

## 4

### **Bibliographic Access Reconsidered**

BIBLIOGRAPHY AND BIBLIOGRAPHIC ACCESS  
BIBLIOGRAPHIES  
THE CATALOG RECONSIDERED  
THE CATALOG REDEFINED  
Reconstruction  
Multiple locations  
Multiple indexes  
FUTURE BIBLIOGRAPHIC STRATEGY  
From local to general  
Beyond the Individual Bibliography  
SUMMARY

This chapter draws attention to on-line bibliographies and suggests that the combination of on-line bibliographies and on-line library catalogs will lead to a radical change in how the catalog is defined and constructed. Also, instead of thinking of on-line bibliography as the use of individual bibliographies that happen to be on-line, we shall think more in terms of on-line use of a reference collection. (Endnote 1).

### **BIBLIOGRAPHY AND BIBLIOGRAPHIC ACCESS**

The term *bibliography* is used in several ways to denote the study of books and the making of descriptions of books. Here we are concerned with bibliography as the making of lists of books, articles, and other documents—by subject, by author, and by other attributes—and the making of indexes to those lists. (Endnote 2).

*Bibliographic access* is perhaps the best available term for the whole apparatus of access to records of all kinds (textual, numerical, visual, musical, etc.), in all kinds of storage media (books, journals, microform, computer storage, disks, and so on). Examples of the sorts of bibliography under discussion include *Chemical Abstracts*, *Annual Review of Information Science and Technology*, *Books in Print*, *Readers' Guide to Periodical Literature*, and the *Arts and Humanities Citation Index*.

Bibliographic access includes three central concerns:

1. *Identifying documents*: Which documents exist that might be of interest? The essence of bibliography is the identification and enumeration of documents that would be of interest. Which writings by some specified author? Which articles about some subject? Which books published in some time, place, or language? It is a matter, on the one hand, of creating useful descriptions of documents, and, on the other, of identifying documents that fit any given

description.

2. *Locating documents:* Bibliographies describe documents, but they do not usually tell you where a copy can be found, least of all where the nearest copy can be found. It is catalogs that indicate where copies may be found. During the nineteenth century catalogs became more elaborate in their descriptions and came to look like and, indeed, to be bibliographies of local holdings. The differentiating characteristic of a catalog is that it indicates a location. If it did not we should deny that it is a catalog.

3. *Physical access to material:* Identifying and establishing the supposed location of a document is not the same as having a copy of the document in ones hands, close enough to read. As Eric Moon, former president of the American Library Association, remarked, "I never knew a reader who wanted a book `right now' who left the library wildly enthused by finding a catalog entry for it." (Endnote 3). Physical access—some combination of the user going to the document and the document being brought to the user—is a matter of logistics and technology which we shall discuss in Chapter 6.

## **BIBLIOGRAPHIES**

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

An important feature of bibliography in this sense is that it is primarily concerned with works and editions of works rather than with individual copies of documents. A bibliography on academic freedom might well include a reference to, say, David P. Gardner's *The California Oath Controversy*, but the reference is to the work, and, usually, to a specific edition of a work. Bibliographies are not ordinarily concerned with specific copies of an edition. Information about individual copies is usually included only in exceptional circumstances: one copy is somehow different (a bibliographical variant), or may be the only extant copy known. For rare materials and early printing it is customary to note where individual copies can be found or which individual copy was inspected by the bibliographer. Nevertheless, as a general rule, bibliography deals with published editions rather than with individual copies of an edition.

Because bibliographies describe works rather than individual copies, they are of general interest to anyone who might benefit from knowing of the works that are listed. For this reason publication of, or at least widespread public access to, bibliographies is highly desirable.

Bibliographies, especially continuing ones, lend themselves well to computer-based production which reduces the tedium of the mechanical tasks of sorting, cumulating, updating, rearranging, and indexing a large number of individually brief records. It has become difficult to imagine creation of a bibliography without using a computer and the logical next step to make the bibliography available on-line.

It is reasonable to expect the number of bibliographies that are available in machine-readable form to increase and for them to account for a growing proportion of all use of bibliographies. It is also reasonable to expect that these bibliographies will become available in more different ways: accessible through commercial database services; available as tapes that can be

mounted at computer centers; or available on optical digital disks, such as CD-ROMs, attachable to microcomputers.

The next logical development would be to provide links from the references in the bibliographies to libraries' holdings records. If one were to find an interesting reference to an article while searching *Chemical Abstracts* on-line, for example, it would be an obvious amenity if one could move automatically from the bibliographic reference to a statement of local libraries' holdings of the periodical concerned. This kind of service is beginning to be provided. Even better, one would like to know whether that particular volume is currently available and to be able to send a request for a copy of it.

## **THE CATALOG RECONSIDERED**

Bibliography, as noted above, deals with published works in a general fashion and is not ordinarily concerned with individual copies of works. In contrast, library records are, of necessity, very much concerned with individual libraries, individual copies, and, for that matter, with individual library users. (Endnote 4).

Library catalogs, as we currently know them, are composed of a combination of bibliographic records and of library holdings records, containing both general statements about editions of works and also specific statements about individual copies and their individual locations in particular libraries. One might even argue that, given the limitations of the technology of paper and of cardboard, the only practical way of achieving this linking of bibliographies and library records in the nineteenth century was to create an additional third set of records containing elements derived from each: the modern library catalog.

Library catalogs vary considerably in format according to the technology in use: in book form; on cards; in microform; on-line. Further, if library catalogs are seen as a bridge between bibliographies and library records, it has to be recognized that this is a bridge between two moving and changing objects as bibliographies and internal library procedures both evolve.

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

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

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

1. To enable a person to find a book of which either
  - (A) the author )
  - (B) the title ) is known
  - (C) the subject )
2. To show what the library has

- (D) by a given author
  - (E) on a given subject
  - (F) in a given kind of literature [poetry, drama, fiction].
3. To assist in the choice of a work
- (G) as to its edition (bibliographically)
  - (H) as to its character (literary or topical) (Endnote 5).

In effect, the new library techniques of the mid and late nineteenth century can be viewed as a building up on top of simple finding lists a superstructure of bibliographical access: complex subject headings, added entries, cross references, systematic shelf-arrangements, and so on.

The form of display moved from catalogs in book form to catalogs in card form, which are easier to update, but the principal change was the local development of more elaborate access to the contents of the collection. Modern library catalogs are essentially as defined in the nineteenth century.

A catalog includes an essential element that is normally absent from bibliographies, the call number, although this is in practice an incomplete and imperfect reflection of the precise status of the library's holdings. To determine the actual status it may also be necessary to refer to library holdings records: to the circulation file for the best information on what is where, to serials records to know which pieces have arrived, to the "in process" file to know what has arrived but has not yet been cataloged; and to acquisitions files to know what is believed to be on its way. Although the catalog may show that the library has the book, the book may have been lost.

The present set of relationships can be expressed as follows: Records found in bibliographies may help one find corresponding records in catalogs, if present, and vice-versa. The catalog usually indicates the official location of a copy of a document. But one may choose to (or need to) consult other library holdings records (acquisitions, circulation, serials) for more precise information concerning actual copies of documents and their location. The present relationship between bibliography, library records, and the catalog is shown in Fig 4.1.

[BEST PLACE FOR FIG. 4.1]

In terms of Cutter's definition of the purpose of a library catalog, almost all of the data needed are bibliographical and would be common to any other library catalog or bibliography that listed the same edition. The exception is the locational information: the particular call number and details of each copy, as needed. The locational data would not be the same as those found in other libraries' catalogs listing the same work.

#### *The Catalog as a form of Bibliography.*

In the broader perspective of bibliographic control, library cataloging can be seen as a special case of bibliography defined by the intersection of two subsets:

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

2. The set of records in a library catalog is further defined geographically: the records that pertain to the holdings of a collection, a library, or, for a "union catalog", to two or more libraries.

It is important to stress that the limitation by level of description (monograph edition, journal title), which excludes the more detailed levels of access (journal article, conference paper) commonly needed, is a matter of standard practice, not of principle. Excellent examples can be found of library catalogs that also provide entries for articles in periodicals and individual contributions within books. One example is the *Index-Catalogue of the Library of the Surgeon-General's Office, United States Army*, published in 1880, which evolved into the *Index Medicus* and now *MEDLINE*. Another published example is the *Catalogue of the Library of the Peabody Institute of the City of Baltimore*, 1883-1892, which states in the Preface:

"This catalogue is constructed on the idea that the best possible catalogue is that which best makes known to the average reader the entire contents of a library. It is intended to answer the three important questions: Is a given book in the library? Are the works of a given author there? Which books, articles, and information does a library contain on a given subject? A perfect catalogue would furnish complete answers to all these questions." (Endnote 6).

However, technical and cost considerations resulted in the general practice of omitting detailed ("analytical") access, especially to articles in periodicals, leaving that important role to publishers of bibliographies and indexes mainly operating outside of librarianship.

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

From an operational perspective the library catalog can be seen as a useful amplification of records that are unavoidably needed anyway. The information in a catalog can be useful in a variety of ways to library staff and library users. The difference between modern library catalogs and those before the late nineteenth century is essentially that the modern catalogs have a much larger bibliographical superstructure added to the locational information than had previously been the case.

However, a library catalog has some significant shortcomings as a tool of access. In contrast, published bibliographies are, or can be:

- more complete (extending beyond a given library's collections),
- more selective (focusing on the interests of specific clientele and so, in the terminology of information retrieval, of "higher precision"),
- more capable of special arrangements (as opposed to standardized universal schemes of classification and of subject headings),
- more flexible (because each new bibliography can be done differently),
- more detailed (indicating individual papers within periodicals, articles in newspapers, and papers within conference proceedings),

more descriptive (containing abstracts of the contents),  
more easily deployed to cover new topics of interest as needed,  
more expertly compiled (because bibliographers are more likely than catalogers to be expert subject specialists), (Endnote 7)  
more coherent (because bibliography starts with a topic around which selected references are assembled, whereas, in cataloging, documents are assigned to subjects),  
more cost-effective (because a bibliography's usefulness is not limited to an individual library).

Catalogers have denied these assertions and made counterarguments that, for example, local cataloging (unlike bibliographies published for a general audience) permits access to be adapted to local circumstances and can include items not included in published bibliographies.

In the late nineteenth-century debate between bibliographers and catalogers, bibliographers unsuccessfully argued that the investment made in local library cataloging would be better spent in the improvement of bibliographies that could be published and would be, therefore, of widespread usefulness.

Raynard Swank wrestled with how libraries could combine the advantages of bibliographies with the necessity of local records. A sufficient reason why he was unsuccessful was that, in the last resort, the technology of paper and of cards simply did not lend itself to the physical integration of bibliography and catalog. Subject bibliography (other than cataloging) has developed during the twentieth century largely outside the mainstream of librarianship, with major roles in the creation of and provision of access to bibliography played by individual scholars, professional and scholarly societies, government agencies, and private firms (such as Bowker, Lockheed, and Wilson).

### *Two Perspectives Caricatured*

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

A bibliographer responsible for a chemistry library might take the point of view that there is a published bibliography of the literature of chemistry that should be the users' principal tool of access to the entire relevant literature including the subset that happens to be held in a particular library. The strategy might then be to arrange for plentiful use of *Chemical Abstracts*, perhaps by mounting a copy on-line locally, then seeking to link the citations in *Chemical Abstracts* to the library's holdings records. Perhaps the link could be made by using the International Standard Serials Number (ISSN) for each periodical title and the Library of Congress catalog card number (LCCN) or International Standard Book Number (ISBN) for each monograph. In the meanwhile the library's records would also have ISSN, LCCN, ISBN, or similar numbers attached. (This technique is suggested as evidence that linkage is feasible. Other approaches are possible but outside our present scope). In this scenario, the library user would search *Chemical Abstracts* and be able to ascertain the library's holdings when interested. Possibly, as an option, searches could

be automatically limited, at least initially, to entries with links to library holdings records. Alternatively, that subset with library holdings links could be separated out as an unusually detailed "catalog" of locally held material. Locally-held material not or not yet in *Chemical Abstracts* would pose a problem. Possibly such material could be contributed to *Chemical Abstracts* if on chemistry; perhaps other bibliographies would need to be used for other subjects. Some local supplementation of the files would probably be unavoidable. (This linking of a bibliography with library holdings records has been implemented experimentally for the medical and health sciences for the nine campuses of the University of California by adding recent years of the MEDLINE bibliography to the on-line catalog. (Endnote 8.))

A cataloger setting out to provide access to locally held materials might also note that a traditional library catalog provides almost no direct access to the literature of greatest interest: the individual papers on chemistry, usually published as articles in periodicals. From a cataloger's perspective it would seem logical and traditional to expand the catalog by cataloging each of the articles in the periodicals received by the library and only in those periodicals. The cataloging would be based on national standards but would be adapted to local needs. A significant concern in each library would be the maintenance of local authority control (i.e., consistency in the use of the author and subject headings as modified to suit local needs). Possibly with modern technology and the traditions of interlibrary cooperation, costs would be reduced by using a consortial approach to catalog construction. A shared database of catalog descriptions of articles, technical reports, and books could be developed for chemistry library catalogs, an "on-line chemistry library center," perhaps. Catalog records contributed by one chemistry library would be available as a convenient basis for the derivation of records for the local catalog. This cooperative database, with much broader coverage than any one library, would be available to the librarians, but not, in practice, to library users. *Chemical Abstracts* would be of greatly reduced value because it would duplicate catalog records for everything in the library.

This small vignette identifies the extravagance of a catalog-based approach compared with a bibliography-based approach and invites more extensive examination of the potential role of bibliographies in the future of the catalog.

## **THE CATALOG REDEFINED**

### *Reconstruction*

How should the identification and location functions be approached in the future? To the extent that the card catalog was a product of the limitations of what is no longer the preferred technology, the development of even the most sophisticated electronic version of the card catalog could represent misguided creativity, reminiscent of the continued refinement of sailing ships after steam had become the preferred source of power. To get a better perspective on future library service we should stand back from the conventional catalog and try to view it from first principles.

Three elements—bibliography, library records, and documents—provide the needed ingredients. Bibliographies will continue to be published; documents continue to be collected; and libraries have to have their copy-specific inventory and status records. Computer-based procedures enable records to be linked in ways not previously feasible. The following approach is

suggested:

1. Since bibliographies constitute the principal means of identification, there should be extensive, convenient access to bibliographies regardless of technology.
2. Because it is necessary not only to identify but also to locate material, it should be made possible when searching bibliographies to ascertain the location, call-number, and availability of copies of documents in local library holdings.
3. It would be convenient to have an option whereby searches in bibliographies could be limited to the holdings of one or more particular libraries.
4. It should also be possible for a library user to forward a copy of a bibliographic record to library staff as a request that a copy of the document represented be sent in the original, in photocopy, or by telefacsimile.

These relationships are represented in figure 4.2.

[BEST PLACE FOR FIG 4.2]

There are practical problems to be solved in linking bibliographies with libraries' holdings records. However, there appears to be no obvious technical reason why on-line bibliographies should not routinely be linked to libraries' holdings records, call-numbers, and circulation status for documents. Once that is appreciated who would want to settle for less?

Another way of describing this change in the relationship between bibliographies, catalogs, library holdings records can also be shown in terms of the contents of the records involved. Part a of figure 4.3 shows the conventional records structure of figure 4.1. Part b of the figure shows the simplified structure of figure 4.2.

[BEST PLACE FOR Fig. 4.3]

The use of computer-based techniques to achieve the goal of extensive bibliographical access *combined with* call-number and availability information for documents invites a major reconsideration of the roles and relationships between library collections, bibliographies, and internal library processes:

1. Bibliographies should be viewed, not so merely as library resources, but rather as a dramatic enrichment of bibliographic access far greater than can be provided by the catalog. Not only does the access provided by bibliographies greatly exceed that of catalogs in fineness of indexing but also the sheer quantity of records and their variety are both far greater. Non-trivial intellectual access to the published record *depends* on access to bibliographies. Conventional catalog records, limited as they are to editions of monographs and titles of serials and to locally owned material only, are simply not in the same league in terms of providing bibliographical access.
2. Operating records of libraries (acquisitions, circulation, serials receipts, etc.) should be automated whenever feasible. In the case of acquisitions, circulation, and other useful information, these records should be made accessible to users, and to other libraries, to the extent security and privacy considerations permit.
3. The records in bibliographies will need to be linked to libraries' holdings records. This implies some changes. Neither the traditional marketing through centralized retailers (e.g.

DIALOG) nor the newer, isolated, "stand-alone" systems on CD-ROMS deliver what is needed. Either could do so if standardized interfaces to local libraries' records were provided. Another likely option is for libraries to mount on-line bibliographies locally in conjunction with their library automation systems. A bibliographical search would continue to be a two stage process, as it is with manual searching: The first stage is to identify what exists; the second is to locate a copy. The difference would be that computer-based procedures should be designed not only to handle each stage but also the transition between them. It would be a natural and logical extension of the "Search and Retrieve" protocol (NISO Z39:50) to have a standard interface whereby a set of bibliographical records retrieved from a bibliography could be searched against a set of library records. This would include three separable tasks: transferring back the retrieved set of references from a bibliography, searching that set against a file of library holdings records, and coping with data deficiencies in either file that would impede matching (e.g. lack of linking numbers).

Given the above, two views of the future of the library catalog emerge. From one point of view, *the library catalog, as we currently know it, becomes obsolete*. Given an ability to link records in bibliographies to holdings records, there is no longer any role for the catalog to play. This is entirely to be expected if one accepts that it was the limitations of the technology of paper that prevented the effective combining of bibliographies with library records; the solution adopted in the nineteenth century (and still in use) was to create in the catalog what is, in effect, an alternative local bibliographical structure, a duplicative set of bibliographical records which are also present in bibliographies; and the limitations of the technology of paper and of cardboard are ceasing to be relevant as the newer, more flexible technology of computers replaces it. From this view we can expect the massive bibliographical apparatus of the catalog to be abandoned.

Yet, viewed another way, what we can see is a *redefinition* of the catalog as the totality of bibliographic records made available by a library *that can be linked to holdings records*. In this view the "new" catalog blossoms as a means of providing access to the works in a library with a richness of detail to match the nineteenth-century catalogers' most ambitious dreams. This approach is not really inconsistent with traditional catalog practice. A century ago catalogers sought to add entries for parts of books and periodicals. This and the practice of providing annotations stopped only because it was too expensive. In recent years almost all of each library's catalog records have been copied, through cooperative arrangements, from the Library of Congress card service, from large shared databases of catalog records, or elsewhere. Even "original" cataloging is usually derived from (or verified against) extant bibliographic records as far as is practical.

The many different forms of subject indexing found in bibliographies is a complication. Users with specialized interests should benefit more from specialized indexing than from the standardized approach to subject cataloging used in general (and many specialized) libraries. Attempting to harmonize a Babel of different kinds of subject headings, indexes, and classification schemes would pose serious difficulties. This variety is already present in existing bibliographies, but without the benefit of links to holdings records. The prospect of providing library users not only with extensive, convenient on-line access to a wide range of bibliographies, but also with interconnected access to bibliographies, catalogs, and to libraries holdings is an exciting prospect.

*Multiple locations*

New developments in telecommunications enable on-line catalogs (and on-line bibliographies) to be consulted from a distance. One consequence is that it becomes possible for several libraries to share the same catalog, should they wish. A union catalog brings together the records of two or more libraries, whether a union catalog for all branches of a single system, or a shared on-line catalog for two or more different library systems, or a resource of catalog records (notably OCLC, the On-line Catalog Library Center, in Dublin, Ohio) for catalogers and interlibrary loan staff.

Another consequence is that it becomes possible for the user of one library to use the on-line catalog of another, remote library ("remote access"), though formalities of telecommunications, passwords, and unfamiliar commands may make it more or less inconvenient to do so. Since computers can be programmed to handle tedious routines, it would make much more sense to tell one's local, familiar on-line catalog to extend any given search to remote, unfamiliar catalogs on one's behalf. The new "Search and Retrieve" ("Linked Systems Protocol" standards (NISO Z39:50; ISO 10162/10163)) are designed to facilitate just that. By making any remote catalog a temporary extension of the local catalog, one is, in effect, creating not so much a union catalog but temporary ad hoc *unions of* catalogs as and when needed. This will achieve in the automated library what was done in the paper library when copies of the printed book-form catalogs of remote libraries were exchanged and collected in reference collections.

### *Multiple indexes*

Research on information retrieval effectiveness has shown that different retrieval systems (i.e. different kinds of indexing and classification systems) all work imperfectly, generally work comparably imperfectly, and tend to retrieve different items from the same file. One implication of this research finding is clear: Whether or not one wishes to seek to improve the performance of any given indexing or classification system, it is foolish to rely on any one approach. It is wise to use a multiplicity of approaches and to combine the results. But in the Paper Library maintaining even one subject approach is very onerous. (How many libraries felt able to afford to change systematically all existing catalog entries when revised rules and headings are adopted?). Investing in the creation of multiple approaches in catalogs is *very* expensive. Yet any experienced bibliographer, any experienced researcher, knows that for the best results it is prudent to look in a variety of different sources and the more different they are in their approach the better. Libraries in the United States have felt able to afford subject headings as well as subject classification, but additional approaches, although clearly desirable, would be unthinkable in the Paper Library.

In the shift from the Paper Library to the Automated Library the technological constraints have changed. Indexing that is merely mechanical can now be provided without investing local labor in their creation. Using the words in titles for "title keyword" searching in an on-line catalog is a good example: Only computer programming and computer hardware need be added, not more cataloging staff. Citation indexes constitute another good example of a useful, mechanical, supplementary approach. Indexing that is not simply mechanical can in principle be obtained, by acquiring bibliographies, for example, and used to "enrich" the catalog.

## **FUTURE BIBLIOGRAPHIC STRATEGY**

*From local to general*

Since it no longer matters much where a catalog or bibliography is located, a change of perspective becomes possible: Instead of concentrating on the local catalog and locally held bibliographies, one can think more sensibly in terms of *all* bibliographies and catalogs, or, at least, of all "networked" bibliographic resources. In practice this means all bibliographic files that are available through networks and held by institutions willing to collaborate.

The basic functional requirements for a more general, "networked," collaborative, or universal approach to library collections include the following:

1. The overall bibliographic coverage should be as complete as possible in providing access to the whole of human knowledge.
2. Multiple access points should be provided, minimally by subject as well as author.
3. It should be a distributed system in that everyone should be able to have access to it and that it should be possible for files to be partitioned and copied for efficiency.
4. Bibliographic records should be correct, concise, correctable, and expandable.
5. The bibliographic universe should be built up piecemeal from existing sources.
6. Bibliographic records should state where copies of the documents are located.
7. The bibliographic records should provide a basis for quantitative studies of publication patterns ("bibliometrics").
8. The bibliographic system should help to protect intellectual property.

These are, with only slight revision, the eight functional specifications for a universal approach to bibliographic control enumerated by Henri La Fontaine and Paul Otlet when they set out in 1895 to develop their Universal Bibliographic Repertory, long before computers became available. Their eventual failure, fifty years and many million cards later, was as much a tribute to the limitations of the technology of paper as it was to the world wars and chronic underfunding that also beset them. (Endnote 9.)

*Beyond the Individual Bibliography*

Automating a catalog or placing a bibliography on-line each represents a substantial technological development. But to think only of an individual on-line catalog or of an individual on-line bibliography—even being aware that there are several different on-line catalogs and numerous individual bibliographies available on-line—is to think in terms of the card catalogs and published paper bibliographies of the Paper Library. A major constraint of the technology of paper is that files cannot easily be reformatted, linked, interfiled, or otherwise combined in dynamic ways. This constraint is not characteristic of on-line systems. What if, instead of thinking of individual bibliographies, we were to base our thinking on the knowledge that there are large and growing populations of bibliographies and catalogs on-line, increasingly connected by telecommunications networks, and containing records that can, in principle, be linked, combined, and rearranged? What could happen if instead of thinking of "on-line bibliography" as using a *bibliography* on-line, we were to follow the logic of electronic technology step further and think instead of a *collectivity of*

*bibliographies* on-line, in effect of using a *reference library*—a sizeable universe of bibliographies—on-line?

When considering multiple bibliographies (and catalogs) it can be helpful to think of the various differences between systems:

Different bibliographies represent different, more or less overlapping populations of documents;

Different bibliographies will have more or less different descriptions, even for the same document;

The access points ("indexes") which can be searched vary between systems;

Different systems can have more or fewer reference between different related terms ("See," "See also," and other kinds of cross-references); and

Different retrieval systems support different types of searching even in the same bibliographic files. Some allow complex search requests or searches for keywords, others do not.

So, correspondingly, one can immediately identify five different classes of reasons for extending searches to two or more on-line bibliographies and/or on-line catalogs. Depending on the circumstances, one might want to:

1. Extend a search to another bibliography or catalog because what was desired was not found in the first source, and a new population of documents may contain the information.

2. Extend a search to another bibliography or catalog for a document that has been found because differing bibliographic descriptions can be used to accumulate additional information. For example, consider a medical book present in a library catalog, in a medical bibliography, and in a citation index. All three will have more or less differing bibliographic records for the same document: The catalog will have a standard catalog record and a note of the location of each copy; the medical bibliography may contribute a different, detailed subject description and an abstract; and the citation index can contribute list of other works cited in it and another list of works that cite it. *Combining* these descriptions could improve bibliographic access substantially.

3. Extend a search to other access points. Citations have to be searched in a citation index. The ability to search on other features such as searching by words within a title or abstract, or by the language or date of the document, varies significantly between systems.

4. Try another system that has a better or different network of cross references.

5. Extend a search to another system because it has special searching abilities, such as identifying pairs of words that occur close to each other, or extend the search by downloading results into a personal computer for more detailed analysis ("postprocessing").

Figure 4.4. summarizes the four combinations that emerge as retrieval is extended from one file to multiple files and from one retrieval system to combinations of retrieval systems.

[BEST PLACE FOR Fig. 4.4.]

## **SUMMARY**

Bibliographic access comprises three elements: identifying documents, the realm of bibliographies; locating copies of documents, the underlying purpose of catalogs; and obtaining a copy of a document, the role of document delivery and collection development.

In the late nineteenth century catalogs were made available on cards and an elaborate bibliographic superstructure (and identifying role) was added. After two decades of automating existing bibliographies and catalogs, it has become possible to rethink what should be done in terms of the capabilities and constraints of computers rather than those of paper (and card).

The prospect of a new-found ability to link bibliographies and library holdings records suggests a reconsideration of the bibliographic (identifying) elements of catalogs and a new perspective on the use of bibliographies as a dramatic enhancement and, in a sense, a partial replacement for conventional catalogs.

The rise of telecommunications and the flexibility of computers mean that it becomes practical to use bibliographies and catalogs that are at a distance as well as those that are local. It also becomes more feasible to use more different indexes than previously. The general effect of these changes is to change the perspective from local to general and to extend our view of on-line searching from searching on individual bibliographies to extended searches on multiple bibliographies using multiple retrieval systems. The linking of bibliographic systems through a "Search and Retrieve" standard (Z39:50) provides a basis both for adding access to more different files and for using more different retrieval techniques on any given file.

These possibilities suggest that, in future library services, bibliographic access could be developed to support, from any workstation anywhere, the kind of searching that could be done, tediously and imperfectly, in a well-equipped reference collection of a very large, research-oriented Paper Library. However, "could be" and "will be" are not the same. Here we have concentrated on questions of design and technology. A complicating factor is that technological change also affects the producers of bibliographies, publishers, vendors of on-line services, and others in the library's environment, as well as the relationships among them. It seems likely that conflicting interests between the stakeholders will prove more of a constraint on the development of future library services than narrower questions of design and technology.

*Notes on chapter 4: Bibliographic access reconsidered*

1. This chapter draws on Michael Buckland, "Bibliography, Library Records, and the Redefinition of the Library catalog," *Library Resources and Technical Services* 33 (1988):299-311.

2. For a good introduction to bibliographic access see Patrick G. Wilson, *Two Kinds of Power: An Essay on Bibliographical Control* (Berkeley, Calif.: University of California Press, 1969); Ronald Hagler, *The Bibliographic Record and Information technology*. 2d ed. (Chicago: American Library Association, 1991).

3. Eric Moon, "The Tree from the Front," *library Journal* 89, no. 3 (1 Feb. 1964):574.

4. See Raynard C. Swank for the rival merits of bibliographies and catalogs "Subject Cataloging in the Subject-Departmentalized Library," *Bibliographic Organization*, ed. Jesse H. Shera and Margaret Egan (Chicago: Chicago University Press, 1951), 187-99, and his "Subject Catalogs,

Classifications, or Bibliographies? A Review of Critical Discussions, 1876-1942," *Library Quarterly* 14(1944):316-32. Both are reprinted in Raynard C. Swank, *A Unifying Influence: Essays* (Metuchen, N.J.: Scarecrow Press, 1981).

5. Charles A. Cutter, *Rules for a Dictionary Catalog*, 4th ed. (Washington, D.C.: Government Printing Office, 1904), 12.

6. Johns Hopkins University, Peabody Institute, Library, *Catalogue of the Library of the Peabody Institute of the City of Baltimore* (Baltimore: Friedenwald, 1883-1892, (pp. iii-iv).

7. An argument could be made that this is increasingly *not* the case. Libraries now do little cataloging because they can derive cataloging copy from the Library of Congress (and other expert sources) from the "cataloging in copy" often found on the verso of title-pages, from cooperative databases of catalog records, and in other ways. "Derived" catalog records of higher quality, more completeness, and greater standardization provide a better basis for the developments envisaged in this chapter.

8. Clifford A. Lynch, and Michael G. Berger, "The UC MELVYL MEDLINE System: A Pilot Project for Access to Journal Literature through an On-line Catalog." *Information Technology and Libraries* 5 (1989):371-83.

9. Available in English in Paul Otlet, *International Organization and Dissemination of Knowledge: Selected Essays*, trans. and ed. by W. Boyd Rayward. (Amsterdam: Elsevier, 1990), 25-26.