (HEPA) filter. Using microtool attachments and a variable-suction HEPA filter

vacuum to allow for the most gentle and precise cleaning possible, RBSCCL staff or students could clean each item before processing to reduce the presence of inactive mold spores, as well as improve the appearance of items by removing other surface deposits and dust. Cleaning rare books, especially broken ones, requires more time than general collections materials, and previous cleaning projects in the RBSCCL have required approximately two to three minutes per book for dusting and vacuuming. This would translate into at least an additional 667 hours to

**Table 7.** Recorded damage to cover-to-text attachment

Damage type	No. of items in sample	% of sample
Both internal hinges broken	237	5.87
One internal hinge broken	15	0.37
One broken and one weak hinge	338	8.37
Weak hinges	1,809	44.82
No damage	1,637	40.56

**Table 8.** Previous repairs found

Repair type	No. of items in sample	% of sample
Paper repairs	651	16.13
Cover repairs	325	8.05
Spine replacement	318	7.88
Rebound	35	0.87
Cover to text attachment	5	0.12

**Table 9.** Enclosures found

Repair type	No. of items in sample	% of sample
Brown paper envelope	332	8.23
Library pamphlet folder	319	7.90
Other enclosures	49	1.21
Clamshell	24	0.59
Slipcase	20	0.50
Paper wrapper	2	0.05
Phase box	1	0.02
Mylar jacket	1	0.02
Encapsulated	1	0.02
Total	749	18.54

clean the entire 20,000 volume collection (approximately 13 hours per week for 1 year).

### Physical Stabilization

An estimated 78.4 percent of the collection—those with weak or broken internal hinge attachments (59.4 percent) plus those with one or more detached boards (19.0 percent)—would benefit from basic stabilization treatments. However, fewer than half of this estimated population (39.7 percent) has received any stabilization or enclosure. Treatments as simple as a clean, well-tied cotton twill tie would greatly aid in stabilizing those items that do not already have an enclosure as they are pulled from the shelf and handled for processing. For those items requiring slightly more support, the use of alkaline buffered binder's board cut to the approximate size of the piece and tied to each side of the book with cotton twill tie would give structural support and protection to these higher-risk artifacts. Lastly, for those thin items not presently in binders or envelopes, and for those items in non-preservation quality envelopes (8.2 percent), the purchase of buffered paper envelopes without gummed flaps, or preferably four-flap binders if funding is available, would offer enhanced protection and support during handling and while on the shelf.

Based on the estimated populations from this survey, the supply costs for these basic stabilization measures would be approximately \$386 in unbleached, quarter-inch cotton twill tie (\$0.05 worth of cotton tie per book multiplied by 7,720), \$37.80 to \$90 in alkaline buffered binder's board with quarter-inch cotton twill tie (\$0.45 of board and cotton tie per book multiplied by 84 to 200 items missing bindings or requiring replacement of enclosures, or both), and \$557.60 in replacement buffered paper envelopes or \$9,020 in the pricier four-flap bind-

ers (\$0.34 average cost per preservation-quality top opening envelope or \$5.50 per folder multiplied by 1,640).

Staff time for each method of stabilization would be approximately thirty seconds for each item string tied, one minute for each item string tied with precut binder's board supports (assuming that the Conservation Unit precut the board; its time is not counted in the time estimate), and thirty seconds for each item placed in a preservation-quality envelope or four flap. These preservation efforts would result in an estimated 81.3 hours of additional staff time for the entire collection. Both the time and supply estimates are based on the author's previous experience in performing the same basic stabilization methods on items being stabilized for transfer to high-density storage.<sup>16</sup> Time estimates do not include any marking of the enclosures beyond transfer of call numbers in pencil.

### Conservation Treatment

As stated earlier, a limitation of this survey is that conservation treatment priorities cannot be definitively set using the results of a sample survey. Priorities for high-level conservation treatments, such as leather rebacking, full rebinding, or resewing, must be set by the curator in consultation with the conservator. Due to the time necessary to perform such treatments, they must be undertaken only after careful consideration by the curator, or after a high level of use has been established.

Lower-level conservation treatments, such as minor paper repairs (47.0 percent of the collection, or an estimated 9,403 items), reattaching pages (10.8 percent, or an estimated 2,160), or minor leather hinge repairs (6.5 percent of the collection, or an estimated 1,300 items) may be completed in less time than the more major treatments. Treatments such as these may be completed in house,

and could be planned for treatment after cataloging, if warranted. Using the data collected from this survey and estimating one hour for each minor conservation treatment (though in reality these would vary greatly) would project an estimated 12,863 hours of labor (one skilled conservation technician working full time for 6.5 years).

### Setting Priorities During Processing

Not all items in need can be repaired or even stabilized without a significant commitment in time and money. Although in a few unusual cases, completing a repair may be necessary before cataloging (such as with more serious mold treatments or the construction of boxes for severely broken bindings), the authors believe that this practice should be kept to a minimum, as even small treatments should not be undertaken until the curator completes a cursory assessment of potential use and value of each piece. By weighing the benefits to the collection with the cost of undertaking each level of treatment, basic stabilization will benefit the books most in need for the lowest cost and should be made the first preservation priority. Unfortunately, this stabilization is not meant to be permanent, but only the first phase in future conservation steps. Due to the high risk of mold contamination, a collection cleaning should be considered as a second priority. In similar institutional collections with a reduced threat of mold, cleaning may be considered a lower priority. After consideration by the curator, materials needing minor treatments must be prioritized, and high-priority items should obtain treatment as they are catalogued. Due to the magnitude of need in the collection, a general rule of thumb would be that fewer than one third of items with damage should receive immediate treatment, while others should be prioritized into medium or low priority for treatment. For high-level conservation treatment,

only a select few should be treated before an established use level is identified. Other treatments, as identified in the next section, must be planned for the future as each item's value to the collection is established.

Undertaking these suggested prioritized treatments, even at the most basic levels without any major conservation repairs, is still a costly and time-consuming endeavor for any institution with a collection of similar scope and size. Cleaning the entire collection at the University of Illinois would require 13 hours per week of skilled student labor for one year and \$1,316 in supplies. Basic stabilization would involve an estimated 81 hours of staff or skilled student labor for one year and \$1,033 in supplies, while minor conservation treatments for the entire collection would require a full-time technician for 6.5 years plus minor supplies. More involved conservation treatments would only add labor hours and supply costs exponentially.

#### **Future Conservation Needs and Grant Planning**

From the snapshot taken of the uncataloged collection, the Conservation Unit can make some broad generalizations about the future conservation needs of a significant portion of the RBSCl collections. Items bound in vellum, which represent 18.43 percent of the total "hidden" collection, are at the greatest risk. Vellum is known to react very strongly to the fluctuations in storage climate, particularly relative humidity. This has resulted in a very high proportion of the vellum bindings (87.5 percent of the vellum bindings, or 16.1 percent of the total population) having splayed or drummed boards. While these items would be better shelved and handled if their covers were humidified and relaxed, this treatment is inadvisable until the relative humidity of the storage environment can be stabilized to more properly house such artifacts. Until that time,

badly misshapen vellum bindings can be placed in custom-fitted protective enclosures to make shelving and handling the items easier. Although clamshell boxes are a more common enclosure for use on rare book materials, the more affordable rivet-and-string phase box has the advantage of offering cost-effective treatment with the ability to increase the tightness of the enclosure over time, actually helping to bring misshapen vellum back to a more proper shape. An added benefit of any protective enclosure is the addition of a protective, buffering layer between the artifact and the fluctuating environment. This layer reduces the effects of swings in temperature and relative humidity on hygroscopic vellum bindings. Rivet-and-string phase boxes can be made in-house by the Conservation Unit or outsourced through a contracted commercial binder for between \$7.50 and \$15, excepting folio-sized enclosures, which would be more costly based on their size.

Unlike vellum, many other conservation repairs are not as closely related to the environment and could be undertaken even if RBSCl's storage environment is unchanged for the near future. Those items having no bindings or having missing or detached boards should be a high conservation priority because they are structurally unstable and present challenges to catalogers, shelving staff, and patrons. With an estimated 20.5 percent (4,100 items) of the collection missing entire covers or at least one board, and 11.3 percent (2,260 items) of the collection having at least one detached board, priorities must be established so that those items of the greatest value will be treated first. As a broad estimation using the result of the survey, approximately 3 percent of materials would require resewing; 17 percent of the collection (an estimated 3,400) would require rebacking (distributed by material: 8 percent vellum, 77 percent leather, 2 percent cloth,

and 13 percent paper); and 2 percent would require recasing (distributed by material: 21 percent leather, 1 percent cloth, 14 percent paper, and 64 percent with no binding present but too large to store in an envelope). These priorities should be established in close consultation with the collection's curators. One potential avenue for setting these priorities would be assigning general monetary and curatorial values as items are cataloged. Those items exhibiting a certain level of damage, such as no binding or missing boards, and having a high value assignment would be given top priority for conservation treatment from the uncataloged collection. Even these priorities, however, must be balanced against the significant conservation needs of the cataloged collection.

The results of this survey serve two purposes toward future grant planning. First, the project has assessed and quantified the preservation and conservation needs of the collection. Many granting agencies will not consider a grant application for improving intellectual access to materials if the physical condition of the collection is undetermined, as use of materials will usually increase once intellectual access is improved. Second, it offers cost-effective suggestions for improving physical access to the materials at a relatively low cost that could be included in the budget for an access grant, thus simultaneously improving both intellectual and physical access to the materials.

#### **Conclusions**

Through the use of a random sample survey, the Conservation Unit was able to determine a great deal about the condition of the hidden uncataloged backlog in UIUC's Rare Book and Special Collections Library. The data collected have resulted in a clearer understanding of the preservation and conservation challenges in the collection. Through the quantification of

the types of bindings, their usability, and the types and degrees of damage found, the Conservation Unit has been able to move toward establishing guidelines for immediate, basic preservation efforts that can be integrated with future cataloging project for relatively little cost, as well as determining methods for prioritizing future conservation treatments. Due to the nature of the collection, the findings that are not related to the immediate environment (mold and vellum splaying) also can be used by other institutions holding similar backlogs as a general guide to the conservation needs of such collections. While the costs and exact percentages of each type of treatment will differ from institution to institution, the process by which priorities were set also can be applied to other collections. Every rare book collection will have its own acquisition history and individual strengths and weaknesses. This survey can provide a methodology to help others come to terms with the needs of their richest collections, and move the conservation of the nation's cultural heritage forward.

### Further Study

This paper does not represent all the data collected in the survey and does not provide any cross-relationships between multiple factors. While these cross-tabulations are useful, they are beyond the scope of this initial study. Further study into the relationships between the date of publication, type of binding, and observed damage may provide results that could lead to a heightened ability to project conservation needs. Additionally, viewing the results of this survey in comparison to the results of a similar survey of RBSCl's cataloged collection would be interesting. Higher use results in greater wear and tear, but also can result in an increased awareness of needs and likelihood of repair.

Anecdotal evidence from multiple conservators and preservation administrators indicates that such uncataloged collections show a higher level of disrepair, but no formal studies have sought to prove this as true.

The authors have hypothesized that uncataloged backlogs in other research collections are likely in similar condition. Although the results of this survey may be used by other libraries as a general representation of similar collections, comparing the results of a condition survey of other uncataloged backlogs could establish trends and similarities.

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Appendix: Survey Form

Rare Book Collection Condition Survey

Date Surveyed

Damage  1-not damaged or light damage  3-prevalent damage  5-heavy damage  
 2-minor damage - wear or aging, etc  4-significant damage - repair required

Usability  1-can be used without mediation  2-can be read with supports and training  3-requires curatorial mediation for use

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**Bibliographic Information**

Author Name  Size  Location   
 Title  Number   
 Date of publication

<p><b>Condition</b></p> <p><b>Binding Type</b></p> <input type="checkbox"/> Tight Back sewn on cord/tape <input type="checkbox"/> Limp <input type="checkbox"/> Hollow back / Publisher Case <input type="checkbox"/> Library Binding <input type="checkbox"/> Pamphlet-Bound <input type="checkbox"/> No Binding <input type="checkbox"/> Other...	<p><b>Covering Material</b></p> <input type="checkbox"/> Vellum <input type="checkbox"/> Leather <input type="checkbox"/> Cloth <input type="checkbox"/> Paper <input type="checkbox"/> 1/4 bound <input type="checkbox"/> 1/2 bound <input type="checkbox"/> Full bound <input type="checkbox"/> N/A <input type="checkbox"/> Other...	<p><b>Boards</b></p> <input type="checkbox"/> Front detached <input type="checkbox"/> Front missing <input type="checkbox"/> Back detached <input type="checkbox"/> Back missing <input type="checkbox"/> Other... <p><b>Spine</b></p> <input type="checkbox"/> Partially detached <input type="checkbox"/> Detached <input type="checkbox"/> Headcap damage <input type="checkbox"/> Missing <input type="checkbox"/> Sewing Broken <input type="checkbox"/> portions missing <input type="checkbox"/> Other...	<p><b>Cover-to-Text Attachment</b></p> <input type="checkbox"/> Internal hinge detached Front <input type="checkbox"/> Internal hinge detached Back <input type="checkbox"/> Tenuous attachment <input type="checkbox"/> Weak <input type="checkbox"/> covering material <input type="checkbox"/> spine lining fabric <input type="checkbox"/> pastedown <input type="checkbox"/> cords <input type="checkbox"/> Sound <input type="checkbox"/> Other...
<p><b>Cover Condition</b></p> <input type="checkbox"/> Discolored <input type="checkbox"/> Stained <input type="checkbox"/> Water Damage <input type="checkbox"/> Molded/Mildew <input type="checkbox"/> Dirt / grime <input type="checkbox"/> Faded <input type="checkbox"/> Leather dry/weak <input type="checkbox"/> Visibly Brittle <input type="checkbox"/> Cockled <input type="checkbox"/> Torn <input type="checkbox"/> Abraded <input type="checkbox"/> Insect Damage <input type="checkbox"/> Active infestation <input type="checkbox"/> boards splaying <input type="checkbox"/> spew <input type="checkbox"/> gouged/slashed <input type="checkbox"/> missing portions <input type="checkbox"/> cover otherwise mis <input type="checkbox"/> cover material unac <input type="checkbox"/> sticky <input type="checkbox"/> Other...	<p><b>Paper Condition</b></p> <input type="checkbox"/> Discolored <input type="checkbox"/> Stained <input type="checkbox"/> Water Damage <input type="checkbox"/> Foxed <input type="checkbox"/> Molded/Mildew <input type="checkbox"/> Dirt / grime <input type="checkbox"/> Ink Transfer <input type="checkbox"/> Cockled <input type="checkbox"/> Visibly Brittle <input type="checkbox"/> Torn <input type="checkbox"/> Detached Pages <input type="checkbox"/> Insect Damage <input type="checkbox"/> Active infestation <input type="checkbox"/> pages stuck together <input type="checkbox"/> creased (significantly) <input type="checkbox"/> loss <input type="checkbox"/> surface deposit <input type="checkbox"/> burn holes <input type="checkbox"/> odd colored pages <input type="checkbox"/> gouged/slashed <input type="checkbox"/> uncut <input type="checkbox"/> ragged <input type="checkbox"/> Vellum pages <input type="checkbox"/> Atypical spotting <input type="checkbox"/> Other...	<p><b>Previous Treatment</b></p> <input type="checkbox"/> Inappropriate/Damaging <input type="checkbox"/> booktape <input type="checkbox"/> Enclosure <input type="checkbox"/> Library pamphlet folder <input type="checkbox"/> Brown paper envelope <input type="checkbox"/> Clamshell <input type="checkbox"/> slipcase <input type="checkbox"/> phase box <input type="checkbox"/> mylar jacket <input type="checkbox"/> paper wrapper <input type="checkbox"/> inappropriate size <input type="checkbox"/> rebound <input type="checkbox"/> Cover repairs <input type="checkbox"/> Spine replacement <input type="checkbox"/> Paper repairs <input type="checkbox"/> cover to text attachment <input type="checkbox"/> Twill tie <input type="checkbox"/> Binders board supports <input type="checkbox"/> Harmful inclusions <input type="checkbox"/> Inappropriate labeling <input type="checkbox"/> encapsulated <input type="checkbox"/> Other...	<p><b>Decoration</b></p> <input type="checkbox"/> Clasps/ties <input type="checkbox"/> Faux tight back <input type="checkbox"/> Paste paper <input type="checkbox"/> Painted edges gilt <input type="checkbox"/> Painted edges all <input type="checkbox"/> Tooling gilt <input type="checkbox"/> Tooling blind <input type="checkbox"/> Marbled pastedowns <input type="checkbox"/> Gauffering <input type="checkbox"/> Bookmark <input type="checkbox"/> Bookplate/provenance marker <input type="checkbox"/> Other... <p><b>Other Notes</b></p> <p>Other Notes <input type="text"/></p>

# Book Reviews

Edward Swanson

***Community, Collaboration, and Collections: The Writings of Ross Atkinson.*** Eds. Robert Alan and Bonnie MacEwan. Chicago: Association for Library Collections & Technical Services, 2005. 307p. \$75 (\$67.50 ALA members) paper (ISBN 0-8389-8361-8).

When Ross Atkinson, Cornell University's associate university librarian for collections, agreed to present the keynote address for the 2003 Tennessee Library Association annual conference, I proposed that he speak on themes from his article, "Contingency and Contradiction: The Place(s) of the Library at the Dawn of the New Millennium."<sup>1</sup> My library colleagues had used the piece to envision our evolving library services, so the invitation was partly selfish, as I wanted the opportunity to explore the themes of the piece more thoroughly with the author. Because "Contingency and Contradiction" promoted collaboration among various types of libraries, the context was highly relevant for the multitype audience at a state library conference. However, Ross had moved on in his thinking, and presented, as he often did, a thoughtful and provocative keynote, "Trust and Transversality: The Future of Information Services," that was subsequently published as "Transversality and the Role of the Library as Fair Witness."<sup>2</sup> The article appeared at about the same time as *Community, Collaboration, and Collections*, a compilation of twenty-five publications by a librarian whose work is among the most challenging, inspiring, and provocative in the scholarly writing of our profession.

The contents provide both narrative and synthesis of the significant collection development and management issues of the past two decades, accentuating the transition from a print world to today's hybrid print-electronic environment that presages a more digital future. While each item in *Community, Collaboration, and Collections* stands alone, the entire work could serve as a theoretical and topical complement to Peggy Johnson's *Fundamentals of Collection Development & Management* or G. Edward Evans's *Developing Library and Information Center Collections* as textbooks.<sup>3</sup> For readers seeking in-depth synthesis of contemporary collection development issues, Atkinson's work is grounded in a profound service ethic committed to connecting people and information.

The vivid introduction by Sarah Thomas, Carl A. Kroch university librarian at Cornell, movingly illuminates Atkinson's significance as a contemporary visionary with a gift for creative thinking and clarity of expression. From his first library-related article in 1984, to the release of *Community, Collaboration, and Collections* in 2005,

Atkinson published more than two dozen substantive articles and other works. He won the 1985 RTSD Blackwell North America/Resources Section Scholarship Award for "The Citation as Intertext: Towards a Theory of the Selection Process," the article that Thomas observes, "launched his career as one of the profession's most original thinkers" (vii). Subsequent publications won awards in 1992, 1993, and 1999. In April 2003, Atkinson appeared on the cover of *College & Research Libraries News* as the recipient of ACRL's Academic/Research Librarian of the Year. Thomas's introduction captures Atkinson's personal style and brilliant mind. Drawing parallels between his passion for running and the disciplined intensity of his communications style, she describes his work as "characterized by tight definition, linguistic precision, and a combination of abstract reasoning that is frequently reduced to a simple predictive statement or recommendation" (vii). Only a few months after the appearance of *Community, Collaboration, and Collections*, on March 8, 2006, Thomas made the sad announcement of Ross Atkinson's death. As the information community mourns Ross's death, this book is a timely celebration of his momentous impact on the profession.

Editors Robert Alan and Bonnie MacEwan, prominent contributors to the collection development and acquisitions literature, acknowledge the genesis of the work as a way to honor Ross Atkinson for his brilliant and original contributions to librarianship. Noting that his work and ideas have shaped careers, they present, in reverse chronological order, eighteen journal articles, four book chapters, a seminar paper, a literature review, and a guest editorial published from 1984 through 2003. Each publication constitutes a chapter. The book title echoes Sarah Thomas' observation about Ross Atkinson, "He often exhorts practitioners to higher ideals of community, collaboration, and, of course, collections" (vii). Several articles in the collection acknowledge an earlier paper that Atkinson presented at a conference, reflecting his penchant for testing ideas before an audience as a step in crafting a publication.

A nearly complete Atkinson bibliography with full text in a single, convenient package, the hefty 307-page paperback is approximately letter-sized. Visually, the bottom margin is a bit skimpy, and the font size, while readable, leans toward smallish. However, the clarity of the type on the page is of excellent quality, and Atkinson's line drawings are well-reproduced. This reviewer noticed two minor citation omissions or errors in an otherwise well-documented text. No page references are given for chapter 17, "The Conditions

of Collection Development,” which comes from pages 29–48 of *Collection Management: A New Treatise*. Chapter 21, “Old Forms, New Forms,” published as the fiftieth anniversary feature in *College & Research Libraries*, comes from pages 507–20, rather than 514–15. Securing permissions for the reprints required significant effort, and the editors express appreciation to Pamela Bluh and publishers for their assistance. For librarians who may have compiled personal folders with Atkinson articles for future reference and inspiration, *Community, Collaboration, and Collections* contains nearly all his library-related publications, except for three significant works published after this compilation. In July 2004 *Library Resources & Technical Services* reprinted “The Acquisitions Librarian as a Change Agent in the Transition to the Electronic Library” with Atkinson’s “reflections” as an introduction.<sup>4</sup> The “Transversality” article mentioned above appeared in *Library Quarterly* in April 2005. Most recently, Atkinson’s “Six Key Challenges for the Future of Collection Development,” an introduction to the breakout sessions at the Janus Conference on Research Library Collections held in October 2005, is available online in Cornell University’s institutional repository.<sup>5</sup>

Ross Atkinson earned both Masters (1969) and Ph.D. (1976) degrees in Germanic Languages and Literatures from Harvard University before receiving his MLS degree at Simmons College in 1977. His first position at Northwestern University as a scholar-librarian was an innovative approach to integrate the library more fully into teaching and research activities. Ross subsequently became humanities bibliographer at Northwestern, and then moved to the University of Iowa in 1983, where he became assistant university librarian for collection development. From 1988 to 2006 he held several assistant university librarian-level titles at Cornell University. Atkinson had an active professional profile beyond his writing. A leader in the American Library Association, both in ALCTS and the Association for College and Research Libraries (ACRL) divisions, he chaired many ACRL groups and served as the ALCTS divisional representative to ALA Council. He contributed to numerous Association of Research Libraries, Research Libraries Group, and Digital Library Federation projects. Ross organized the Janus Conference to celebrate and envision the future of collection development in hopes that discussion would hasten the transition to digital collections and access.

Atkinson’s writing crossed a wide swath of topics that embraced collection development, preservation, acquisitions, digitization, and scholarly communications. A glance through the table of contents reminds us of his propensity for definition and rationale. The book’s epigraph quotes Atkinson’s hope that if the compilation “will get folks to stop for a moment, and to consider what they are doing and why, that would be for me the ultimate success” (vi).

For anyone unfamiliar with Atkinson’s work, the award-winning articles are a good introduction to his writing. “Managing Traditional Materials in an Online Environment: Some Definitions and Distinctions for a Future Collection Management,” won the 1999 Blackwell’s Scholarship Award for its focus on the relationship between digital and print objects in an increasingly online collection. Simple illustrations with line drawings help the reader follow Atkinson’s complex reasoning. “Networks, Hypertext, and Academic Information Services: Some Longer-Range Implications” won the K. G. Saur Award for the best *College & Research Libraries* article of 1993. Envisioning the sea change that could be possible with the combined power of networks and hypertext, the piece explored potential new roles for librarians to take advantage of technological capabilities. In “The Acquisitions Librarian as Change Agent in the Electronic Library,” which won the Best of LRTS Award in 1992, Atkinson observed that acquisitions librarians were the least prepared for the transition to the digital age, but uniquely positioned to lead change because of their business acumen. He advised acquisitions librarians to broaden their economic knowledge of electronic publishing; to acquire a deeper understanding of information technology; and to strengthen their understanding of mediation services. His witty, somewhat self-effacing introduction to the 2004 reprint in *LRTS* of “Learning from the Past” affirms his earlier recommendations with an updated prediction, “The ultimate challenge and opportunity, therefore, for the acquisitions librarian as change agent and facilitator of reappropriation—heralded admittedly somewhat prematurely in this article written in 1991—may well lie in the conceptualization and implementation of a distributed business plan for open-access publishing” (215).

Perhaps the publication of *Community, Collaboration, and Collections: The Writings of Ross Atkinson* will lead to more in-depth study of the Atkinson canon. While the chronological presentation in this compilation does not provide a context or subject grouping—if, indeed, that is possible—the depth of content in the Atkinson works offers the potential for future exploration of his themes and analysis of changes in his vision over time. This celebration of Ross Atkinson’s life and work is an enduring tribute that promises to inspire rereading of fundamental scholarship that will be relevant for generations to come. Unquestionably, librarians who read Ross Atkinson will consider what we are doing and why.—Linda L. Phillips (llphillips@utk.edu), University of Tennessee, Knoxville

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**The Nature of "A Work": Implications for the Organization of Knowledge.** By Richard P. Smiraglia. Lanham, Md.: Scarecrow, 2001. 182p. \$56.50 cloth (ISBN 0-8108-4037-5).

In the last three to four years, attention to the Functional Requirements for Bibliographic Records (FRBR) has been growing rapidly.<sup>1</sup> FRBR has been hailed as a "data model [that] holds great potential for improving access to library resources," and "FRBRization" has been called a "method for turning online public finding lists into online public catalogs."<sup>2</sup> The revision of the Anglo-American Cataloguing Rules, currently under way as RDA: Resource Description and Access, is being structured with "the conceptual models for bibliographic and authority data developed by the International Federation of Library Associations and Institutions (IFLA)" as a key element in its design.<sup>3</sup> However, concepts in FRBR that people find very difficult to grasp include the definitions of *work* and *expression* and how these differ from each other as well as how they differ from *manifestation*. FRBR, itself, equivocates about the nature of a work, claiming that "the concept of what constitutes a work and where the line of demarcation lies between one work and another may in fact be viewed differently from one culture to another."<sup>4</sup> Therefore, now seems an excellent time for a fresh look at Smiraglia's 2001 book on the nature of "a work."

Smiraglia begins by introducing basic concepts, such as "bibliographic universe," "bibliographic entity," "bibliographic family," "text," "document," and, yes, "work." The dual nature, physical and intellectual, of a bibliographic entity is discussed. He dwells a bit upon the problems of collocating works using the current MARC bibliographic record structure, comparing it with the entity-relationship model. Because FRBR uses an entity-relationship model, this comparison is useful as well as enlightening. Smiraglia's second chapter gives an historical analysis of the concept of the work in Anglo-American cataloging, thus providing us with the cultural context we need to understand "work"

in this culture versus other cultures that FRBR suggests may lead us to other views of "work." Furthering this cultural understanding are chapter 3, which reflects on how the organizing mechanisms of the profession have developed ways of identifying and demonstrating relationships among works, and chapter 4, which considers the roles that works play in society and culture, drawing upon thought and definitions offered by writers in the areas of linguistics, philosophy, literary criticism, semiotics, and bibliography. Chapters 5 and 6 discuss several research studies that have been conducted, particularly on the derivative bibliographic relationship. This is the relationship that is most evident in relating members of a given bibliographic family, the members of which should all descend from the same common progenitor (or "ancestor"). (This is also the relationship that is most problematic in determining when a new work has been created.) Finally, in chapter 7, Smiraglia presents a summary and a "first attempt" at coming up with a "theory of the work" (121). He acknowledges that the data are insufficient to state a full-blown formal theory, but he believes that "the parameters of a theory of the work" can be seen beginning to emerge (129). Several appendices add considerable value to the book. One of particular interest is a chart showing definitions of "work" from twenty-one sources, from Panizzi in 1841 to Smiraglia in 2001.

Publishing being what it is (or at least what it was six years ago), most of Smiraglia's writing for this book was completed by 1999 or 2000. FRBR, having been published in 1998, had not yet grabbed the collective attention of bibliographic organizers. Smiraglia included mention of it as indicative of international work in the area (46–48, 51, 130), but did not discuss it substantially. However, many relevant issues can be found here. For example, a theme running through the book is the idea of ideational content and semantic content, and how these affect the nature of a work. Ideational content is defined in the glossary as the "propositions expressed in a work," or what Patrick Wilson said is often the subject matter of the text (167). The semantic content is defined as the "expression of the ideational content of a work in a particular set of linguistic strings" (30). Changes in these two aspects of content of a work (albeit sometimes using different terminology to express the concepts) appear again and again in the writings of the various authors cited by Smiraglia. It is generally understood that major changes in one or the other of the ideational content or semantic content results in a new work. However, Anglo-American culture has traditionally considered successive editions of a work to be manifestations of the same work, despite the fact that many new editions contain considerable changes to semantic content. Translations may represent totally different semantic content, yet Smiraglia points out that they are generally accepted as reiterations of the original work (130). So, is a "work" really made up of all of the expressions of a

certain ideational content? But if that is the case, why would our Anglo-American culture consider a movie made from a novel to be a different work? These are practical questions that we must address as we attempt to FRBRize catalogs, and this book gives us much background, research, and analysis to use in attacking the problem.

For additional perspectives the reader is referred to a work edited by Richard Smiraglia in 2002.<sup>5</sup> It includes an article by Smiraglia titled "Further Reflections on the Nature of 'A Work,'" as well as a number of other articles by different people discussing the concept of "work" from a variety of viewpoints.—Arlene G. Taylor (*ataylor@mail.sis.pitt.edu*), *University of Pittsburgh, Pa.*

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2. Jennifer Bowen, "FRBR: Coming Soon to Your Library?" *Library Resources & Technical Services* 49, no. 3 (July 2005): 175; Martha M. Yee, "FRBRization: A Method for Turning Online Public Finding Lists into Online Public Catalogs." *Information Technology and Libraries* 24, no. 2 (June 2005): 77.
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**Functional Requirements for Bibliographic Records (FRBR): Hype or Cure-All?** Ed. Patrick Le Boeuf. Binghamton, N.Y.: Haworth, 2005. \$59.95 cloth (ISBN 0-7890-2798-4); \$39.95 paper (ISBN 0-7890-2799-2). Published simultaneously as *Cataloging & Classification Quarterly*, 39, no. 3/4.

The document known briefly as "FRBR" and more formally as *Functional Requirements for Bibliographic Records: Final Report*, issued by the International Federation of Library Associations and Institutions (IFLA) Section on Cataloging in 1998, has inspired much discussion in the years since it appeared.<sup>1</sup> This collection of eighteen articles continues that discussion. It is organized into four sections. The first offers an overview of the history and theory underlying FRBR. The second analyzes FRBR's applicability to specific types of resources, such as hand-press books, orally transmitted works, musical works, and digital collections. The third section discusses several efforts to implement FRBR. Finally, a description of XOBIS, an XML-based alternative

to the FRBR analysis of entity relationships, points toward more adventurous avenues of exploration. Anyone seeking an understanding of the FRBR model should begin with the original report. This collection then serves as a useful examination of the issues raised by FRBR.

The most crucial point to bear in mind about FRBR is that it is a conceptual model. It defines the set of entities that are important to the construction of bibliographic records and defines the relationships between them. FRBR is not a data format like MARC21, nor a rule set like AACR2, nor a mark-up language like XML. It is a set of structured ideas about what bibliographic records must contain to meet user needs. Central to the model are four hierarchically distinguished levels of bibliographic entities: works, expressions, manifestations, and items. As is often the situation with conceptual models, the powerful and persuasive simplicity of its design becomes problematic when applied to real-world cases.

One area of concern that surfaces often in the collection is the definition of the expression-level entity. In her article "Cataloging of Hand Press Materials and the Concept of Expression in FRBR," Gunilla Jonsson quotes from the FRBR report: "Strictly speaking, any change in the intellectual or artistic content constitutes a change in *expression*. Thus, if a text is revised or modified, the resulting *expression* is considered to be a new *expression*, no matter how minor the modification may be" (78–79). The report goes on to observe that such a strict definition of expression may be unwarranted in practice; but the resulting uncertainty about what constitutes different expressions troubles several of the volume's authors. Jonsson notes that books from the hand-press era are marked by typographical differences within an edition that are a poor fit for the strict definition of expression. In his discussion of the AustLit: Australian Literature Gateway's use of FRBR, Kerry Kilner reports that "A new expression is generated only when a work displays evidence of acts of intervention that impacts upon the way the work is received, or upon the meaning of the work" (93). Ketil Albertsen and Carol van Nuys's "Paradigma: FRBR and Digital Documents," describing the use of FRBR concepts in a national repository database of Norwegian digital documents, offers an even looser definition of "the *expression* level: an artist's work may have been expressed both as a novel, a movie, and a radio play" (134). The original FRBR report would have categorized these "expressions" in different forms as separate works. Discussing "Folklore Requirements for Bibliographic Records: Oral Traditions and FRBR," Yann Nicolas proposes that for orally transmitted works, "Expressions would be equivalence classes built on episodes or motifs found in manifestations, not on alphabetical characters" (192). Yann goes on to suggest that "everyone is looking for the good criterion to build expressions, but perhaps the model shouldn't define which

criterion is the good one. Rather, that should be up to FRBR implementers and, ideally, to users to decide” (193). It’s unclear what this degree of freedom in interpreting FRBR would mean for interoperability and sharing bibliographic data among disparate systems.

The treatment of aggregated works—books containing multiple, separately authored pieces, or containing multiple works by the same author—is another theme addressed by several of the volume’s authors. Le Boeuf’s contribution, “Musical Works in the FRBR Model or ‘Quasi la Stessa Cosa’: Variations on a Theme by Umberto Eco,” observes in reference to aggregate works that “what FRBR labels ‘a work’ may have little to do with what we are prone to regard as ‘a work’ in common speech,” but “that FRBR *also* contains the ‘traditional’ notion of what a work is” (114). Le Boeuf proposes a distinction between “*bona fide works* and *fiat works*” (115), with the latter representing most aggregations. Albertsen and van Nuys offer a more elaborate analysis of seven classes of aggregated works (136–42). Thomas B. Hickey and Edward T. O’Neill argue against broadly defining all aggregations of an author’s works as “the same work” (248), but acknowledge that defining aggregate works more narrowly poses serious problems in practice as well, based on their research into “FRBRizing” a set of OCLC records citing Tobias Smollett’s novel *The Expedition of Humphry Clinker*.

Underlying these definitional issues is a certain ambiguity about the nature of the FRBR entities themselves. While some cite the FRBR entities as “*real world* objects, not descriptions of objects” (129), Tom Delsey (as quoted by Glenn E. Patton in “Extending FRBR to Authorities”) more finely observes that the FRBR entities “are bibliographic entities. They reflect intellectual constructs or concepts that are integral to the rules used to create library catalogs, and what is perceived as a specific instance of a particular entity type may vary from one set of rules to another” (42). This again points up the tension between the flexibility with which the FRBR model can be applied and the limits to its hoped-for ability to unify cataloging practices. The differences between cataloging rules and between the files of legacy records that they have created cannot be overcome simply by conceptual modeling.

The volume under review does a good job of bringing to the surface many of the issues being debated in the FRBR discussion. Other articles of particular interest are David Miller and Patrick Le Boeuf’s provocative analysis of the work-like qualities of *mises-en-scene*, “‘Such Stuff as Dreams Are Made On’: How Does FRBR Fit Performing Arts”; Jacqueline Radebaugh and Corey Keith’s review of the XML-based FRBR Display Tool developed by the Library of Congress’ Network Development and MARC Standards Office; and Stefan Gradmann’s “*rdfs: frbr—Towards an Implementation Model for Library Catalogs*

Using Semantic Web Technology,” which sees FRBR as the key to greater exposure for the contents of library catalogs on the Web. Perhaps the best answer to the question posed in the volume’s subtitle is that FRBR is neither hype nor cure-all, but still a work in progress.—*Stephen Hearn* (*s-hear@umn.edu*), *University of Minnesota, Minneapolis*

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***Library of Congress Subject Headings: Principles and Application.*** By Lois Mai Chan. 4th ed. Library and Information Science Text Series. Westport, Conn.: Libraries Unlimited, 2005. 549 p. \$75 cloth (ISBN 1-59158-154-0); \$55 paper (ISBN 1-59158-156-7).

The fourth edition of Lois Mai Chan’s guide to the Library of Congress Subject Headings (LCSH) comes at a time when debates are raging over the cost and utility of a highly structured and controlled subject access system for information retrieval. When the third edition of Chan’s work appeared in 1995, the library and information community did not yet know the affect the Internet and the Web would have on user behavior, or on new developments in access to and dissemination of information resources.<sup>1</sup> The introduction to the new edition acknowledges this change, but it also makes a case for broadening LCSH application beyond traditional library cataloging.

The format of the new edition closely parallels the previous edition. Part 1, “Principles, Form, and Structure,” summarizes the history of subject cataloging and LCSH, and the principles on which LCSH is based. Chan discusses in depth the syntax and semantics of how the various types of subject headings are formed, the rules for the formation of subheadings, and subject authority control and maintenance. The organization is for the most part clear and logical, with useful headings and subheadings guiding the reader in locating a particular section, and an adequate number of examples to demonstrate the rules discussed as well as major exceptions to those rules. On occasion, however, examples confuse more than they enlighten. For example, on page 72, Chan uses the example *Lake George* (N.Y. : *Lake*) to illustrate the use of a generic qualifier to distinguish identical place names. However, on the previous page, instructions are given to invert place names that begin with a generic term. No explanation is given for why the heading is not *George, Lake* (N.Y.).

Part 2, “Application,” guides the reader in applying LCSH. Here and elsewhere, Chan openly acknowledges the difficulty of application consistency when using a large, com-

plex subject heading system. Even the same cataloger might interpret the subject of a given work differently on different days. However, a review of Chapter 8, "Assigning Subject Headings," and the subsequent chapters on assigning headings for particular formats of material and subject disciplines, might help even experienced catalogers to be more thorough and consistent in their own cataloging. The often thorny areas of literature, music, fine art, religion, law, history and genealogy, and archaeology are given particular focus.

There are important changes and updates to this edition. Chapter 5, "Subdivisions," adds a discussion on the distinction between form and topical subdivisions. Chapter 7, "Subject Authority Control and Maintenance," now discusses authority control headings for subdivisions. Chapter 9, "Subject Cataloging of Special Types of Materials," has undergone some reorganization to better reflect the scope of materials being cataloged in today's libraries. Formerly a two-page subsection under the section "Nonprint Materials," electronic resources now warrant their own section, encompassing computer software, databases, computer and video games, and Internet or Web resources. Electronic serials are discussed separately in the "Serial Publications" section. Cartographic materials also have their own section rather than being placed inappropriately under "Nonprint Materials." That section now covers films, non-music sound recordings, and interactive multimedia, but perhaps would be better dissolved altogether. Because so many library resources now cross over the traditional format lines and are well-established in our collections, the concept of "nonprint cataloging" seems a bit quaint in today's world, and serves no real purpose in the book under discussion.

While addressed briefly in the sections on subject cataloging of literature and film, a more in-depth discussion of form and genre headings would have been welcome. This topic is important in digital resource cataloging as well as in the rare books and archives communities. Although LCSH is one of the major thesauri recommended in standards for describing the form or genre of a resource, conceptualizing the use of the terms for this purpose rather than the "aboutness" of subject access requires a different thought process, one that warrants further discussion.

The most significant change in the new edition is the substantially reworked Part 3, "Current and Future Prospects" (called simply "Future Prospects" in the third edition). Here Chan asks whether LCSH has a role to play in today's information environment. She argues that LCSH is widely accepted worldwide and has been adopted beyond the traditional library setting. However, to gain wider acceptance it will need to adapt so that it can be used by a wider variety of people at varying levels of skill and training. She follows this discussion with a new chapter on the Faceted Application of Subject Terminology (FAST) schema, developed by OCLC Online Computer Library Center (OCLC)

for use with Dublin Core records for electronic resources. FAST is an adaptation of LCSH that simplifies its structure and application by relying on postcoordination rather than precoordinated subject strings to identify the subject facets of an item. FAST identifies eight distinct facets: topical, geographic name, personal name, corporate name, form, chronological, title as subject, and meeting name. It is too early to tell whether FAST will gain wide use and acceptance. For the purposes of Chan's book, it functions as a concrete example of how LCSH can remain relevant in the new information environment, but it must be rethought as the information-seeking behavior of our users changes.

The new edition of *Library of Congress Subject Headings: Principles and Application* will fulfill the same multiple purposes of its previous editions: as a textbook in library and information science graduate programs; as a hands-on training tool, and as a handy reference for staff in cataloging departments.—Christine DeZelar-Tiedman (dez002@umn.edu), University of Minnesota Libraries, Minneapolis

#### Reference

1. Lois Mai Chan, *Library of Congress Subject Headings: Principles and Application*, 3rd ed. (Englewood, Colo.: Libraries Unlimited, 1995).

***Metadata for Information Management and Retrieval.*** By David Haynes. London: Facet Publ., 2004. 186p. \$75 cloth (1-85604-489-0).

There is much to recommend in David Haynes' *Metadata for Information Management and Retrieval*. As he writes in the preface "the intention of this book is to help specialists who manage information resources to become easily conversant with this important and rapidly developing area" (xi). The specialists addressed are those seeking to "develop their knowledge and skills in order to manage metadata effectively," and those "faced with strategic decisions about adoption of IT [information technology] applications that use metadata" (xi). When read as a whole, the book serves an additional purpose of reminding its audience of the many and varied types of metadata that need to be considered by information professionals. Readers who will find this book useful include librarians and IT professionals, as well as those interested in pursuing these careers.

The book is organized into ten chapters intended for either individual consultation or to be read as a whole. The first chapter provides an historical overview of the development of metadata from its originations more than two thousand years ago in the Alexandria Library, to the modern conception of the term. An analysis of the purposes of metadata leads Haynes to propose a new, five-point model for considering the purposes of metadata: Purpose 1, Describing information resources; Purpose 2, Enhancing

information retrieval; Purpose 3, Managing of information resources; Purpose 4, Documenting ownership and authenticity; and Purpose 5, Exchanging data between systems.

Much of the rest of the book is dedicated to explicating these five purposes, each having its own chapter, comprising chapters four through eight. Within these chapters Haynes provides very clear descriptions of various metadata standards, schemas, and application profiles for each of the areas in his five-point model. In addition, there are succinct descriptions of the evolution of metadata standards such as the Dublin Core Element Set (DC), MACHine Readable Cataloging (MARC), Digital Object Identifiers (DOIs), and ONline Information eXchange (ONIX). Haynes also elaborates on the applications and the relationships between the various standards. While regularly referring to the model, the explication of each point gives the reader an excellent understanding of how the five purposes relate to each other and why each is important. An understanding of this new model can bring about a conceptualization of the relationships between different standards.

Chapters 2 and 3 provide exceptionally brief overviews of metadata standards, encoding schema, and mark-up languages. This section is the most problematic in that neither of the chapters can be readily understandable on its own. The regular citation of upcoming chapters of the book indicates that more clarity and examples are forthcoming. This leaves the reader with only a vague understanding of concepts explained later in the book. Perhaps these chapters could have been left out and any unique and important content added to a brief section to the introduction or later chapters.

These chapters are not as robust as the reader may expect given the chapter and heading titles. For example, the section "How to catalogue data" does not explain how to do this, but rather gives a few examples of metadata tags used in marking up HTML pages. Within this section, there is no description of how to go about describing data, no reference to guidelines to construct the tags, and no information on how to fill in the data, which would make it more useful to the reader. The section ends, somewhat disappointingly, with the statement that the Dublin Core will be more fully described in Chapter 3. This is one of several examples where potentially useful illustrations are alluded to, but the few remarks provided without illustration may confuse a novice audience. While examples of this nature are primarily limited to these beginning chapters, readers may lose interest in reading the book as a whole, possibly becoming frustrated with the lack of details in the earliest descriptions of metadata standards and practices.

One of the strengths of *Metadata for Information Management and Retrieval* is that Haynes not only discusses the technical aspects of metadata elements for various types of applications, but also the principles and guidelines that

guide and promote their use. He repeatedly points to the need for the development of standards, or at least common frameworks, across different interest groups so that those groups can more easily share information about resources to promote access to those resources. Another strong element of the book is that each of the five stated purposes is laid out in clear terms. Haynes provides theory for the concepts, applications for the five purposes, and possible future developments of metadata.

Chapter 5, for example, which deals with the second purpose, begins with an introduction of information retrieval concepts and how retrieval performance can be measured, before continuing with a consideration of ways in which metadata might improve retrieval. In discussing efficient information retrieval systems, the chapter also deals with the role of indexing, the development of encoding standards, and the use of thesauri, taxonomies, and classification schema. The chapter concludes with a discussion of alternatives and the merits of emerging approaches to resource discovery, followed by an in-depth list of sources for further information.

Each of the chapters that discuss the five-point model for considering the uses of metadata has a similar structure, which is very effective. The last two chapters of the book offer a general handling of metadata and it prospects for the future. This is such a new field that a view of the future is an important element in gaining knowledge of metadata standards, schema, and practices. Each chapter begins with an overview and ends with a summary, making the book more accessible to those who are learning the concepts presented in them for the first time. This strategy works well, as it emphasizes what the author intended to present as the most important aspects of each section.

As a whole, the book accomplishes its purpose of making some of the conceptual aspects of metadata uses and functions more understandable for its readers; however, it does not cover the fundamentals of how to encode with specific schema as does *Metadata Fundamentals for all Librarians*.<sup>1</sup> In addition, while the book does briefly mention some metadata projects, such as DirectGov ([www.direct.gov.uk](http://www.direct.gov.uk)), which provides a portal to United Kingdom government Web sites, it does not go into these in as much depth or breadth as does *Metadata in Practice*.<sup>2</sup> Haynes's text provides in-depth coverage of theoretical aspects, such as how metadata is important for specific tasks, which the two books mentioned above do not do as well. While both of them delve deeply into how librarians can and do use metadata to manage data of interest to library and other cultural heritage institutions' patrons, they do not address many other uses for metadata, such as information retrieval, data modeling, and management of metadata that *Metadata for Information Management and Retrieval* does cover thoroughly.

Haynes provides a clear background in the history of metadata, where it has its roots, and where it may be heading in the future, including metadata for bibliographic description, information retrieval, and business applications. *Metadata for Information Management and Retrieval* is an especially good survey of the issues and implications of metadata and its uses, how these affect precision and recall, retrieval and resource discovery, and management of information resources. Unlike other works in the field of metadata, this book does not require a cataloging background to be understood and appreciated.

However, readers with a cataloging background might learn quite a bit about metadata whose sole purpose is not resource description, including the importance of interoperability between well-established metadata standards, such as MARC, and newer standards whose purposes are enhancing information retrieval, rights management, the management of information resources, and the exchange of data between systems in an online environment. Overall, I would recommend this book to those selecting books for library and information science programs, technical services librarians with a metadata interest, and information professionals in the IT field.—*Jacqueline Samples (jacquie\_samples@ncsu.edu), North Carolina State University Libraries, Raleigh.*

### References

1. Priscilla Caplan, *Metadata Fundamentals for All Librarians* (Chicago: ALA, 2003).
2. Diane I. Hillman and Elaine L. Westbrook, *Metadata in Practice* (Chicago: ALA, 2004).

### Brief Review

#### ***Introduction to Serials Work for Library Technicians.***

By Scott Millard. New York: Haworth, 2004. 147p. \$39.95 cloth (ISBN 0-7890-2154-4); \$24.95 paper (ISBN 0-7890-2155-2).

The book is billed on the cover as a “practical, how-to-do-it text for library technicians and library science students,” a much-needed addition to the library technician literature. Serials have been very much neglected in this realm. There is a section on serials in the seventh edition of *Introduction to Technical Services*, and there are dated (prior to 2000) serials management works, but they are exclusively directed to the library support staff.<sup>1</sup> Scott Millard has made an admirable attempt but, unfortunately, the result is a very uneven work.

The chapters cover acquisitions, ordering, receipt and check-in, cataloging, processing and shelving arrangements, claims, binding, renewals, cessations, automation, and new technology. Every chapter begins with a stated objective for a student using the chapter. For the most part, the chapters

accomplish the stated objectives of the individual chapter and of the book: they do lead the student step-by-step through the various serial processes. Along the way, the content shows the author’s experience and biases.

Much of the discussion of ordering, receipt, check-in, and processing focuses on manual methods, including the use of Kardex. The section on receipt and check-in contains a discussion of the advantages and disadvantages of using automated systems that leans heavily against automated systems. One of the disadvantages mentioned is “Training is necessary” (52), as if training were not necessary for a manual check-in process. A large portion of this chapter also is devoted to recording holdings, including a fairly detailed discussion of the MARC holdings standard. Given Millard’s previous negative review of an automated check-in system, I find the discussion of MARC (which can be of use only in an automated system) to be somewhat jarring. Also, given the discussion of MARC holdings, I find it curious that the MARC bibliographic structure is not addressed at all in the discussion of cataloging.

The cataloging chapter has some completely incorrect information, probably reflecting the author’s unfamiliarity with actual cataloging practice. For example, he states that “the first decision in cataloging a serial is to determine the main entry” (80). This has not been true since the second edition of the Anglo-American Cataloguing Rules (AACR2) was introduced in 1981. At that time there was a major change in the rules, requiring description of the entity before determining entry points. On the same page, the author indicates that “chapter 12 of AACR2 is devoted to cataloging serials.” He cites the 2002 edition of AACR2 in his bibliography, which means that he should have realized that chapter 12 is now devoted to continuing resources, which include (but are not exclusively) serials. Much of the rest of the chapter consists of gross simplifications of cataloging issues. Considering that this book is meant for library technicians, this is not a particularly egregious failing, but the factual errors are.

The index is very light and incomplete. For example, although there is some discussion of invoices in the text, and *invoice* and *debit memo* are included in the glossary, there is not a single reference to *invoice* or *invoicing* in the index. Under the entry “Title changes,” the pages from the cataloging chapter dealing with title changes (94–95) are omitted. Despite a substantial discussion of holdings creation and maintenance, there is no entry for *holdings creation* or *holdings guidelines*, just an entry for *holdings list*. I would not rely on this index to refer me to all appropriate pages in the book, although I suppose the book is short enough that I could skim it to find all pertinent areas.

As is appropriate for a book of this kind, there is very little theoretical discussion of any of the areas of serials work. However, some of the how-to instructions are so

specific that a novice reading this work would think that all libraries do their serials work in this exact manner; a few additional caveats would have been appropriate. Overall, the book appears to reflect the author's experience with serials—strong in acquisitions, check-in, holdings, and reading room maintenance, but weak in cataloging; strong in manual systems, but weak in automated systems; strong in traditional paper serials work, but weak in electronic journal management.

Despite its shortcomings, there is no other book, as of this writing, devoted exclusively to serials work for support staff. As a trainer of staff, I would use this book for

a general overview of the serials process, completely skipping the cataloging chapter. I'm still looking for the complete guide for serials work for support staff.—*Marguerite E. (Maggie) Horn (maggie.horn@suny.edu), Office of Library and Information Services, State University of New York, Albany*

#### Reference

1. G. Edward Evans, Sheila Intner, and Jean Weihs, *Introduction to Technical Services*, 7th ed. (Greenwood, Colo.: Libraries Unlimited, 2002).

**Archival Products**  
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**P/U LRTS 50n2 p148**

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*Library Resources & Technical Services (LRTS)* is the official journal of the Association for Library Collections and Technical Services. Its purpose is to communicate thoughtful reflection on practice as well as research. Any contribution will be considered that takes a critical approach to the questions and problems facing libraries with regard to:

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Library of Congress, Network Development and MARC Standards Office, “MARC 21 Concise Bibliographic: Control Field 008” (Washington, D.C.: Library of Congress, 2004), [www.loc.gov/marc/bibliographic/ecbd008s.html#mrbc008b](http://www.loc.gov/marc/bibliographic/ecbd008s.html#mrbc008b) (accessed May 8, 2005).
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