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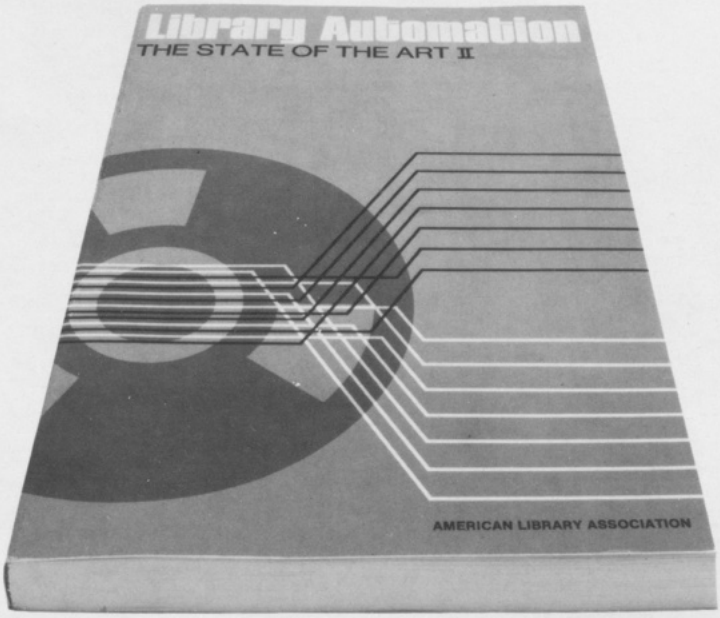

Library Automation

THE STATE OF THE ART II

Susan K. Martin and Brett Butler, editors

These proceedings of the preconference institute, held at Las Vegas, Nevada, in June of 1973, review and evaluate the advances in library automation since the earlier institute in 1967. Unlike the proceedings of the first meeting, they focus on operating systems and operational technology. Leaders in the field present papers reviewing changes in the past five years, a hardware review, four applications reviews (public services, cataloging, acquisitions, and "innovative" applications), a statement of personnel needs, and a forecast for the future. Discussion periods are included in the text and are a valuable supplement to the prepared talks. The volume also includes an extensive bibliography compiled by Martha W. West.

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The IS in ISAD

In his June 1975 *JOLA* editorial, Brian Aveney correctly identified our current library automation systems as being primarily "facsimile reproducers" and challenged us to use information technology to provide new forms of access to library collections. In a still very limited manner, some libraries have accepted this challenge through the provision of computer-based bibliographic services as an enhancement of traditional reference.

More than just an enhancement, however, these computer-based reference services are the first computer applications to directly affect the library *user*. It might be argued that the numerous book catalogs created from machine-readable records and the growing number of COM outputs for public use have an equal impact upon the user, but these are essentially mechanizations of existing manual procedures rather than the provision of a totally different kind of service. With the increasing availability of computer-based reference services and the increasing breadth of their subject coverage, every library now has the capability for the extended reference services once limited to the special library or information center.

Confirming De Gennaro's prediction of two years ago (*JOLA*, December 1973), more and more libraries are utilizing these reference services through interactive, on-line searching offered by commercial vendors: of the ten major suppliers identified in an SDC/NSF study, Lockheed (DIALOG) and SDC (ORBIT) have the largest share of the market. This same study, corroborated by information from Lockheed, estimates that there are approximately 1,000 user organizations throughout the world, which may be characterized as approximately 50 percent industrial, 30 percent university or other educational, and 20 percent governmental at all levels. Lockheed further estimates that it has six to eight public library subscribers to DIALOG exclusive of its DIALIB experiment. While no exact figures are available, there is considerable overlap among subscribers, with many desiring access to both DIALOG and ORBIT—as well as to specialized data bases such as the New York Times Data Bank and MEDLINE—for a variety of reasons.

Growing acceptability of such services in libraries brings with it a growing awareness of the problems associated with their use. In order of importance they are: (1) cost allocation, (2) education of librarians and users, and (3) marketing at the library level. Coming from a tradition of free library service to all, the academic or public librarian faces ideological problems in charging a fee for extended reference services, which cannot be absorbed

in ever-shrinking budgets. While far from a trivial problem, the solution lies within the administrative structure of the affected institutions themselves, rather than being imposed by the outside world.

Libraries are equally uncomfortable with the concept of marketing their services, although public libraries have begun to move in this direction with their outreach programs and the establishment of community information centers. Perhaps the solution lies in adopting the philosophy of a demand economy, rather than the traditional service orientation in which institutions are not only not paid for results but are not even paid according to the extent to which their clients use them.

The most difficult of these problems, and perhaps the most immediate because it is at the same time long term, is that of educating librarians to become "information intermediaries." This problem is not just that of learning commands on a terminal, but a far more basic one of how to approach information *per se*. The traditional reference method in a public or academic library is to respond to a question by supplying an answer from a "reference book." Further effort in the academic library is directed toward educating the patron to use the tools; the arduous literature search on behalf of the user takes place only in the special library or information center. In effect, reference librarians must be retrained as special librarians—accustomed to structuring searches, employing a variety of search strategies, and being familiar with a large number of data bases in various subject fields.

This retraining may take place in a variety of ways: formal course work in a library-school environment, workshops or institutes sponsored by professional associations, in-service training sessions in the libraries themselves. In whatever form, it is essential if libraries are to survive as information suppliers and not be forced to retreat to the role of mere information warehousers. One of the statements of the National Commission on Libraries and Information Science with which we can certainly agree is that "It is essential . . . that all librarians understand the potentials of the new technologies; and this is especially true for those librarians who serve the user directly."

None of these statements is new or startling; they echo the literature and speakers at various conferences during the past few years. Yet no professional library group has accepted the responsibility for finding solutions to these present problems and those that will arise when we move into the next era of reference service, that of true data-base—not just bibliographic—utilization in libraries. Is this perhaps a new direction for ISAD: to move from the focus on housekeeping functions to the exploration and realization of information technology's potential for access to intellectual or subject content?

MARTHA W. WEST

Automated Alternatives to Card Catalogs: The Current State of Planning and Implementation

Kenneth John BIERMAN: Tucson Public Library, Tucson, Arizona.

The results of a study carried out under the auspices of the Council on Library Resources are described. The stated goal of this study was to determine and analyze the current state of planning and implementation for computer-generated replacements for the card catalog (book catalog, microimage catalog, on-line catalog) for large collections (250,000 titles or more) and selected smaller libraries (less than 250,000 titles) that had actually implemented an alternative form of catalog.

INTRODUCTION

Since the beginning applications of computer technology to libraries, there has been interest in the utilization of modern technology to eliminate the card catalog as the vehicle for bibliographic control of library collections. Since 1960, several small and medium-sized libraries (less than 250,000 titles) have replaced their card catalogs with some computer-generated alternative, and work in this area has been reported in the literature.[1-4] There is little published literature, however, on replacements for the card catalog with computer-based systems intended to handle 250,000 titles or more.

In September and October 1974, a short questionnaire was sent to twenty-nine leaders in the library automation field in the United States and Canada asking which libraries were most actively working in the area of automated alternatives to card catalogs. Twenty-four responses (83 percent) were returned with thirty-four uniquely identified libraries. Concurrently, a literature search was made to determine those libraries that had published in the field in recent years. Finally, selected knowledgeable persons were telephoned to get their input. On the basis of this preliminary work, twenty-six libraries (or library-related activities such as cooperative networks, commercial vendors, etc.) were selected for personal visits. These libraries were visited between October 1974 and January 1975. In addition, fifty-one other libraries were telephoned in February and March

of 1975 to get added input into the survey. The Appendix lists all libraries contacted.

Although there was great flexibility in the interviews, certain basic questions were always asked. These included: How long has there been serious interest in automated alternatives to card catalogs? Is there a formal committee, task force, etc., charged with the responsibility to study automated alternatives and report their findings/recommendations? What are the major reasons for interest in automated alternatives to the card catalog? What alternatives appear to be the most desirable and feasible at this time? When do you believe they will be implemented? Do you see your individual library (or institution) accomplishing the goal or will it happen cooperatively (networks, etc.)? Are there any written studies (cost projections, feasibility studies, desirability studies, user studies, etc.) as of now?

For this report, certain words will be used assuming definite and specific meanings. Library will mean a collection of primarily printed materials in the form of published monographs and serials; large collections of technical reports are, for example, generally excluded. A large library is defined as one with 250,000 titles or more in the cataloged and classified collection. An intermediate library is defined as one with less than 250,000 titles. The majority of those libraries called intermediate are between 100,000 and 200,000 cataloged and classified titles. Emphasis is placed on size in titles, not volumes, because it is the number of titles that significantly affects the size of the catalog.

The word *catalog* as it is used in this report generally refers to the union public catalog of the entire collection with the traditional access points of author, title, and subject; thus, for example, automated catalogs of serials only are excluded. Book catalogs refer to hard copy printed book catalogs that are computer printed on a line printer and reproduced or photocomposed and reproduced. Microimage catalogs refer to roll film or fiche catalogs that have been computer produced via a computer output microform or photo composed microform process; microimage catalogs that are produced by photographically filming card catalogs are not included in this study. On-line catalogs refer to stores of bibliographic data searchable by at least the same access points as the traditional card catalog via CRT, typewriter, or some other type of terminal interface.

An open catalog is one that is having new entries added to it. A closed catalog is one that is not having new entries added to it but the existing entries are being maintained (corrections and deletions are being made, etc.). A frozen catalog is a closed catalog without any maintenance of the entries in the catalog.

Why are libraries interested in automated alternatives to card catalogs? Reasons ranged from immediate and parochial, such as moving into a new building with no provision for a card catalog, to philosophical, such as wanting an information system (not just catalog) with the ability to manipulate data to meet real needs.

Reasons given by ten or more libraries were: (1) provide access to the complete (i.e., union catalog of all holdings for a particular library system including the main, branch, and departmental libraries) and up-to-date catalog from multiple places; this is referred to variously as remote catalog access, portability, and distributability; (2) provide more (beyond the usual author, title, and subject) and improved access points and search capabilities; (3) expand the availability of increased resources through the sharing of resources via union catalogs region-wide; (4) eliminate or reduce the inconsistencies and inaccuracies of card catalogs and their inhospitality to change (change in filing rules, headings, access points, etc.) as catalogs become older and larger; (5) reduce the increasing problems and costs of maintaining card catalogs as they grow in number, size, age, and complexity (presumed cost savings of an automated catalog in the future); and (6) deal with pressures and influences for change both internally (from staff and users) and externally (most especially the Library of Congress).

Two additional reasons were cited more than once and with some degree of fervor: the increasing floor space occupied by card catalogs and the increasingly serious physical deterioration of very old and heavily used card catalogs. It is reasonable that as libraries become older and larger these two reasons will increase in importance. Two particularly interesting reasons, among several others included above, were given by Ohio State University: (1) Americans have been conditioned to expect very fast response, and electronic catalogs are the only way to provide fast response; and (2) if librarianship is best served by smaller units of service, then library activities must be decentralized, including decentralized access to the most up-to-date and accurate library records.

The above reasons provide a composite picture of reasons cited by both intermediate and large libraries. There were, however, variations in frequency of reasons cited by type of library. Public libraries cited remote catalog access as the major reason for interest. This is not surprising since public libraries generally have large numbers of branches and maintain many card catalogs that have a high percentage of title overlap. University libraries, however, more often emphasized the improved catalog access through more and improved access points and searching techniques. Given the large and diversified collections of university libraries and the specificity of many of the service requests, this is again not surprising. Also not surprising is the fact that those academic libraries with highly centralized collections tended not to be as interested in remote catalog access as those academic libraries with highly decentralized collections.

There was interest in expanding the availability of resources among all types and sizes of libraries. Inconsistencies and inaccuracies of card catalogs and their rigidity and inhospitality to change were mentioned more by large libraries than intermediate. Increasing problems and costs of maintaining card catalogs were mentioned by many libraries; academic and

public libraries with decentralized collections were concerned about the number of catalogs they were maintaining while large libraries were more concerned with the size and complexity of the very large union card catalogs (some having over 20 million cards).

Pressures and influence for change internally and externally were seldom mentioned by intermediate libraries but often mentioned by large libraries. The most significant external pressure cited by large libraries was the Library of Congress, but not a single intermediate library cited this as a reason. This is not surprising since many large libraries have greatly increased their reliance on LC cataloging in the last few years. Another significant factor is that the activities of the Library of Congress have been followed closely by large academic and research libraries. Several large libraries specifically cited Rather's paper, *The Future of Catalog Control in the Library of Congress,* as well as the presentations at the Association of Research Libraries eighty-fifth Membership Meeting (January 1975), *The Future of Card Catalogs.*[5, 6] Changes planned by LC of concern to large libraries included the abandonment of superimposition, revision of the LC filing rules, revision of romanization policies, and major revision of the subject heading list.

INTERMEDIATE LIBRARIES

Twenty-eight intermediate libraries were contacted (Table 1); the majority were academic libraries (32 percent) followed closely by public libraries (29 percent), and special libraries (25 percent). State libraries, library cooperatives, and service bureaus made up the remaining libraries contacted (14 percent).

The majority (54 percent) have printed book catalogs; microimage catalogs accounted for 29 percent and on-line catalogs for 17 percent. A few of the intermediate libraries contacted did not have automated alternatives but were seriously planning for an on-line catalog through OCLC within the next three or four years, assuming OCLC adds additional access points and search capabilities as well as complete local data (holdings, locations, etc.).

The majority (80 percent) of the intermediate libraries had been interested in automated alternatives for more than two years as opposed to only 25 percent of the large libraries. All of the public libraries contacted had been interested in automated catalogs for over two years and the majority for over five years.

Unlike the large libraries surveyed, the intermediate libraries had far greater diversity of opinion on the future options. Although several (a majority of the academic and special libraries but not a majority of the public libraries) indicated that on-line catalogs were the ultimate, intermediate libraries were far more willing to seriously consider printed book and microimage alternatives. On-line catalogs seemed a long way off because of cost and, for public libraries, because of the problem of many

Table 1. Summary of Libraries Contacted

Personal Visits

Type of Library	*Number Contacted*		
	Intermediate	*Large*	*Total*
Public	2	3	5
Academic	2	10	12
Special	0	0	0
National and State	1	3	4
Cooperatives and Service Bureaus	2	3	5
TOTAL	7	19	26

Telephone

Type of Library	*Number Contacted*		
	Intermediate	*Large*	*Total*
Public	6	2	8
Academic	7	21	28
Special	7	0	7
National and State	0	4	4
Cooperatives and Service Bureaus	1	3	4
TOTAL	21	30	51

Total Personal Visits and Telephone

Type of Library	*Number Contacted and Percentage*					
	Intermediate		*Large*		*Total*	
Public	8	28.6%	5	10.2%	13	16.9%
Academic	9	32.1	31	63.3	40	51.9
Special	7	25.0	0	0.0	7	9.1
National and State	1	3.6	7	14.3	8	10.4
Cooperatives and Service Bureaus	3	10.7	6	12.2	9	11.7
TOTAL	28	100.0	49	100.0	77	100.0

locations and varied educational and experiential levels of users. In this regard the intermediate-sized libraries and large public libraries were in agreement.

Intermediate libraries were not as insistent on authority control as were the large libraries. Several of them mentioned it as desirable and important, but not with the same emphasis as did the large academic libraries.

Like the large libraries, the intermediate academic and public libraries see cooperation and networking as essential for the economic success of automated catalogs. The special libraries were not as interested in the cooperative approach due, at least in part, to the specialized and sometimes confidential nature of their materials.

The largest number of intermediate libraries with automated alternatives had computer-generated printed book catalogs ranging in size from 160,000 titles to 75,000 titles as of January 1975 (Table 2). The majority of the intermediate-sized libraries with printed book catalogs are planning to go to microimage catalogs within three years. The reasons cited were cost and time, in that order. The recumulations and cumulative supplements rise in cost quickly as the number of titles grows because the same entries are continually reprinted. The more frequent the cumulative supplement interval and the recumulation schedule, the greater the cost. As the catalog grows in size, the time lag between cutoff date for data entry

Table 2. Printed Book Catalogs

Library	*Titles Jan. 1975*	*Titles/Year*	*Titles Jan. 1980*
		Large Libraries	
Los Angeles Co., Calif.‡	325,000	15,000	400,000
UC/Santa Cruz, Calif.†	250,000	20,000	350,000
NYPL—Res. Libs., N.Y.‡	220,000	80,000	620,000
NYPL—Branch Libs., N.Y.‡	170,000	40,000	370,000
		Intermediate Libraries	
Fairfax Co. P L, Va.*	160,000	20,000	260,000
Orange Co. P L, Calif.*	150,000	10,000	200,000
Baltimore Co. P L, Md.*	150,000	10,000	200,000
Enoch Pratt Lib., Md.*	150,000	13,000	215,000
Bell Telephone Labs, N.J.	150,000	5,000	175,000
King Co. Lib., Wash.‡	140,000	15,000	215,000
Prince George's Co., Md.*	140,000	10,000	190,000
Hennepin Co., Minn.	100,000	5,000	125,000
Washington Network, Wash.§	75,000	50,000	325,000

* Decision to go to microimage catalog within three years.
† Decision to go to on-line or microimage catalog within three years.
‡ Seriously considering microimage or restructured printed book catalog within three years.
§ The Washington Library Network, housed at the Washington State Library, publishes the *Washington Resource Directory,* which is a union catalog in register/index format and is used as the only library catalog by two public library systems in Washington. The Washington Library Network includes over 120 libraries of all types. Plans include closing card catalogs within two or three years and replacing them with a combination of on-line and microform catalogs as well as converting brief records for all titles to support circulation and finding/locating functions.

and final production of the book catalogs generally increases.

Of the microimage catalogs surveyed (Table 3), nine were fiche and one was roll film. Five were at academic libraries, two were at public libraries, and three were at special libraries. The libraries previously discussed that have printed book catalogs and that plan to go to microimage catalogs were public libraries. Thus, there will be an increase in the number of public libraries with microimage catalogs in the near future. Baltimore County recently announced plans to implement a roll film catalog within a year.[7] All of the microimage catalogs are less than five years old, and the majority are less than two years old. Computer Output Microform (COM) catalogs are becoming popular; they can be produced for a fraction of the cost of a corresponding printed book catalog and in a fraction of the time (weekend turnaround time for a complete cumulation is possible). While none of the printed book catalogs had recumulations any less frequently than yearly, and several had recumulations only every other year, six of the COM catalogs are completely recumulated quarterly and one is recumulated every four weeks.

The three special libraries reported user acceptance as high. The public libraries have not had the microimage catalog long enough to know if and how it is being accepted by the users. The academic libraries generally reported high user acceptance with some reservations. The University of

Table 3. Microimage Catalogs (Computer Produced)

Library	*Titles Jan. 1975*	*Type*	*Maintaining Card Catalog*
Lockheed Missiles, Calif.*	175,000	fiche*	No
Boeing Co., Wash.	150,000	fiche	No
U.T./San Antonio, Tex.	130,000	film	No, but plan to create A/T card catalog
Florida Tech. U., Fla.	120,000	fiche	Yes, and plan to continue
Marin Co., Calif.	100,000†	fiche	No
U.T./Permian Basin, Tex.	90,000	fiche	No
Georgia Inst. Tech., Ga.‡	75,000	fiche	Yes‡
Tulsa City-County, Okla.§	50,000	fiche§	No
U.T./Dallas, Tex.	50,000	fiche	No
Eastman Kodak, N.Y.	50,000	fiche	No

* Previously was a roll film catalog.
† Total expected in June 1975.
‡ The remaining collection (125,000 titles) is also available in a microimage catalog that was produced by filming the card catalog. These titles are gradually being added to the data base and included in the COM catalog. When this is completed (in two or three years), the card catalog will be discarded.
§ Previously was a printed book catalog.

Texas/Permian Basin did a survey of user reactions and found that 9 percent of the student users and 13 percent of the faculty users complained about the microimage catalog. The most common complaints were readability (hard on the eyes) and usability (readers difficult to use). The Georgia Institute of Technology also had a partial user survey completed, and their interesting experiment with remote access microimage catalogs is the only one documented in the literature.[8-10]

If microimage catalogs are new, experimental, and rare, on-line catalogs are even more so. None of the libraries contacted were relying exclusively on an on-line catalog. One academic and three special libraries contacted in the intermediate group had partial on-line catalogs. The Rochester Institute of Technology (New York) is currently converting its 150,000 titles into a locally developed on-line system; that portion of the collection converted is available on-line. The card catalog continues to be maintained. After conversion is completed in two years, the file will be available on-line as well as in microimage (roll film). The Aerospace Corporation Library (California) has 80,000 titles on-line. Subject access, which is not yet implemented, is scheduled to be available in late 1975; in the meantime, a card catalog continues to be maintained. NASA has several libraries using an on-line file of 60,000 titles to supplement their card catalogs in various ways; microimage catalogs are also planned for the future. Finally, IBM has a few libraries with small (20,000 titles or less) on-line catalogs which for the most part are in addition to existing card catalogs. Several of the intermediate libraries that are OCLC participants plan on closing their card catalogs within five years and using the OCLC system as the vehicle of catalog access after that time. They all emphasize, however, that such a decision is dependent upon developments at OCLC, particularly in the area of access points and search capabilities (subject access as well as much better author/title access is required) and availability of complete local data

(local variations to the bibliographic data as well as local call numbers, holding and location statements are not now available through the on-line system).

The intermediate libraries contacted are very willing and eager to engage in experimental catalogs for future use. Many libraries in this size range have been doing so for several years, and it is clear that they intend to continue doing so. Automated catalogs provide them the flexibility, and trauma, of changing and reordering the display of the bibliographic data as desired to meet changing needs both for the using public and the library.

LARGE LIBRARIES

Forty-nine large libraries were contacted (Table 1), the majority being academic libraries (63.3 percent). The remaining 36.7 percent were about evenly divided between public libraries, state and national libraries, and library cooperatives and service bureaus.

Slightly more than half of the large libraries contacted either had appointed or were preparing to appoint a formal group (committee, task force, etc.) to look into automated alternatives to the card catalog, prepare working papers, and ultimately make recommendations. Some committees are long range (such as Cornell's which has a target date for recommendations of 1978), and some are shorter range.

Almost without exception, the large academic libraries envision an on-line catalog as the successor to the card catalog. Few feel that there will be an interim period of a temporary alternative (printed book or more likely microimage) before the on-line catalog is available; rather, they will stick with the card catalog until the technology and economics of on-line catalogs are available. The majority feel that the physical and intellectual condition of their card catalogs is adequate to last at least until that time. Of the twenty-seven academic libraries that would suggest time frames, six (22 percent) feel an alternative catalog will be implemented within the next five years, ten (37 percent) feel it will be six to ten years, and eleven (41 percent) feel it will be longer than ten years. The majority of the first group have on-line experience through using their own or the OCLC on-line cataloging system, and few of the libraries that feel it will be more than ten years have on-line experience.

The large public libraries also feel that on-line catalogs will be the ultimate future but see a rather lengthy interim period of printed book or microimage catalogs. They cite the problems of multiple branches and heavy use by a great variety of people with varying educational/experiential levels as major deterrents to on-line catalogs for public libraries. In this way they are similar to the intermediate public libraries contacted.

The library cooperatives and service bureaus generally agree with the academic libraries that on-line catalogs will be the evolutionary step from card catalogs, not printed book or microimage catalogs. One felt it would be within five years, two felt five to ten years, and two felt longer than ten years.

The state and national libraries generally felt that book or microimage catalogs, perhaps along with on-line catalogs, would follow. Interestingly, they are generally more optimistic about the time frame with five of the seven suggesting that on-line catalogs might happen within five years and all seven suggesting six to ten years with some certainty.

Although the majority of the libraries envision an on-line catalog, they feel that some physical backup will be required in the form of a card file in title and/or shelf sequence, or printed book or microimage catalogs with at least brief entries. Further, the majority of the libraries feel automated authority control is essential.

Finally, virtually all of the large libraries contacted stated that the automated alternative to the card catalog would have to be a cooperative effort (i.e., networks). A few felt that they would support their own systems, with only cooperative record generation. However, a larger number felt that they would never be able to support their own data bases and hardware/software systems and that this would have to be supplied and supported in a networking operation.

Three of the large libraries (not included in the above summary) currently have an automated alternative to the card catalog. Unlike the intermediate libraries, where there was a variety of alternative forms of the catalog, all of the large libraries contacted that have alternatives have the same type: printed book. Two have no card catalogs, and the third has a closed card catalog and an open automated catalog.

The smallest of the three is the University of California at Santa Cruz. It has had a computer-generated printed book catalog since the library began in 1967, and in January 1975 the catalog contained approximately 250,000 titles. The book catalog is in two sections; author/title and subject with each section being recumulated every other year. Monthly cumulative supplements are produced. All computing is done locally and is batch processing; the record format is MARC compatible. Twenty copies of the catalog are produced by photocopying, and the catalog grows at the rate of approximately 20,000 titles a year. In addition to the printed book catalog, a shelf card catalog and main entry card catalog, also containing in-process records for items on-order or received but not cataloged, are maintained. An interesting cost study of the computer-generated book catalog has been completed as an internal report.[11]

The library is experiencing some difficulty with the book catalog due to its increasing size. Specifically, the cumulations are taking six months and longer to get the required twenty copies photocopied. The library has done a study of microimage (COM) and on-line alternatives and has recommended that the library go to an on-line catalog with printed book backup containing brief bibliographic data.[12] If this is funded, they hope to be operational on-line in 1976 or 1977 at the latest. Although the entire operation is now done locally, they do not rule out the possibility of a cooperative effort at a later time.

The Los Angeles County Public Library has had a computer-produced printed book catalog since 1969. Prior to that, they had printed book catalogs produced by various means including unit record equipment and photographic processing. Thus, no public card catalogs are in use and none have been in use for over twenty years. In January, the catalog contained approximately 325,000 titles and grows at the rate of approximately 15,000 titles a year. The catalog is recumulated annually and is kept up to date with cumulative supplements. The last cumulation (1974) was 30,000 pages long and was printed in 400 copies. The catalog and supplements are produced by a commercial firm (General Research Corporation, Santa Barbara, California). The pages are photocomposed, the bibliographic data is complete with extensive annotations, and the record format is non-MARC but will likely become MARC compatible in 1976.

Primarily because of cost ($325,000 in 1974/75), the library is very interested in other alternatives. They are considering alternatives to reduce the book catalog production costs including increasing the cumulation period, eliminating the annotations and/or fiction subheadings, going to a register/index arrangement, and going to microimage. Microimage seems the most promising at this point, but the library is waiting to see the performance of other microimage catalogs. Because of the size of the collection, they are particularly interested in the possibility of an ultrafiche format. Although no definite plans have been made, the library is taking steps to plan a unified approach to microimage catalogs with other libraries in the region.

The third large library visited that has a computer-generated catalog is the New York Public Library (NYPL). Both the branch libraries and the research libraries closed their public card catalogs on December 31, 1971, and initiated computer-generated printed book catalogs effective on January 1, 1972. With some exceptions (nonroman alphabets, etc.) all cataloging since 1972 is in machine-readable form and is displayed in printed book catalogs. Cataloging done prior to 1972 is available through the frozen, but still accessible, public card catalogs. A number of publications describe the reasons for this major step (primarily physical deterioration of the public card catalogs) and the printed book catalog system.[13-15]

Two book catalogs are produced. The branch libraries book catalog contained approximately 170,000 titles as of January 1975 and the research libraries approximately 220,000 titles. The branch libraries catalog grows at the annual rate of 40,000 titles and the research libraries catalog at the annual rate of 80,000 titles. Thus, in less than two years the research libraries printed book catalog will surpass in size the catalog of the Los Angeles County Public Library and in three years will more than double its present size. The computing is all batch mode and is done locally. The book catalogs are produced via photocomposition and contain complete bibliographic data; the record format is MARC compatible and the bibliographic data generally Library of Congress compatible.

When the book catalogs were started in 1972, it was thought that they would have a viable economic life of seven to ten years. Since that time, due to unanticipated increases in costs, most particularly paper costs, the viable life has been reduced to five to seven years. Within the next two to four years one or more of the following choices will be made: (1) reduce the cumulative supplements from monthly to quarterly; (2) go to an index/register approach; (3) split the catalog on the basis of subject, language, etc., and not recumulate that portion; or (4) go to microform cumulations and/or supplements. No decisions have been made, but there has been some experimentation with microimage catalogs and with COM service bureaus capable of handling diacriticals and perhaps nonroman alphabets.[16] The NYPL will have a mixture of printed book, microimage, and on-line catalogs in the future. Exclusively on-line catalogs are not acceptable to the research libraries because of the difficulty of patron use. A number of possibilities will be considered (on-line register with indexes in book form, microimage register with printed indexes, etc.), and it is possible that the branch libraries and research libraries will have different solutions. The possibilities of ultrafiche are also seriously being considered.

The Boston Public Library has accepted the results of the basic research done at the New York Public Library, and as of January 1, 1975, closed and froze its General Libraries (corresponding to the branch libraries at the NYPL) card catalogs. The General Libraries union card catalog has been revised and is being published in book form using a photographic process; the expected publication date is July 1975. New titles added to the General Libraries after January 1, 1975, and changes (updates) to the "old" catalog are being processed through a computer-based system with the intention of beginning publication of printed book catalogs (using a commercial vendor, Inforonics, Inc., Maynard, Massachusetts) later in 1975. The expected growth rate is 30,000 titles a year. In the meantime, a temporary supplementary union card catalog is being maintained for the General Libraries. A team is now revising the catalog of the Research Library with tentative plans for closing, freezing, and publishing it and continuing with computer-produced printed book catalogs sometime in the next few years.

No large libraries have microimage catalogs that replace the main public card catalog. However, two large libraries (New York State Library and the University of British Columbia) have announced a date when they plan to close their card catalogs and implement a microimage catalog and several other large libraries are seriously considering it. Two of the three large libraries (New York Public and Los Angeles County) that now have printed book catalogs are considering microimage catalogs for the short-range future. The Illinois State Library is actively doing research in microimage catalogs and the National Library of Canada has preliminary plans for maintenance of an on-line union catalog with microimage (COM) distribution throughout Canada.[17-19]

The New York State Library planned to close its main card catalog in the summer or fall of 1975 and implement a microimage (roll film) catalog. They further plan to convert brief records into machine-readable form for all titles to support the finding/locating function of the catalog, and film the closed public catalog to provide a frozen microimage retrospective catalog of the base holdings supporting the bibliographic function of the catalog. The University of British Columbia plans to begin converting to machine-readable form bibliographic data for 1975 and later imprints for creation of a COM finding list catalog beginning in September 1975. A great deal of research has been done on the data elements to be included in the microimage catalog.[20] It has been proposed, but not finally approved, that beginning with 1976 imprints cards will no longer be filed in the author/title and subject files of the public catalog. Cards for earlier imprints would continue to be filed in all files and cards for all imprints (containing full bibliographic description to support the bibliographic function of the catalog) would continue to be filed in the classed (a finding or locating catalog arranged in call number order) and shelflist files. A current survey of British Columbia needs may alter these plans.

Although no large libraries have on-line catalogs that replace the card catalog, there is a great deal of interest in this alternative. Plans at the University of California at Santa Cruz have been described above. Ohio State University hopes to stop filing cards in its card catalogs by July 4, 1976. New titles (post-1975) will be available exclusively from on-line and microimage catalogs; older titles (pre-1976) will be available in the card catalog with brief records for all older titles also available on-line by author and title. All of the titles cataloged through the OCLC system will be available in both the card catalog and the on-line and microimage catalogs, providing several years of overlap between the two major catalogs. The mechanics and costs are yet to be worked out in detail. The Ohio State University Libraries have a brief record available on-line with author/title and title access for each cataloged title in the collection showing holdings, locations, and current status (in circulation, at bindery, etc.) as a by-product of its on-line circulation system; this "catalog" can be used to support the locating or finding function of the catalog, and a limited number of terminals are available for general public use.[21, 22]

Several other large libraries have partially operational on-line systems and are in some stage of experimentation with on-line catalogs for public use; a great deal of significant work has been done at these libraries. The entire collection of Syracuse University Library is available on-line by author, title, and series—no subject access is yet available. CRT's are available throughout the building and are available for internal use and for assisting users. Terminals for public use are planned soon. Stanford University, through BALLOTS, has over 90 percent of its recently cataloged collection available from CRT terminals. The entire collection of the undergraduate library (80,000 titles) is available from both a printed book

catalog and an on-line catalog, and a few terminals are available for reference and public service use. Similarly, the University of Toronto produces a book catalog for the science library (125,000 titles) and is experimenting with an on-line partial catalog. They have almost completed their retrospective conversion and have one million machine-readable records in a non-MARC format.

Both the University of Chicago and Northwestern University have operational on-line systems. The University of Chicago is implementing a library data base system which, among other functions, will provide catalog access to titles cataloged since 1968.[23] Closing of certain departmental and area catalogs is planned as soon as possible, possibly within the next year. Northwestern University Library presently has an operational on-line technical services system. Work is under way to add "browsable" author/title and title/author indexes and provide other refinements which will permit the system to serve as a true on-line catalog for use by the public as well as library staff. By fall 1976 they expect to begin acceptability testing of user-operated terminals. If the test results are favorable and if it can be determined that the savings in technical services costs will offset the cost of the additional terminals and the increased disc storage, they expect to close their author/title card catalog by late 1977.

Both the National Library of Medicine (NLM) and the National Agricultural Library (NAL) are experimenting with on-line catalogs. The National Library of Medicine ran an experiment in parallel with continuing use of the public card catalog for a short period of time early in 1974. CRT terminals to the on-line catalog file (CATLINE; 150,000 titles) were placed in card catalog areas. Problems associated with public use of on-line terminals quickly became apparent and the experiment was discontinued. The NLM recognizes that many advantages exist for on-line catalogs and is presently searching for methods to overcome the problems associated with public accessibility to on-line data bases. The National Agricultural Library recently completed an internal study of the feasibility of closing its card catalog by January 1976 in favor of on-line access to the CAIN (Cataloging and Indexing) data base.[24] For a number of reasons, it was decided that it was not feasible to take this step by January 1976 but that a plan might be developed which would make it possible by 1980. NAL closed its dictionary card catalog in 1965 and began a new divided card catalog using AACR and LC classification. The catalogs are also available in book form, computer-generated since January 1970.

The Library of Congress has suggested the possibility of closing its card catalogs as early as 1980 and beginning on-line, printed book, and microimage catalogs from that point forward.[25] An interesting feature of their suggestion is the concept that the on-line file would be considered sufficient for all cataloging decisions (forms of entry, subject headings, etc.).

Large libraries indicate that they will consider and experiment with a variety of alternatives in terms of separating the finding and the biblio-

graphic functions of the catalog as suggested by the University of British Columbia.[26] Each function may have a different form of catalog. For example, the on-line file could be brief index records to support the finding or locating function, with complete description to support the bibliographic function available only from a card file (in shelf and/or author and/or title sequence) or a microimage or printed book catalog. Perhaps the full data will be available on-line for heavily used items while less used items might have only brief data on-line with full data off-line (microimage or printed book or card file). Perhaps the on-line system will be a cumulative supplement to a printed book (or microimage) catalog that is recumulated infrequently (perhaps every two or three or five years). Perhaps the author/title catalog will be on-line but the subject catalog will be microimage or printed book. The large libraries seem to feel that a variety of options should be explored and that heavy, but not exclusive, emphasis will be placed on on-line systems.

The vast majority of libraries have not committed their thoughts to writing up to this time. Three libraries, however, have prepared several outstanding publications which deserve special mention: the Library of Congress, the University of California/Berkeley, and the University of California/Los Angeles. These libraries have done studies of their existing card catalogs which are both fascinating and serve as excellent beginning models for other libraries that might wish to do the same.[27–32] The Library of Congress has prepared a provocative position paper on the future of catalog control in the Library of Congress.[33] The University of California/Berkeley has prepared a study of desuperimposition and the future of the catalogs in which it recommends that the card catalogs not be closed until a suitable on-line alternative is implemented, which it estimates will be in ten or more years.[34] UCLA and UCB have each written outstanding studies of alternative physical forms for library catalogs which consider technical aspects, user aspects, and major cost aspects.[35, 36] UCLA has also completed a preliminary user survey and published its recommendations for the future of the catalogs in the fall of 1975.[37]

COMMENTS AND PREDICTIONS

Several individuals expressed concern about confusion in the definition of a library catalog. Most often there was no clear understanding or statement of the definition or purpose(s) of the library catalog. The issue of the finding or locating functions of the catalog versus the collocating, coalescing, and syndetic functions was mentioned by several people. Generally, the smaller the library the more emphasis was placed on the former functions, and the larger the library the greater the emphasis on the latter. The University of Chicago defined a catalog as a file of bibliographic records that is under authority control and provides the locating and collocating functions incorporated in the Paris Principles. Thus, a file of bibliographic records, even if available on-line, which does not have careful

name and subject authority control is simply that—a file of records, not a catalog. Smaller libraries, however, seemed not to place great importance on this, and a few seemed willing to give up authority control to a significant extent. A clear understanding and statement of what a library catalog is would seem to be essential before major changes are planned.

Many libraries are thinking and planning in terms of automating the card catalog; that is, using the computer as the vehicle or carrier of the traditional card catalog with the implied assumption that no major changes or improvements were in order. A few libraries, however, stressed that the facilities of the computer are not the same as the facilities of a card catalog and that classical cataloging rules and bibliographic descriptions, designed for card catalogs, are inappropriate for automated (particularly online) catalogs of the future. A majority felt that no major changes in the bibliographic record were appropriate; a minority felt that major changes were very much needed. A majority felt that cataloging would remain essentially a human operation with some aids from the computer. A minority stressed that much of "classic" cataloging (such as assigning name and subject access points) will be done automatically through computer-structured indexes from title page information. To think in terms of automating the card catalog or the traditional cataloging functions without giving serious consideration to other possibilities for major improvements is to fall far short of what might be possible.

Related to the question of the definition and purpose(s) of library catalogs, and an integral part of it, is the question of how catalogs are used and how they might be used if they were structured and could be accessed differently. In short, what should, as well as what does, a catalog do? Many libraries mentioned this as a major unknown and a major impediment to their future planning. The majority of libraries had done no user surveys of catalog use and planned to do none; rather they were relying and planned to rely in the future on user studies done elsewhere. Lack of knowledge about how library catalogs are used (or might be used) seemed to be a major reason for making the automated catalog as nearly like the card catalog as possible on the assumption that the "new" catalog will then at least be as satisfactory as the "old" catalog, which is assumed to be at least adequate.

Although a minority of large libraries plan to implement automated alternatives to their card catalogs in the near future (within three or four years), the majority do not for several reasons. First, there is the matter of economics. Although many of the libraries acknowledge that card catalogs will eventually be replaced with a computer system because as the costs of card catalogs continue to rise and the costs of computers continue to decline, economic pressures and other factors will force libraries to switch to computer-based catalogs, they do not feel that this has yet occurred, nor do they feel it will occur before 1985. In short, while the economics of computer catalogs for large libraries may be coming, the majority of large

libraries believe the time has not yet arrived nor will it arrive for several years. Second, there is the matter of the Library of Congress. Many large libraries stated emphatically that any major change from a card catalog toward an automated catalog would and should wait for LC to take the leadership role. Many large libraries stated that the Library of Congress must determine for certain what it will do, and that other large libraries would follow. Since LC is obviously not going to be in a position to move for several years, their library would also not move. Third, and perhaps most important, several libraries mentioned the lack of significant, meaningful, or useful research in the area of automated catalogs for large libraries as a major factor in their "go slow" approach. Based on this study, there appears to be little significant research occurring at the majority of the libraries visited, and there is a noticeable lack of long-range planning, much less research, at least as represented by written documents. In light of the above and many other factors, large libraries for the most part do not intend to move too fast to close their card catalogs and implement automated alternatives in the belief that the time is not yet right.

The following predictions are based on the survey results. These predictions are for large libraries only; a different set of predictions, based on an intensive study of intermediate libraries, would be appropriate for small to intermediate-sized libraries.

1. There is considerable and growing interest among large libraries in automated alternatives to card catalogs; however, most of the serious planning is relatively recent (within the last two years). This interest will increase greatly in the next few years and will be exhibited by the creation of an increasing number of formal committees or task forces which will write an increasing number of reports.
2. Although a few more large libraries will close their card catalogs and implement alternative automated catalogs during the next decade, the majority will continue to rely on card catalogs as the primary access to the collections through at least 1985.
3. When a significant number of automated alternatives to card catalogs are implemented by large libraries, they will be done so cooperatively. The majority of large libraries will not have their own hardware/software systems and data bases. The bibliographic systems will be extremely flexible and will not be exclusively tied to any particular medium (card, book, microimage, etc.).
4. As automated alternatives are implemented, the card catalogs will be first closed and then, within five to ten years, frozen and committed to microimage through photographic processes. Large libraries will have two catalogs at least for the next twenty-five years: a frozen retrospective catalog in card or microimage form and an open ongoing catalog in machine-readable form.
5. The majority of automated alternatives to card catalogs for large libraries will be on-line catalogs, supplemented (in the sense of being

in addition to) with hard copy catalogs in card and/or microimage and/or printed book form. Exclusively printed book catalogs for large collections will not be acceptable because they are slow to appear and expensive to print and cumulate. Exclusively microimage catalogs for large collections will not be acceptable because of the user interface and acceptance problems and because they offer no significant improvement over card catalogs in improved searching capability. Because of the automated catalog's ability to be responsive to change, large libraries will be in a constant state of alternative "mixes" of on-line, hard copy, and microimage catalogs to meet changing situations, needs, and financial conditions in the future.

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3. Dr. Gerald A. Rudolph for suggesting the topic, and Mr. H. Gordon Bechanan for patiently supporting the project during my released time.

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APPENDIX A

Libraries Contacted

The following libraries and individuals were visited (V) or telephoned (T) on the dates indicated.

British Columbia. University of British Columbia Library, Vancouver. V: December 11, 1974. Basil Stuart-Stubbs, Librarian. Robin MacDonald, Assistant Librarian/Technical Services. William Watson, Assistant Librarian/Planning. J. McRee Elrod, Cataloging.

California. Aerospace Corporation Library, El Segundo (Los Angeles). T: March 24, 1975. Edythe Moore, Manager, Library Services.

California. California State Library, Sacramento. V: January 27, 1975. Gerald Newton, Chief of Technical Services. Liz Gibson, Systems Analyst.

California. IBM Library, San Jose. T: March 7, 1975. Marjorie Griffin, Library Manager.

California. Lockheed Missiles and Space Company Library, Palo Alto. T: March 19, 1975. Art Fried, Library Supervisor.

California. Los Angeles County Public Library, Los Angeles. V: January 30, 1975. Robert C. Goodwell, Chief, Technical Services.

California. Los Angeles Public Library, Los Angeles. V: January 30, 1975. Mary Fischer, Automation Coordinator.

California. Orange County Public Library, Orange. T: March 7, 1975. Harry M. Rowe, Jr., County Librarian.

California. Stanford University Libraries, Stanford. V: January 29, 1975. Allen B. Veaner, Assistant Director for Bibliographic Operations.

California. University of California, Berkeley. V: January 28, 1975. Joseph A. Rosenthal, Associate University Librarian/Technical Services. Virginia Pratt, Chairperson, Subcommittee on the Future of the Catalogs. Susan K. Martin, Head, Systems Office.

California. University of California, Los Angeles. V: January 31, 1975. Judith Corin, Assistant University Librarian.

California. University of California, Santa Cruz. V: January 29, 1975. Luke T. Howe, Head, Library Systems Office.

California. University-Wide Library Automation Program (ULAP), Berkeley. V: January 28, 1975. Jay Cunningham, Director. Brian Aveney, Manager, Bibliographic Center. Mike Berger, Associate Manager-Operations, Bibliographic Center.

Connecticut. Yale University Library, New Haven. T: March 5, 1975. David Weisbrod, Library Development Officer.

District of Columbia. Library of Congress, Washington. V: December 9, 1974. John Rather, Chief, Technical Processes Research Office. William J. Welsh, Director, Processing Department. Henriette D. Avram, Chief, MARC Development Office.

District of Columbia. National Aeronautics and Space Administration Libraries, Washington. T: March 14, 1975. Madeline Losee, Program Coordinator for Libraries.

Florida. Florida Technological University Library, Orlando. T: November 6, 1974. Lynn W. Walker, Director of Libraries.

Georgia. Georgia Institute of Technology Library, Atlanta. V: October 17, 1974. Edward Graham Roberts, Director.

Illinois. Illinois State Library, Springfield. T: March 7, 1975. Tony Miele, Assistant Director, Technical Services.

Illinois. Northwestern University Library, Evanston. V: November 7, 1974. Velma Veneziano, Library Systems Analyst. Karen Horny, Assistant University Librarian for Technical Services. Betty Furlong, Coordinator of Automation Procedures for Technical Services.

Illinois. University of Chicago Library. V: November 8, 1974. Charles Payne, Systems Development Librarian. Helen Schmierer, Library Systems Analyst. Herman Fussler, Professor, Graduate Library School.

Illinois. University of Illinois Library, Urbana. T: March 11, 1975. Robert Talmadge, Director of Technical Services.

Indiana. Indiana University Library, Bloomington. T: February 24, 1975. William J. Studer, Associate University Librarian.

Maryland. Baltimore County Public Library, Towson. T: February 25, 1975. Charles W. Robinson, Director.

Maryland. Enoch Pratt Free Library, Baltimore. T: March 4, 1975. Marian Sanner, Assistant Director.

Maryland. National Agricultural Library, Beltsville. T: March 26, 1975. Richard Farley, Director. Jeanne Holmes, Chief, Analysis Division.

Maryland. National Library of Medicine, Bethesda. T: March 17, 1975. Joseph Gantner, Head of Technical Services.

Maryland. Prince George's County Memorial Library, Hyattsville. T: February 24, 1975. Elizabeth Hage, Director. Walter Shih, Assistant Director for Datamation.

Maryland. University of Maryland Libraries, College Park. T: March 4, 1975. Walter Hamner, Assistant Director, Automation Services.

Massachusetts. Boston Public Library, Boston. T: March 19, 1975. Liam M. Kelly, Assistant Director.

Massachusetts. Harvard University Library, Cambridge. T: March 4, 1975. Colin McKirdy, Associate Librarian for Data Processing.

Massachusetts. Inforonics, Inc., Maynard. T: March 18, 1975. Larry Buckland, Head.

Massachusetts. Massachusetts Institute of Technology Libraries, Cambridge. T: March 7, 1975. Patricia Sheehan, Library Systems Designer.

Massachusetts. NELINET (New England Library Information Network), Wellesley. T: March 12, 1975. Ruth Tighe, Assistant Director.

Massachusetts. University of Massachusetts Library, Amherst. T: March 5, 1975. Richard Talbot, Director.

Michigan. University of Michigan Libraries, Ann Arbor. T: March 7, 1975. Frederick Wagman, Director.

Minnesota. Hennepin County Public Library, Edina. V: November 11, 1974. Jerry Pennington, Head, Technical Services.

Minnesota. Minneapolis Public Library, Minneapolis. T: March 11, 1975. Lillian Wallis, Head of Technical Services.

Minnesota. University of Minnesota Libraries, Minneapolis. V: November 11, 1974. Glenn Brudvig, Assistant Director for Research and Development.

Missouri. University of Missouri Libraries, Columbia. T: March 7, 1975. Dwight Tuckwood, Director.

New Jersey. Bell Telephone Laboratories Library, Murray Hill. T: March 18, 1975. W. Kenneth Lowry, Director.

New Jersey. Princeton University Library, New Haven. T: March 5, 1975. R. E. Utman, Data Processing.

New York. Columbia University Libraries, New York City. T: March 5, 1975. Jerome Yavarkovsky, Assistant University Librarian for Planning.

New York. Cornell University Libraries, Ithaca. T: February 25, 1975. Ryburn Ross, Assistant Director for Technical and Automated Services.

New York. Eastman Kodak Company Research Library, Rochester. T: March 18, 1975. Wilma Kujawski, Librarian.

New York. FAUL (Five Associated University Libraries), Syracuse. T: March 5, 1975. John Aubry, Coordinator.

New York. IBM Library, Yorktown Heights. T: March 1, 1975. Gordon Randell, Librarian.

New York. New York Public Library, New York City. V: December 10, 1974. Maurice Friedman, Head of Technical Services, Branch Libraries. Paul Fasana, Head of Preparation Services, Research Libraries. Sam Membert, Systems Analysis and Data Processing Office (SADPO).

New York. New York State Library, Albany. T: March 12, 1975. Peter Paulson, Director.

New York. Research Libraries Group, New York City. T: March 7, 1975. James E. Skipper, Executive Director.

New York. Rochester Institute of Technology Library, Rochester. T: March 12, 1975. Gary MacMillan, Director.

New York. State University of New York, Albany. T: February 25, 1975. Glyn Evans, Head of Systems Planning.

New York. State University of New York, Binghamton. T: March 18, 1975. Ron Lewis, Card Catalog Manager.

New York. Syracuse University Libraries, Syracuse. T: March 4, 1975. Gregory N. Bullard, Assistant Director for Processing and Computer Based Operations.

Ohio. Cleveland State University Libraries, Cleveland. T: March 11, 1975. Raymond Collins, Acting Director.

Ohio. Kent State University Libraries, Kent. T: March 12, 1975. Hyman Kritzer, Director.

Ohio. Ohio College Library Center, Columbus. V: October 30, 1974. Fred Kilgour, Director.

Ohio. Ohio State University Libraries, Columbus. V: October 31, 1974. Hugh C. Atkinson, Director. Betty J. Meyer, Assistant Director for Technical Services. Larry X. Besant, Assistant Director for Public Services. Bernard Bayer, Acting Head, Mechanized Information Center.

Ohio. University of Akron Libraries, Akron. T: March 7, 1975. Paul Schrank, Director.

Ohio. University of Toledo Libraries, Toledo. T: March 7, 1975. Al Hogan, Acting Director.

Oklahoma. Tulsa City-County Library. V: February 3, 1975. Ruth Blake, Head, Technical Services.

Ontario. College BiblioCentre, Don Mills (Toronto). V: January 16, 1975. Gordon H. Wright, Director. Valentina DeBruin, Manager, Bibliographic Services.

Ontario. Council of Ontario Universities. Library Cooperative System. V: January 16, 1975. Ralph E. Stierwalt, Director.

Ontario. National Library of Canada, Ottawa. V: January 17, 1975. Hope Clement, Director, Research and Planning Branch. Louis Forget, Assistant Director (Systems), Research and Planning Branch. R. Penner, Assistant Director (Systems), Public Services Branch. R. M. Duchesne, Assistant Director (Networks), Research and Planning Branch. Edwin Buchinski, Chief, Canadian MARC Office.

Ontario. University of Toronto Library, Toronto. V: January 16, 1975. Everet Minett, Director, Library Automation Systems. Jean Heathcote, Acting Manager of Operations, Library Automation Systems. Robin Braithwaite, Manager of User Services, Library Automation Systems.

Oregon. Richard Abel and Company. (Now Blackwell North America), Portland. V: December 13, 1974. John Knapp, Head, Automated Systems.

Pennsylvania. Indiana University of Pennsylvania, Indiana. T: February 25, 1975. Daniel C. Shively, Coordinator, Catalog Department.

Pennsylvania. University of Pennsylvania Libraries, Philadelphia. T: February 24, 1975. Richard DeGennaro, Director.

Texas. University of Texas, Austin. T: March 3, 1975. Vandolyn Savage, Head, Automated Systems.

Texas. University of Texas, Dallas. V: February 4, 1975. James Dodson, Librarian. Richard Meyer, Head, Technical Services.

Texas. University of Texas, Permian Basin. T: February 25, 1975. Richard Jenson, Librarian.

Texas. University of Texas, San Antonio. T: February 24, 1975. Michael Kelly, Director.

Utah. Brigham Young University Library, Provo. T: March 7, 1975. Donald Nelson, Director.

Virginia. Fairfax County Public Library, Springfield. T: February 24, 1975. William Whitesides, Director. Jay Watson, Associate Director.

Washington. King County Library System, Seattle. T: February 24, 1975. Erma Jean Morgan, Head, Technical Services.

Washington. Washington Library Network, Washington State Library, Olympia. V: December 12, 1974. Mary Jane Reed, Associate Librarian, Planning and Research. Gene Bismuti, Head, Public Services. Jackie Rudeen, Head, Technical Services.

Wisconsin. University of Wisconsin Libraries, Madison. T: March 7, 1975. Joseph Treyz, Director.

Computerized Serial Processing System at the University of California, Berkeley

Stephen M. SILBERSTEIN: University of California, Berkeley.

The extreme flexibility of the MARC format coupled with the simplicity of a batch-oriented processing system centered around a sequential master file has enabled the University of California, Berkeley, library to gradually build an unusually large serials data base in support of both technical and public services. That file has been used successfully both as the basis for an accounting system for serial expenditures and to provide increased bibliographic access to the library's collection of serials.

The University of California, Berkeley, is one of nine campuses of the University of California, with other campuses located at Los Angeles, Santa Barbara, Riverside, Davis, Irvine, San Diego, San Francisco, and Santa Cruz. The library of the Berkeley campus is one of the largest in the country with over 4,000,000 volumes housed in thirty-four separate locations. Its serials collections are regarded as particularly outstanding; the library currently receives about 30,000 document and 50,000 nondocument serials. In addition, ten independent libraries on the Berkeley campus receive another 30,000 titles. If the inactive titles are included, there are in excess of 250,000 serial titles on the Berkeley campus.

In the early 1970s a gradual program of computerization was begun in order to meet the needs of the library in providing a mechanism which could be used to gain some control over expenditures for serials (over $500,000 was being spent for serials each year) and to provide better access for library patrons to the library's large holdings of serials. Before this computerization was begun, the library administration had little information concerning what areas of the collection (e.g., physics or anthropology) were absorbing what portions of the half million dollars expended for serials. Indeed, there was no single file or listing that a librarian or a patron could consult to determine if the library had a particular serial or where that serial was located in the library system.

Constraints were: uncertainty in the campus computing situation, very limited funds, the need to deal with very large files, the need to include accounting information, and the very strong desire to use the MARC for-

mat. There was found no existing serial system that could be adapted or modified to accommodate these factors. Consequently, a system was developed at Berkeley on an evolutionary basis.

The purpose of this paper is to describe some of the features of the resulting computer processing system. It is believed that this system is an important one for several reasons:

1. At the present time, the computer serial file contains MARC-structured records in the full MARC character set for over 150,000 titles. By the end of 1975, it will contain over 200,000 titles. It is believed that this is the largest existing computerized serial file used for daily processing of serials in any library.
2. The system, while being a batch system, has an extremely flexible and powerful updating facility.
3. The system includes complete accounting for expenditures for serials. This has proven to be particularly useful due to the recent tightening of the library budget that has come about with the increased costs of serials. Invoices from major vendors are accepted in machine-readable form.
4. Regularly produced public lists, in upper- and lowercase, include lists by entry, library location, call number, and "key word." Lists produced for use by the library staff include lists by fund, serial type, vendor, order number, and computer record number.
5. The system produces, as a by-product of its updating mechanism, numerous documents used in the day-to-day technical processing of serials, thereby integrating the computer-produced public holdings lists with the regular technical processing system. These documents include:
   a. Weekly accounting reports for serial expenditures.
   b. Letters to vendors instructing them to cancel subscriptions and/or standing orders, or to send issues that have not been received ("claims").
   c. Kardex or "visible file" cards, used to record the actual receipt of incoming issues (the serials check-in system remains a manual system). These cards contain binding information for the serial and full bibliographic data.
   d. "New serial title slips" which are sent to the Serial Record Division of the Library of Congress to inform them of additions or deletions from our holdings for inclusion in the next issue of *New Serial Titles*.
6. In the near future, the system will be expanded to include computer-printed purchase orders and computer-printed catalog cards for newly cataloged titles.

CHARACTERISTICS OF THE SERIAL FILE

It was clear from the outset that little funding would be available to the

library for the conversion of the existing manual files to machine-readable form or for the development of extensive computer software to manipulate the file. Consequently, an efficient file conversion system based on optical scanning was developed.[1] In 1971–72, the first 10,000 titles were converted to machine-readable form. Thirty-five thousand additional titles were converted in 1972–73 and simple output listings were produced from the data base. In 1973–74, 100,000 more titles were included and the use of the system extended into technical processing operations. During the current fiscal year, an additional 50,000 titles will be added and all existing records will be upgraded by the addition of bibliographic notes. The computer programs allow up to 150 separate fields of any length, with the restriction that the total number of characters in the record may not exceed 7,200. The Appendix lists the data fields that are currently being used.

The basic master file in the system contains records structured in format very close to the MARC communications format, with one record for each copy of each serial in the library. Although the file is a sequential file, the records are actually in random order, chronologically by date of entry into the system. Consequently, the programming and the programs for updating records and the extraction of information from the records do not experience any of the overhead associated with more complex file organizations. The simple file organization has been a major factor in keeping programming and operating costs down. Each week approximately 2,000 of the 150,000 records are updated with an average of 1.5 updates per record. This requires four minutes of central processing unit time on an IBM 360/65 running under OS MFT, release 21.8 (this includes the time to produce the reports and other output products).

A consequence of sequential file organization is the need to completely sort the records whenever a listing of those records is required. These sorts have not proved to be exceedingly expensive on the computer that is used. For example, each month a listing of all fields in the 40,000 purchased serials is produced. The computer sort to do this requires 3.5 minutes of CPU time on the 360/65. The extraction of these records and the preparation of the sort key require 4.5 minutes.

UPDATING THE FILE

The update mechanism employed is essentially a modification of a single computer program originally developed by the University of California's Institute of Library Research as part of its BIBCON system.[2] That program has been expanded by adding numerous programs to it, each one performing a specialized function, yet each one capable of operating in a stand-alone environment. The resulting update language is called BASIC FIX. Its ability to deal with MARC records of any type is recognized by other libraries in their use of the BASIC FIX program. At the Santa Cruz campus of the university, it is used as the update program for the computer-produced book catalog system (Santa Cruz has no card catalog, but a

250,000 record MARC-structured file from which its book catalog is printed). At the San Francisco campus, BASIC FIX is used to update subject authority records which are stored in the MARC format. At the University of California's BibCenter, it is used to modify MARC records received from the Library of Congress before catalog cards are printed.

The BASIC FIX language has features that are common in most computer text editing systems (e.g., IBM's ATS), but it is rare to see these features applied in the context of updating records in a batch-processed master file, and even more rare in the case of batch-processed library files despite the fact that library files consist mostly of text. An update in the BASIC FIX language requires four elements:

1. The record number of the item to be updated (seven digits plus a modulus 11 check digit).
2. The command, i.e., the type of update to be done. Commands include *Produce* a new record for the file, *Add* data to an existing field, *Change* data in an existing field, *Delete* an existing field or part of a field, *Insert* a new field, *Eliminate* an entire record, etc.
3. The field where the operation is to be performed. Most fields are specified by giving the three-digit MARC tag. Fields contained in the fixed length 008 field are specified by giving a mnemonic, such as LANG for language.
4. The characters to be changed, added, or deleted.

For example, to correct the spelling of a title such as

The Journi of Library Automation

which appears in record 12345678, one merely writes

12345678 C245I/AL

to indicate that MARC field 245 (the title) in record 12345678 is to be changed so that "al" replaces "i". (Since complete compatibility with the keypunch is maintained, the computer programs assume that any letter punched on the keypunch is a lowercase letter unless the letter is preceded by an underscore.) The computer programs automatically expand or contract the field to perform the change. To add data to a field one merely gives the character(s) after which the data are to be added, and the characters to be added. For example, to add the word *part* after the period in the title

The Journal of Physics. 2

one writes

23456789 A245./ _PART

An entire field may be inserted into a record by giving the MARC tag of the field and the data to be placed in the field, e.g.,

34567890 I500 _TRANSLATION of _RADIOKHIMIJA

A powerful feature of the BASIC FIX language when applied to serials in a library practicing successive entry cataloging is its ability to automatically create a record for the new title when the old title is updated. With

this process, data that are common to the old and new record are automatically copied from the old record to the new one. The keyboarder inserts into the superseded title a note (MARC field 785) indicating that it is superseded by a new title, together with the call number and other additional information that applies to the new title. The BASIC FIX programs then place that note in the superseded record and create a new record for the new title. That new record will have placed in it a MARC field 780 linking it to the old record.

UPDATING THE FILE FOR SERIAL EXPENDITURES

Payments for serials are inserted in the record with the BASIC FIX update language by giving them the MARC tag 998. Although old payments will at some point be removed from the records, they have not yet been purged; some records already contain more than sixty separate payments. Each payment is entered with its amount (in any of over eighty currencies), discount, shipping charge, service charge, tax, the invoice number and date, the date upon which the payment was approved, the initials of the person approving the amount, and the pieces paid for. Previously, this information was entered into the file by having the bill payer fill out a coding sheet which was then keypunched. Presently, the bill payer keys the information directly from the invoice into a Datapoint 2200 data entry device where it is recorded on a magnetic tape cassette. At the end of the week, all cassettes are copied onto a reel of standard one-half-inch computer tape for submission to the batch programs that update the file on the IBM 360 computer.

In order to aid the bill payer in determining whether or not to approve a particular item on an invoice, each month a computer printout is produced that lists all purchased titles and all payments that have been made against those titles (see Figure 1). Thus, the bill payer can readily determine whether the invoice in hand is a duplicate of a previously paid invoice or whether the amount of the bill is substantially different from the previous bill.

Bill payers "specialize" by dealing with only certain vendors, and the payment printouts are produced in separate alphabets for each bill payer. When an employee leaves or joins the serial payment division, or whenever the division wishes to reorganize its work, the computer tables that determine which vendors to give each bill payer are changed.

Invoices from the library's major dealer for domestic serials, F. W. Faxon & Co., and from the library's major dealer for Germanic material, Otto Harrassowitz, are received in machine-readable form (punched cards) in addition to the regular printed invoice. This process completely eliminates the need for the bill payer to transcribe or key information from those invoices. Furthermore, since those vendors carry in their files the Berkeley computer record number for each copy of each serial ordered by Berkeley, there are no problems caused by the Berkeley library catalog-

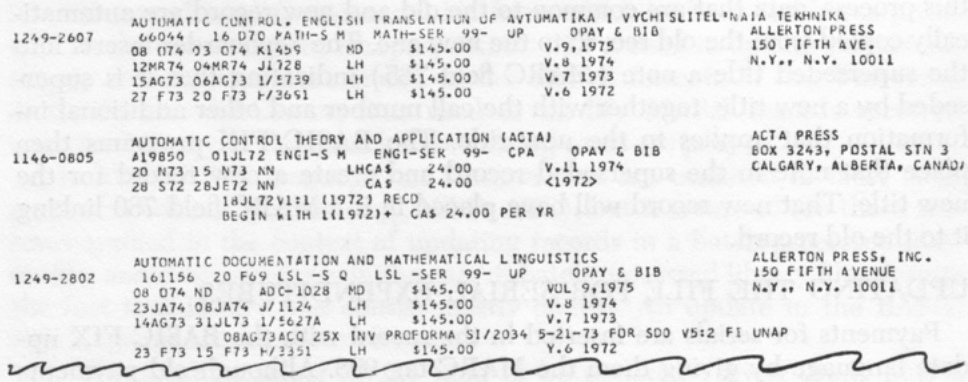

Fig. 1. Listing of All Purchased Titles and All Payments Made Against Those Titles.

ing the serial under one entry and the vendor citing that serial on the invoice by an entirely different entry. Over 5,000 serials are presently handled via machine-readable invoices.

Since the computer posts the machine-readable invoice directly to our files, the bill payer reviews the invoice after it has been paid. If it is felt that the library has been incorrectly charged for an item, a credit is requested from the vendor. In order to aid the bill payer in spotting possible incorrectly billed items, the computer prints warning messages for payments that appear to be duplicates, payments for canceled or inactive items, payments for items that are recorded as gifts and payments whose amounts are larger than a certain threshold value.

Once a month each bill payer receives notification from the computer of invoices that should be claimed, either because the item has been on order for an extended period of time or because the bill payer requested such notification when he or she approved the previous invoice for this item. For example, when approving an invoice for a newspaper subscription that covers three months, the bill payer may request notification in three months to claim another invoice, unless it has arrived in the interim.

An important aspect of including payment information in a computer serial file is the need to link records that are related to each other financially, in addition to the linking of records that are related bibliographically. For example, the library often receives a wide variety of distinct publications as the result of membership in an organization. Consequently, the serial file must contain records for those memberships and the publications received as perquisites, in addition to the bibliographic records for the publications themselves, which must indicate what organization sends the publication. Bill payers are directed to pay only for the membership and not for the publication.

ACCOUNTING AND MANAGEMENT REPORTS FOR SERIALS EXPENDITURES

A by-product of updating the UCB MARC serial file with all expenditures

UNIVERSITY OF CALIFORNIA, BERKELEY LIBRARY SERIAL PAYMENTS APPROVED REPORT FOR THE ED-P-S FUND 75133 MAY 3-9, 1975

********** PREVIOUS ACTIVITY **********

ED-P-S	136.04	NOV. 9-29, 1974 , 197	1
ED-P-S	117.92	74343 NOV. 30-DEC. 6, 197	
ED-P-S	$774.19	74395 DEC 7- DEC 17, 1974	
ED-P-S	$61C.98	75011 JAN. 1-10, 1975	
ED-P-S	$656.54	75017 JAN. 11-17, 1975	

********** CURRENT ACTIVITY **********

FUND	BRANCH	VENDOR	INVOICE DATE	G	NO.	AMOUNT	TITLE	COVERAGE	RECORD NO.
ED-P-S	ED-P	99A8	08AP75	2284442	R	$1.50	ANNUAL REGISTER OF GRANT SUPPORT	SHIP	1228340X
ED-P-S	ED-P	99A8	08AP75	2284442	M	$47.50	ANNUAL REGISTER OF GRANT SUPPORT	1974/75	1228340X
ED-P-S	ED-P	99G8	12MR75	NN	M	$14.62	EDUCATIONAL PLANNING TORONTO	VOL1	17757264
ED-P-S	ED-P	9988	23AP75	NN	M	$3.00	JOURNAL OF COOPERATIVE EDUCATION	1YR (1975)	10610200
ED-P-S	ED-P	C62G	21MR75	S4833G	R	.82	MONUMENTA PAEDAGOGICA	SHIP	11671804

Fig. 2. Weekly Listing of Serial Expenditures, by Fund.

for serials and standing orders is a system which issues reports that contain cataloging quality bibliographic information as well as accounting data. For example, at the present time the system prints a weekly report for each serial fund, listing all expenditures made from that fund the previous week, title by title. In addition, the report lists all expenditures made for all previous weeks, week by week, so that the manager of the fund may gain an idea of the expenditure pattern over time. Figure 2 is an illustration of such a report.

The fund accounting scheme currently used by Berkeley is based on the division of the collection into areas both by subject and by language. Each copy of each serial is assigned to one area of the collection for which a librarian is responsible. That librarian receives the weekly reports so that he or she may maintain contact with the activity of serials in his or her area of responsibility.

In addition to the weekly reports, the system is capable of producing on-demand listings of all titles in a particular fund, arranged by either entry, call number, or cost, displaying the amounts paid for those titles year by year. Librarians use these reports in order to ascertain the pattern of serial price increases. Figure 3 is an illustration of this type of report. (Payments recorded under the old manual system are not shown in these reports.)

Due to the rapidly increasing prices for serials and budget difficulties, the library unfortunately has, at times, found itself in the position where its cancellations must equal, in dollar terms, its orders for new serials. This

DETAILED LISTINGS FISCAL HISTORY 741218

BIOL-S ENTRY		74-75	#	73-74	#	72-73	#	71-72	#
Acta Anatomica	11556006	$.00		$209.97	1	$.00		$.00	
American Chemical Society. Journal	10045508	$66.00	1	$.00		$66.00	1	$.00	
American Journal of Physiology	10061708	$75.00	1	$.00		$60.00	1	$.00	
American Journal of Veterinary Research	10063900	$30.00	1	$.00		$30.00	1	$.00	
American Veterinary Medical Association. Journ	10083108	$30.00	1	$.00		$30.00	1	$.00	
Archiv fur die Gesamte Virusforschung	10124408	$.00		$534.74	3	$243.04	3	$191.24	3
Archives of Oral Biology	10129406	$.00		$193.25	1	$.00		$.00	
Beitrage zur Pathologie	10176901	$214.61	1	$185.46	1	$107.60	2	$102.37	2
Berichte Biochemie und Biologie	10178715	$498.32	2	$1,683.61	3	$1,265.35	7	$187.97	1
Berichte Physiologie, Physiologische Chemie un	12575008	$.00		$812.94	3	$62.66	1	$.00	
Biochemical Journal	10191306	$.00		$268.99	2	$175.63	2	$.00	
Biochemical Pharmacology	10191902	$.00		$260.47	1	$.00		$.00	
Biochimica et Biophysica Acta	10192797	$1,551.20	1	$74.86	1	$1,132.06	2	$736.65	2

Fig. 3. Listing of All Titles in the Biology-Serials Fund, Showing Serial Expenditures Over Time.

rule is applied equally to all serial funds. Consequently, the librarian in charge of each serial fund receives each month a list of all serials ordered during the current fiscal year with both actual and estimated expenditures for those titles. Figure 4 is an example of that report. This is used in conjunction with a cancellation report, in the same format as Figure 2, but listing only cancelled items and the computer-estimated savings (based on previous expenditures). In this manner the library is able to monitor quite successfully its serial expenditures.

OUTPUT SYSTEM FOR BIBLIOGRAPHIC INFORMATION

In addition to the accounting and management reports described above, the serial system is able to produce a variety of listings containing any or all of the bibliographic information in the record. These listings are produced by a subsystem called the "key" system. Almost any field or part of a field in the record may be used as the data element by which the listing is to be sequenced. The variables that control the generation of the sort key and the fields to be printed are input at run time via a special control file that is read by the computer programs.[3] Certain commonly used formats, such as edit listings, main entry listings, keyword listings, and listings by library location, may be specified by providing as little as one character of control information. The key system will be described in a separate paper.[4] Figure 4 is a sample page from the current edition of the *Berkeley Serials Key Word Index.*

In order to make such flexibility possible, there are no alphabetizing numbers or sort fields buried (carried) in the records.[5, 6] Any field may be used for this purpose. The computer programs contain logic to insure that the resultant filing approaches ALA standards. This technique further simplifies file maintenance and update procedures, since a minor modification in any field, such as the main entry, does not require change in any alphabetizing number or sort field.

Besides the *Index,* standard listings produced include listings by main entry, call number, type of serial, mode of receipt, library location, order number, vendor, cost, etc. The two most frequently produced lists, one by computer record number and one by entry, are produced on 48X microfiche using a special set of computer programs that are designed to achieve rapid processing speeds through the computer. For example, both of those lists, each containing in excess of 150,000 items, require less than five minutes of central processing unit time on a 360/65. These special listing programs do not offer all of the options that the "key" system does, yet the "key" system itself is fully capable of processing 2,000 records a minute, including all sorting.[7]

ADDITIONAL OUTPUT PRODUCTS OF THE SYSTEM

It is the philosophy of the library to use the computer serial file in as many ways as possible to aid the technical processing of serials. When a

AUTOMATIZACIJA Serials Key Word Index, 1974 University of California - Berkeley - General Library Page 590
CALL NUMBER HOLDINGS

AUTOMATIZACIJA (cont.)
TJ212.M381 ENGI Mehanizacaija , AUTOMATIZACIJA: Hidraulika, Pneumatika, Elektromehanikam Elktronika, Automatika.1, 1967-

AUTOMATIZACIJI
TK7801.J84 MAIN Jugoslovenska Konferencija o Elektronici, Telekomunikacijama, AUTOMATIZACIJI i Nuklearnoj Tehnici. Zbornik Materijala. 3, 1958; 10, 1965-

AUTOMATYKA
TJ225.G55A8 MAIN Gliwice. Politechnika Slaska. AUTOMATYKA. 1, 1961; 3, 1963-

AUTOMATYKI
TJ212.A7 ENGI Archiwum AUTOMATYKI i Telemechaniki. 1, 1956-

AUTOMEDICA
C UCSF AUTOMEDICA. 1, 1974-

AUTOMNE
LA417.A2A3.F3 MAIN Canada. Bureau of Statistics. Fall Enirolment in Unversities and Colleges. Inscriptions d'AUTOMNE aux Universites et Colleges. . . . . 1953/54- [Latest:DOCU]

Fig. 4. Berkeley Serials Key Word Index.

record in the computer file has its status changed from "on order" to "active," the computer automatically produces a "Kardex" card for use in checking in the issues of the serial. Such a card is also automatically produced for the succeeding title when a "superseded by" note is inserted in a record. These serial check-in cards include binding information. Cards can also be produced by specifying the computer number of the serial for which a card is desired. Figure 5 shows one of these cards.

In the same manner, the computer automatically generates reports which are sent to the Serial Record Division of the Library of Congress for use in updating *New Serial Titles.* These reports are generated automatically, both at the time a serial is first received and when the computer is informed that it has become inactive.

Recently, due to budgetary constraints, Berkeley had to cancel about

Copy 14 13 12 11 10 9 8 7 6 5 4 3 2 1

GREAT BRITAIN. HISTORICAL MANUSCRIPTS COMMISSION
ACCESSIONS TO REPOSITORIES AND REPORT ADDED TO THE NATIONAL REGISTER OF ARCHIVES

DA
23
G75

CONTINUES GREAT BRITAIN. NATIONAL REGISTER OF ARCHIVES. LIST OF ACCESSIONS TO REPOSITORIES--3144690

1971-

DOCS

9341 98

SERIES 10A 25M 2/73

RECORD NO. | ORDER NO. | ORDER DATE | FUND | RCV | CITY | LANG. | FG | I S S N
3144-6917 | 0 11061 | ND | DOCS-S | DOC | 02 | EN | ENG | AF | PR

GREAT BRITAIN. HISTORICAL MANUSCRIPTS COMMISSION

Fig. 5. Sample Computer-Produced Serial Check-in Card.

UNIVERSITY OF CALIFORNIA, BERKELEY

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THE GENERAL LIBRARY — BERKELEY, CALIFORNIA 94720

JUNE 14, 1974

OTTO HARRASSOWITZ
P.O.BOX 349
TAUNUSSTRASSE 5
6200 WIESBADEN, GERMANY

Please cancel our subscription(s) and/or standing order(s) for the items listed below:

ENTRY	ORDER #	U.C.B. COMPUTER RECORD #	CANCEL	ISSUES NOW MAILED TO
Luftfahrttechnik, Raumfahrttechnik	60996	10715502	ON EXPIRATION	SERIALS DEPT.
Musica Calendar	122535	11379601	IMMEDIATELY	SERIALS DEPT.
Musica Divina. Kirchenmusikalische Werke fur Praxis und Forschung	82797	11695900	IMMEDIATELY	SERIALS DEPT.
Musik	47762	11698007	ON EXPIRATION	SERIALS DEPT.

Fig. 6. Sample Computer-Produced Cancellation Letter.

3,000 serial subscriptions. At that point, computer programs were added to the system to print letters to vendors requesting cancellation (see Figure 6). In July 1975, this facility expanded to include letters to vendors to claim missing issues. These claims (see Figure 7), like cancellations, are initiated by a member of the library staff issuing a command to the computer.

It is anticipated that in the near future, the output products produced by the system will be expanded to include computer printed work sheets for catalogers to be used in cataloging uncataloged items that are in the computer file, the catalog cards themselves, and the purchase orders for newly ordered serials.

CONCLUSION

The University of California at Berkeley has gradually built a MARC-structured serial file containing 200,000 records while utilizing that file to gain control over serial expenditures and to increase access to the library's collections. At the same time, the data base has been put to use in the daily operations of serial processing in the library. It is expected that the growth of the system will continue, benefiting both the Berkeley library and its users.

DORA HOOD'S BOOK ROOM
34 ROSS ST
TORONTO, ONTARIO
CANADA M5T 1Z9

UNIVERSITY OF CALIFORNIA
BERKELEY
OCTOBER 13, 1975

Gentlemen:
Estimados Señores:
Messieurs:

MONTREAL. UNIVERSITE. INSTITUT D'ETUDES MEDIEVALES
CONFERENCE ALBERT-LE-GRAND
1972+

[X] has not been received.
no se ha recibido hasta la fecha.
ne nous est pas parvenu.

[ ] was damaged in the mail/is an imperfect copy.
ha sido dañado en el correo/es copia imperfecta e inaceptable.
a été endommagé dans le courrier/est un exemplaire défectueux.

[ ] has been lost from the library; we will pay replacement bill.
ha sido perdido; remitiremos pago por su reemplazo.
est perdu; nous accepterions de payer pour un remplacement.

ORDER # 150665 RECORD # 11665506 MAIN

No reply is needed if the material can be sent without delay. If this is not possible, please indicate the reason on the reverse side of this letter and return it to us.

Ninguna contestación es necesaria sí tal material puede ser enviado sin demora. En caso no ser posible, favor de llenar al reverso de la pagina y devolverla a nosotros.

Aucune réponse n'est nécessaire si vous pouvez nous l'envoyer sans délai; dans le cas contraire veuillez nous retourner la présente avec votre réponse au verso.

Very truly yours,
Muy atentamente,
Très sincèrement votre,

SERIALS DEPARTMENT
GENERAL LIBRARY
UNIVERSITY OF CALIFORNIA, BERKELEY
BERKELEY, CALIFORNIA, USA 94720

SER 7 - 15M - 6/75

Fig. 7. Serial Claim Form.

The computer system continues to grow in an evolutionary manner, both in the extent of its coverage (number of titles) and depth of coverage (data elements contained in the file and variety of output products). It is anticipated that computer programs to print purchase orders for new serials and to print catalog cards for newly cataloged serials will be added in the near future.

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2. Liz Gibson, "BIBCON—A General Purpose Software System for MARC-Based Book Catalog Production," *Journal of Library Automation* 6:237–56 (December 1973).
3. See John C. Rather and Jerry G. Pennington, "The MARC Sort Program," *Journal of Library Automation* 2:125–38 (September 1969), for a discussion of the concept of a sort key and its creation at the time the sort program is run.
4. Walt Crawford, "Building a Serials Key Word Index," *Journal of Library Automation* (March 1976, forthcoming).
5. It is interesting to note that even many sophisticated on-line serials systems contain alphabetizing numbers. See, for example, Rosario de Varennes, "On-Line Serials System at Laval University Library," *Journal of Library Automation* 3:128–41 (June 1970). The on-line UCLA Biomedical Library serials system also requires an alphabetizing number.
6. The Minnesota Union List of Serials has a sort field, designated by MARC tag 249, which may be up to 120 characters long, that is used for sorting. Other systems use symbols in the regular main entry field to designate the characters to be used for sorting and those to be used for printing.
7. Susan K. Martin, "Mixed Media for a Serial System: Hardcopy, Microform, and CRT's," in *Information Roundup;* Papers Presented at 4th ASIS Mid-Year Meeting, Portland, Oregon, May 15–17, 1975 (Washington, D.C.: ASIS, 1975).

APPENDIX

Data Fields Presently in Berkeley Computer Serial File

I. Codes of Various Types (All Except Record Number and Record Type Are Stored in an Expanded 008 Field)
   1. Computer record number (includes a modulus 11 check digit)
   2. Record type (e.g., gift, exchange, purchase, inactive)
   3. Date ordered
   4. Beginning date of publication
   5. Ending date of publication
   6. Country of publication
   7. Language
   8. Frequency
   9. Fund to be charged for serial expenditures for this copy of this serial
   10. Type of governmental body, if a document
   11. International Standard Serial Number
   12. Physical medium (e.g., microfilm)
   13. Type of serial (e.g., newspaper, periodical, monographic series, etc.)
   14. Type of order (e.g., subscription, standing order, etc.)

15. Order number
16. Library location where the item is shelved
17. Library location where the item is received (i.e., mailing address)
18. Vendor or exchange partner code (if the vendor is infrequently used, the entire address is carried in the record—in MARC field 265—instead of carrying a code that points to the address in the vendor file)
19. Type of analyzing done for this serial
20. Bindery type (e.g., quarter bind)
21. Binding designation (e.g., volume, year, etc.)
22. Color of binding

II. MARC Variable Length Fields

1. Call number (090)
2. Author (110)
3. Title (245)
4. Edition (250)
5. Imprint (260)
6. Publisher's address (265)
7. General public notes (500), including the following types of notes:
   a. title varies
   b. cover title
   c. issued by
   d. successively issued by
   e. also cited as
   f. absorbed by
   g. absorbed
   h. merged with
   i. translation of
   j. bound with
   k. inclusion of indexes, supplements, etc.
8. Circulation note (506) (e.g., "noncirculating")
9. Internal note (590) (e.g., number of deposit account from which this serial is paid, if a U.S. document)
10. Agency added entry (747)
11. Name of series which this item is a subseries of (760)
12. Name of subseries of this series (762)
13. Preceding serial (continues, continues in part, supersedes, supersedes in part) (780)
14. Succeeding serial (785) (continued by, continued in part by, superseded by, superseded in part by)
15. Library holdings (850)
16. Record of correspondence of all letters written to vendor concerning this serial (990)
17. Special payments (995) (e.g., for replacement issues)
18. Regular payments (998) (includes payment date, invoice date, invoice number, initials of person approving payment, currency, amount, discount or additional charges, pieces paid for, invoice claiming date, etc.)

COM Catalog Based on OCLC Records

Richard W. MEYER: University of Texas at Dallas, and John F. KNAPP: Research Libraries Group, Branford, Conn. At the time the article was written, Mr. Knapp was with Blackwell North America, Inc.

The production of a COM catalog using OCLC records on magnetic tape is outlined. Standards developed within the library community as represented in the MARC format have made this catalog possible. A brief overview of the procedures involved and of the catalog is presented.

INTRODUCTION

This article reports on the successful use of currently available computer technology in support of cataloging and processing at the University of Texas at Dallas. The experience at UT-Dallas suggests to libraries interested in seeking alternatives to the card catalog that there are options open to them in developing and maintaining a machine-readable data base without requiring local access to a computer and systems staff.

The UT-Dallas Library is maintaining its catalog on data bases in two remote locations and integrating these records regularly to produce a microfiche catalog for its patrons. The bibliographic data communications between two cataloging centers—Ohio College Library Center (OCLC) and Blackwell North America (formerly Richard Abel and Company)—using the MARC format as the medium of exchange are described below.

BACKGROUND

Under arrangements with the three new campuses of the University of Texas located in Dallas, San Antonio, and the Permian Basin, Richard Abel and Company developed a set of computer programs which maintain a machine-readable data base and produce catalogs in a variety of formats. Using the same software, catalogs can be produced on a computer line printer, on a COM device, or on photocomposition equipment. The records may be combined to produce either dictionary or divided catalogs. To date, the system has been used for the three University of Texas libraries to produce catalogs on microfiche and microfilm using COM technology. UT-Dallas is currently undertaking to install this batch software system on its local computer facility; however, in the meantime, the system is being maintained by Blackwell North America (B/NA).

Initially for its current acquisitions, UT-Dallas developed its biblio-

graphic data base by using Abel cataloging services, which included the production of catalog cards and labels and the retention of a machine-readable record in the MARC format. Retrospective cataloging for the library was concurrently converted by systematically working through its shelflist, at that time containing 12,000 titles. Cataloging was ordered from Abel by LC card number for 1969 and later imprints. For titles with imprints earlier than 1969, the library searched the Abel data base title index and ordered those found by Abel record number. For those titles not found on the Abel data base, the shelflist card was photocopied, and the copy was sent to Abel to be keyed and converted to machine-readable form. This 12,000 title collection consisted of mostly English-language books with emphasis in science and technology. The current and retrospective records were merged into a separately identified UT-Dallas cataloging data base, which now contains records for approximately 48,000 titles growing at a rate of 20,000 titles per year. Similar procedures were used to assemble cataloging files for the other two campuses.

In 1973, when it became apparent that UT-Dallas would be joining the Ohio College Library Center network under the aegis of the Inter-University Council of North Texas (IUC), it was conjectured that the OCLC terminals could be used to support current cataloging activities and that OCLC records on tape could be added to the UT-Dallas data base maintained by Abel. Since both centers use the MARC data definition and can produce records in the MARC structure, would it be possible to keep records from both sources on a single file? In practice, this is essentially what happened.

SYSTEM OPERATION

All present cataloging operations at UT-Dallas are centered around production of catalog copy via the UT-Dallas link to OCLC. Current imprints as well as retrospective titles and continuing shelflist conversion of a recently purchased library collection are processed routinely with a pair of CRT terminals in the manner used by many libraries linked with OCLC. Each title is searched in the OCLC data base prior to ordering as a preorder bibliographic check and if not found is searched again subsequent to receipt. When the search or re-search is made with book in hand and the corresponding OCLC catalog record is located, copy is produced immediately if no significant bibliographic editing is required. When significant editing or original cataloging is needed, a work sheet is prepared by the cataloging staff. The data are then entered into the OCLC data base using a terminal and catalog copy is produced.

Because UT-Dallas relies on a microfiche catalog, only two catalog cards are produced by OCLC—one for the card shelflist which continues to be maintained and one for a temporary title catalog, which was intended to provide access to recently cataloged books between supplements to the microfiche catalog. However, the latter file has been discontinued since

B/NA has started biweekly supplementation to the catalog. UT-Dallas currently uses the second card as a feedback card for error correction when necessary and discards the rest. OCLC maintains an archival record of all catalog production which includes any local modifications made to the basic bibliographic records, e.g., added notes and call numbers. The only significant difference between these records and those supplied by the Library of Congress MARC Distribution Service is that OCLC uses the 001 field for its own record number and puts LC card number in the 010 field (which is according to specification in the MARC format).[1] The UT-Dallas archival file is written onto magnetic tape in the ASCII character set and sent from Columbus to Dallas biweekly.

When the tape arrives, the records are processed on a local computer to prepare a tape to be sent to B/NA. This processing consists primarily of error checking and conversion to an EBCDIC character set. For example, the presence of an 050 or 090 field is checked to assure that there is a call number in the record. In addition, the OCLC record number is moved into a fixed field position, and the records are sorted to insure that they are arranged in ascending record number order (they arrive from OCLC unsorted).

When the records are received by B/NA in Portland, they are added to the UT-Dallas data base. In addition to OCLC records, records for nonmonographic cataloging produced by the UT-Dallas cataloging staff and sent to B/NA for conversion and inclusion (as with OCLC production two main entry cards are produced) are merged into the data base. These new records plus any older records which might have been modified (e.g., a change of call number or location) appear on a biweekly cumulating catalog supplement on microfiche which supports a yearly master cumulation of the catalog. Therefore, in actual use, the patron is required to search no more than two catalog alphabets. The biweekly production schedule appears to be an adequate compromise between keeping the catalog up-to-date and the cost of frequent catalog production. It is interesting to note that an economic biweekly supplementation schedule can be maintained with a COM catalog; this has not usually been possible with printed book catalogs. The average time delay between the production of the cataloging at the terminal and the appearance of those records in the catalog is eight weeks, which compares favorably with typical card production and filing schedules in most medium-sized academic libraries.

UT-Dallas has divided its microfiche catalog into author, title, subject, and shelflist arrangements. This division seems to be in line with current trends and follows the practice formerly used in the card catalog. Within the four divisions, several different approaches to the display of the data are used. Selection of the page formats and the content of each catalog entry were based on an analysis of search strategy and on a user survey. The first catalog cumulation was produced in a variety of formats with differing content, and a survey of user experience with this catalog was

used as a basis for format selection in future catalogs.

The author catalog (Figure 1) contains very brief entries which consist of author, title statement, date of publication, and call number. This catalog is viewed only as a finding list by author. For detailed information or citation verification, the user is required to access the title catalog.

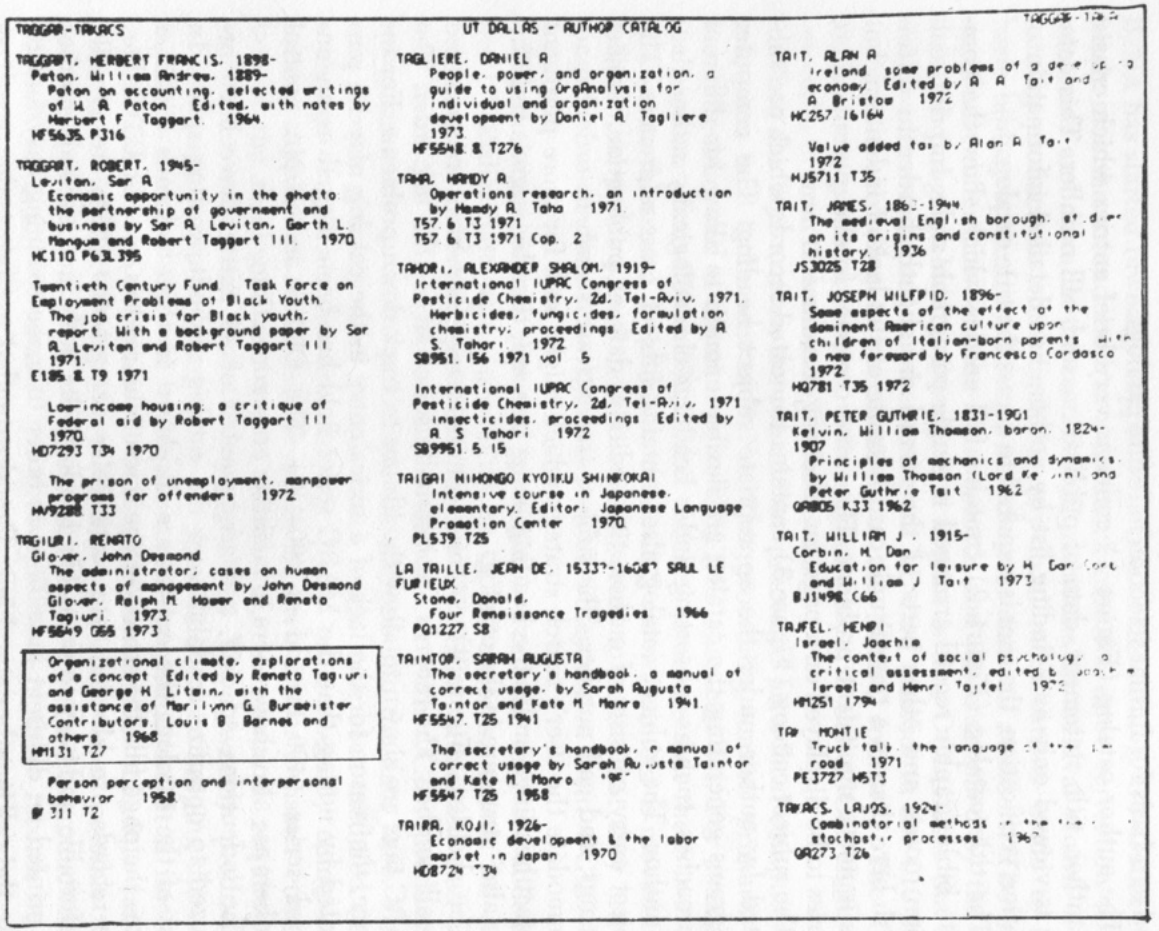
The title catalog (Figure 2) contains full entries which show the complete bibliographic record arranged in single paragraph style. Imprint, collation, notes, and other parts of the record are slightly harder to distinguish here than in a typical unit card because of the lack of indention, but this is not a significant problem. The more compact format permits more entries to be displayed on a page, an offsetting user benefit.

The subject catalog (Figure 3) contains truncated records which are subsorted by author under the appropriate subject heading. The computer programs generating the catalog are flexible enough to allow for different approaches, such as subsorting under headings chronologically rather than by author. The subject catalog also contains subject cross-references. The subject entry consists of author, title, edition, date of publication, subject tracings, and call number. The subject tracings are shown in order to accommodate the user's search strategy which might look for more pertinent subject headings under the heading being perused, thereby augmenting the "see also" structure in the catalog.

The shelflist (Figure 4) contains complete records which are arranged by call number. The records are internally sorted in MARC tag order. The MARC tags are shown to allow the library to track down problems. For instance, the reason for the lack of a series entry in the catalog may be pinpointed by noting that the MARC series field has been tagged as an untraced series (490 instead of 400-440). The OCLC and B/NA control numbers are also shown here to facilitate error correction.

The indentions, spacing, and arrangement of all entries have been organized to optimize readability of the catalog without wasting space. In most of the catalogs the entries are displayed in three columns within a page—the page fills the screen of the microfiche readers used at UT-Dallas. The records are blocked into rectangular paragraphs which are visually comfortable and easy to scan. The heading, the body, and the call number are printed on different indentions in order to make scanning easy and to make the call number stand out. Should extended use prove the page layout or the entry format and contents to be ineffective, simple tables driving the computer program logic can be altered to allow alternatives without modifying the programs themselves.

As mentioned above, the subject catalog contains a full cross-reference structure. This structure includes all the relevant see references and see also references (with blind see also's eliminated) found in the *Subject Headings Used in the Dictionary Catalogs of the Library of Congress*, 7th edition.[2] The provision of cross-references is one feature of the batch processing system which includes subject authority control. The authority file



TAGGAR-TAKACS UT DALLAS - AUTHOR CATALOG TAGGAR-TAK 2

TAGGART, HERBERT FRANCIS, 1898-
Paton, William Andrew, 1889-
Paton on accounting, selected writings of W. A. Paton. Edited, with notes by Herbert F. Taggart. 1964.
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Economic opportunity in the ghetto: the partnership of government and business by Sar A. Levitan, Garth L. Mangum and Robert Taggart III. 1970.
HC110.P63L395

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LA TAILLE, JEAN DE, 1533?-1608? SAUL LE FURIEUX
Stone, Donald.
Four Renaissance Tragedies. 1966.
PQ1227.S8

TAINTOR, SARAH AUGUSTA
The secretary's handbook, a manual of correct usage, by Sarah Augusta Taintor and Kate M. Monro. 1941.
HF5547.T25 1941

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Economic development & the labor market in Japan. 1970.
HD8724.T34

TAIT, ALAN A.
Ireland; some problems of a developing economy. Edited by A. A. Tait and A. Bristow. 1972.
HC257.I6I64

Value added tax, by Alan A. Tait. 1972.
HJ5711.T35

TAIT, JAMES, 1863-1944
The medieval English borough, studies on its origins and constitutional history. 1936.
JS3025.T28

TAIT, JOSEPH WILFRID, 1896-
Some aspects of the effect of the dominant American culture upon children of Italian-born parents. With a new foreword by Francesco Cordasco. 1972.
HQ781.T35 1972

TAIT, PETER GUTHRIE, 1831-1901
Kelvin, William Thomson, baron, 1824-1907
Principles of mechanics and dynamics, by William Thomson (Lord Kelvin) and Peter Guthrie Tait. 1962.
QA805.K33 1962

TAIT, WILLIAM J., 1915-
Corbin, H. Dan
Education for leisure by H. Dan Corbin and William J. Tait. 1973.
BJ1498.C66

TAJFEL, HENRI
Israel, Joachim
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HM1251.I794

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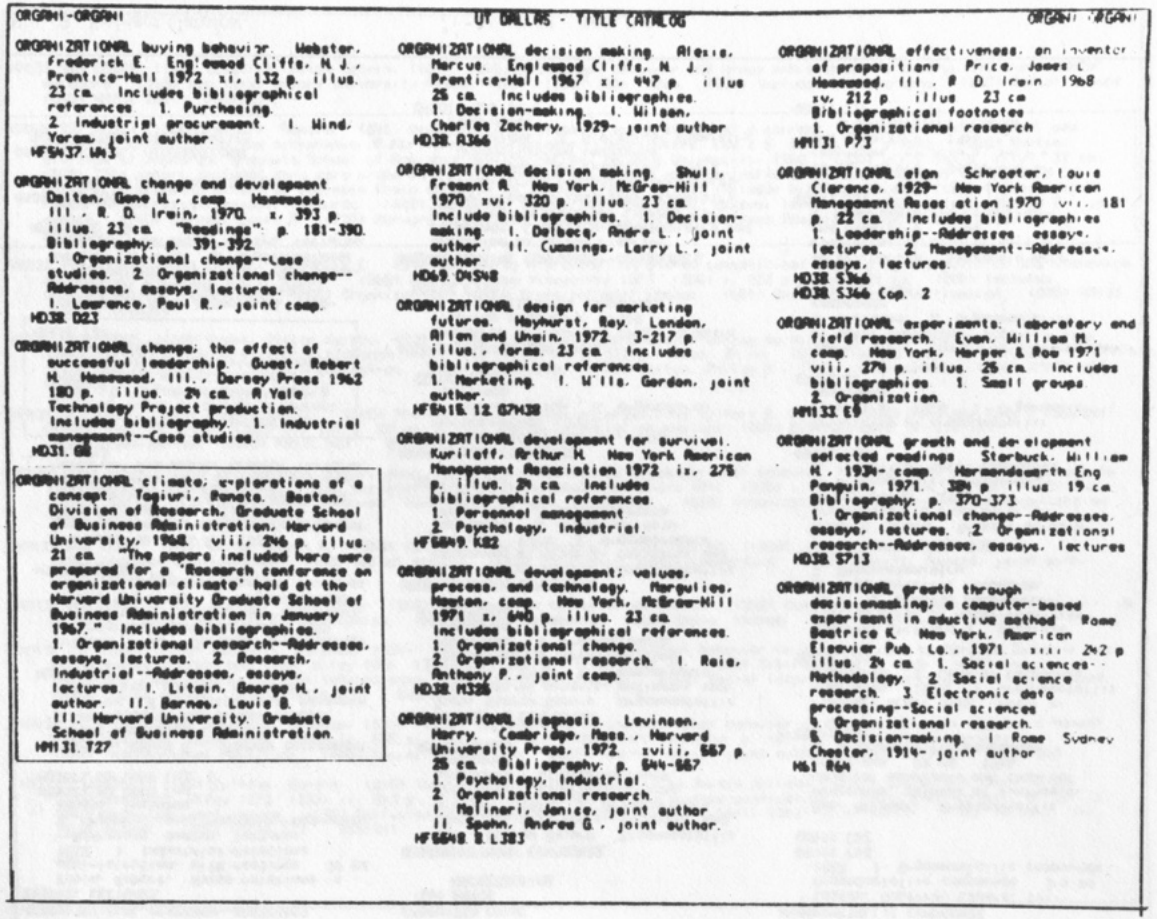
PE3727.H5T3

TAKACS, LAJOS, 1924-
Combinatorial methods in the theory of stochastic processes. 1967.
QA273.T26

Fig. 1. Author Catalog.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ORGANIZATIONAL diagnosis. Levinson, Harry. Cambridge, Mass., Harvard University Press, 1972. xviii, 567 p. 25 cm. Bibliography: p. 544-567 1. Psychology, Industrial. 2. Organizational research. I. Molinari, Janice, joint author. II. Spohn, Andrew G., joint author. HF5548.8.L383

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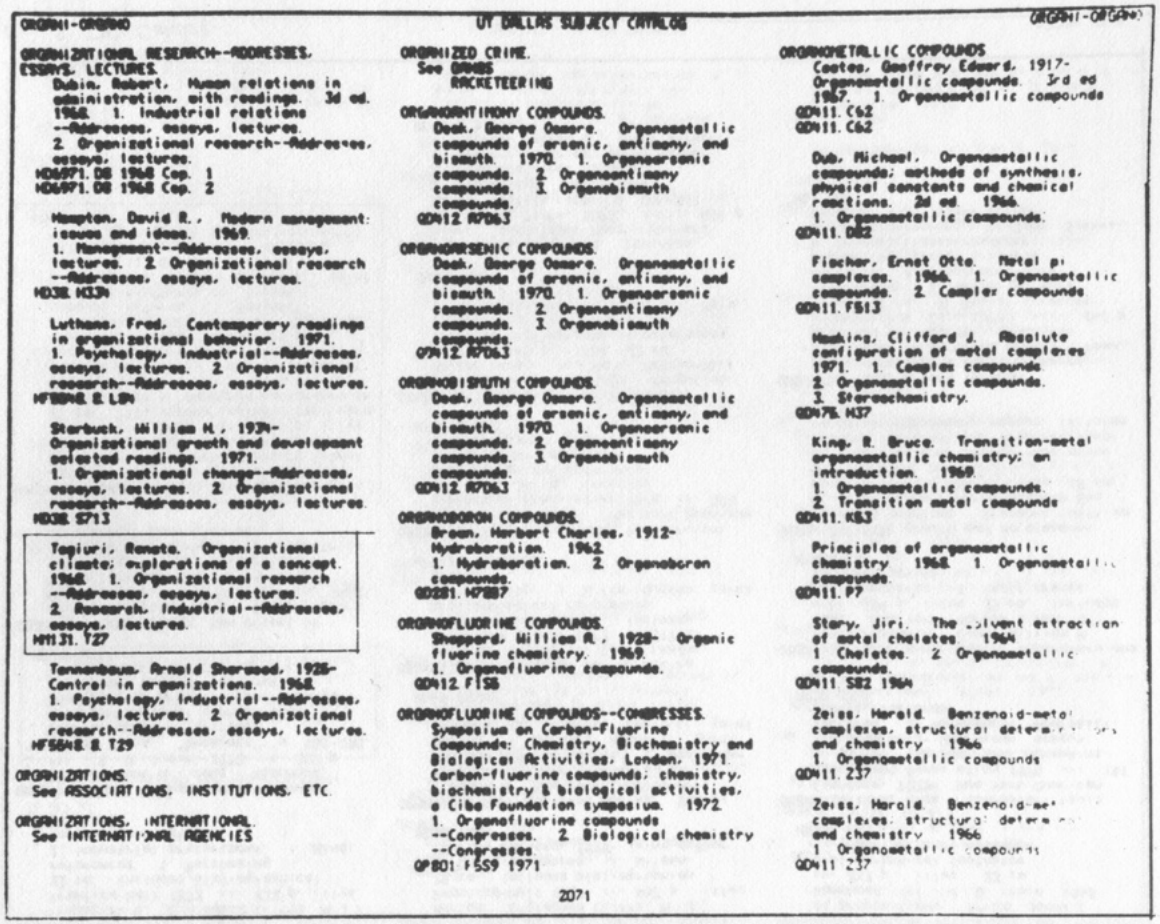
Fig. 2. Title Catalog.



ORGANI-ORGANO UT DALLAS SUBJECT CATALOG ORGANI-ORGANO

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Dubin, Robert, Human relations in administration, with readings. 3d ed. 1968. 1. Industrial relations --Addresses, essays, lectures. 2. Organizational research--Addresses, essays, lectures.
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HF5548.8.L89

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HD38.S713

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HM131.T27

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HF5548.8.T29

ORGANIZATIONS.
See ASSOCIATIONS, INSTITUTIONS, ETC.

ORGANIZATIONS, INTERNATIONAL
See INTERNATIONAL AGENCIES

ORGANIZED CRIME.
See CRIME
RACKETEERING

ORGANOANTIMONY COMPOUNDS.
Doak, George Ossore, Organometallic compounds of arsenic, antimony, and bismuth. 1970. 1. Organoarsenic compounds. 2. Organoantimony compounds. 3. Organobismuth compounds.
QD412.A7D63

ORGANOARSENIC COMPOUNDS.
Doak, George Ossore, Organometallic compounds of arsenic, antimony, and bismuth. 1970. 1. Organoarsenic compounds. 2. Organoantimony compounds. 3. Organobismuth compounds.
QP912.A7D63

ORGANOBISMUTH COMPOUNDS.
Doak, George Ossore, Organometallic compounds of arsenic, antimony, and bismuth. 1970. 1. Organoarsenic compounds. 2. Organoantimony compounds. 3. Organobismuth compounds.
QD412.A7D63

ORGANOBORON COMPOUNDS.
Brown, Herbert Charles, 1912- Hydroboration. 1962. 1. Hydroboration. 2. Organoboron compounds.
QD281.H7B87

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Sheppard, William A., 1928- Organic fluorine chemistry. 1969. 1. Organofluorine compounds.
QD412.F1S6

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QP801.F5S9 1971

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Coates, Geoffrey Edward, 1917- Organometallic compounds. 3rd ed 1967. 1. Organometallic compounds
QD411.C62
QD411.C62

Dub, Michael, Organometallic compounds; methods of synthesis, physical constants and chemical reactions. 2d ed. 1966. 1. Organometallic compounds.
QD411.D82

Fischer, Ernst Otto, Metal pi complexes. 1966. 1. Organometallic compounds. 2. Complex compounds
QD411.F513

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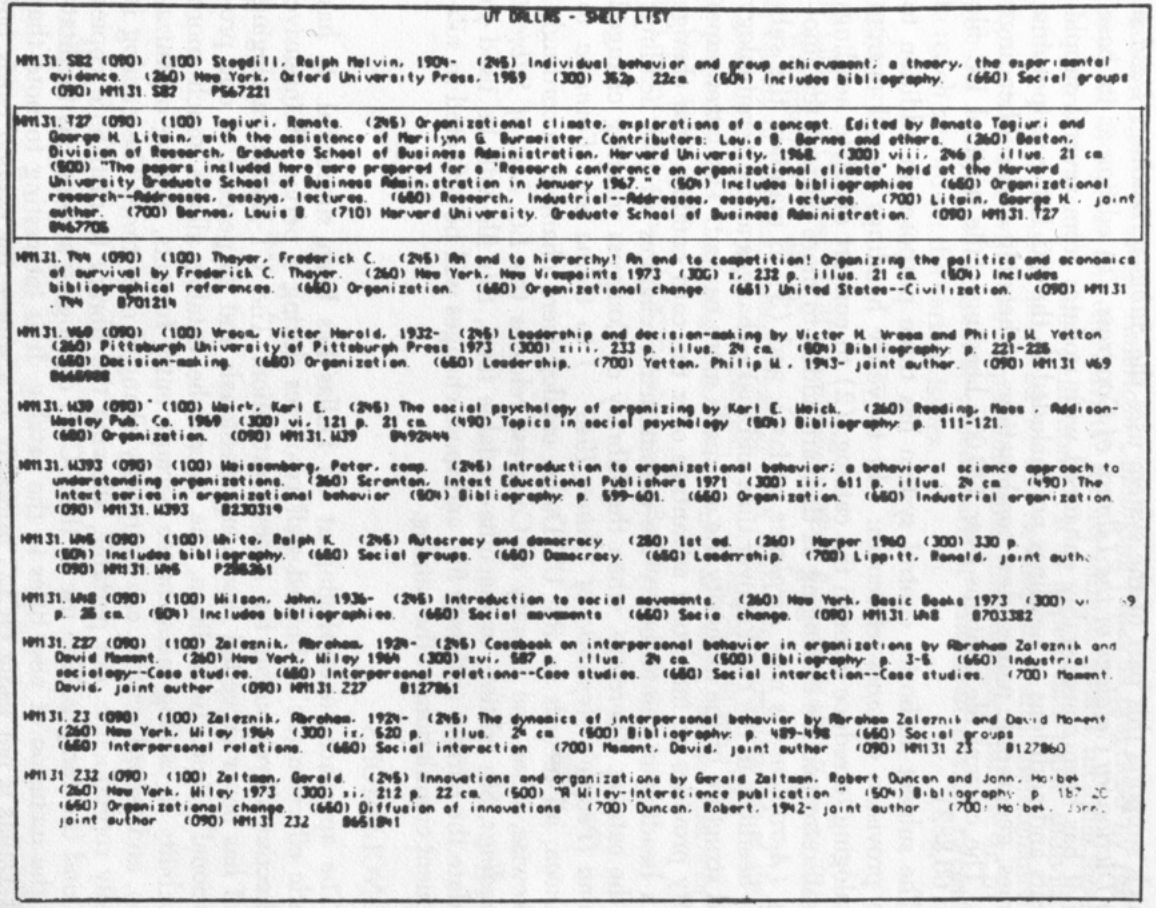
2071

Fig. 3. Subject Catalog.



UT DALLAS - SHELF LIST

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HM131 .T44 (090) (100) Thayer, Frederick C. (245) An end to hierarchy! An end to competition! Organizing the politics and economics of survival by Frederick C. Thayer. (260) New York, New Viewpoints 1973 (300) x, 232 p. illus. 21 cm. (504) Includes bibliographical references. (650) Organization. (650) Organizational change. (651) United States--Civilization. (090) HM131 .T44 8701214

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HM131 .W393 (090) (100) Weissenberg, Peter, comp. (245) Introduction to organizational behavior; a behavioral science approach to understanding organizations. (260) Scranton, Intext Educational Publishers 1971 (300) xii, 611 p. illus. 24 cm. (490) The Intext series in organizational behavior. (504) Bibliography: p. 599-601. (650) Organization. (650) Industrial organization. (090) HM131 .W393 8230319

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HM131 .Z3 (090) (100) Zaleznik, Abraham, 1924- (245) The dynamics of interpersonal behavior by Abraham Zaleznik and David Moment. (260) New York, Wiley 1964 (300) ix, 520 p. illus. 24 cm. (500) Bibliography: p. 489-498. (650) Social groups. (650) Interpersonal relations. (650) Social interaction. (700) Moment, David, joint author. (090) HM131 .Z3 8127860

HM131 .Z32 (090) (100) Zaltman, Gerald. (245) Innovations and organizations by Gerald Zaltman, Robert Duncan and John Holbek. (260) New York, Wiley 1973 (300) xi, 212 p. 22 cm. (500) "A Wiley-Interscience publication." (504) Bibliography: p. 187-20 (650) Organizational change. (650) Diffusion of innovations. (700) Duncan, Robert, 1942- joint author. (700) Holbek, John, joint author. (090) HM131 .Z32 8661841

Fig. 4. Shelflist.

which supports this part of the system uses the *Subject Headings Used in the Dictionary Catalogs of the Library of Congress,* 7th edition as its base, but it has been considerably enhanced with updates from several supplements and additions of headings not included in the LC list, e.g., personal names, geographic names, new combinations of heading and subheadings, etc. The current file contains over 130,000 headings (the original LC file had 60,882).

The subject authority control system has three purposes in addition to the provision of cross-references: (1) to verify headings on all current cataloging to reduce error in the catalog; (2) to convert obsolete headings on all retrospective cataloging as they are added to more current terminology (*Aeroplanes* is now *Airplanes,* at last); and (3) to maintain the subject headings in the catalog over time and make changes as the terminology and structure of the authority file are made more current. The latter capability provides an important advantage over the card catalog. One change to a heading in the authority file automatically changes all like headings in the catalog. Therefore, when the Library of Congress recently changed *China (People's Republic of China, 1949-)* to *China* and *Formosa* to *Taiwan,* all records on the UT-Dallas catalog were changed accordingly. Likewise, when the Library of Congress releases the *LC List of Subject Headings,* 8th edition, in machine-readable form, this file will be used to update the current authority file, and those changes will be reflected in subsequent cumulations of the catalog.

CONCLUSIONS

The approach to cataloging at UT-Dallas has been successful. It has made effective use of limited staff resources during a period of intensive collection development for a new institution. The UT-Dallas cataloging staff has never exceeded four nonprofessionals and 25 percent of one professional's time. In addition, the microfiche catalog allows much more flexibility in catalog maintenance because entry formats, catalog organization, and record content can be readily changed over time. The catalog is easily reproducible and portable, allowing the library to distribute copies around the campus. The use of the OCLC cataloging service has facilitated the inclusion of new titles in the catalog. It is interesting to note that UT-Dallas is not using OCLC primarily as a source for catalog cards but as a source for customized machine-readable records. This raises some interesting questions about the future of OCLC: Will OCLC's role as a card production service diminish as more libraries use machine-readable alternatives to the card catalog just as UT-Dallas has? Will OCLC undertake to maintain the customized cataloging data base of each of its member libraries, which is quite a different service than now offered?

The example of UT-Dallas highlights the importance of standards developed within the library community which, because this library was willing to adopt them, created the opportunity described above. The relevant

standards are the *Anglo-American Cataloging Rules* as practiced by the Library of Congress and the MARC record format, which includes both a data structure and a data definition.[3, 4] It is hoped that those individuals within the profession involved in the development and maintenance of these standards will take inspiration from this example and use it to replenish some of the personal expenditure of emotional energy necessary to reach accord on the various issues.

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A Computerized Bibliographic Service for the Blind and Physically Handicapped

Morton H. FRIEDMAN: Library of Congress.

In 1897, as a special service to the blind, the Library of Congress established a small reading room stocked with approximately 500 books and music items in raised type. In 1974, a comprehensive internal study was begun by the Library of Congress Division for the Blind and Physically Handicapped (DBPH) in preparation for the automation of a library program that circulated approximately 12 million tapes, records, machines, and brailled books in that year. This paper is the description of a three-year plan and a system study designed to produce a computerized union catalog and an in-process file for both DBPH and a network of almost 200 libraries throughout the nation.

A national program of free library services is available to the nation's handicapped as a joint effort of the Library of Congress Division for the Blind and Physically Handicapped (DBPH) and a network of regional and subregional libraries throughout the United States. The Library of Congress selects and produces full-length books and magazines in recorded form (disc and cassette) and in braille, and distributes them to 54 regional and over 125 subregional libraries, which circulate them to eligible persons. Reading materials are sent to readers and returned to libraries by postage-free mail.

Established by an act of Congress in 1931 to serve blind persons, this program was expanded in 1966 by Public Law 89-522 to include people with physical impairments that prevent the reading of standard print. Appropriations for the Division are made annually by Congress. In fiscal year 1975, $11,400,000 was budgeted at the federal level. Regional and subregional libraries receive funding from state and local sources. During fiscal year 1974, the combined federal, state, and local expenditures for this library program totaled over $17 million.

Anyone who is unable to read or use standard printed materials as a result of visual and physical limitations may receive services. A recent survey indicates that as many as 7.6 million persons may be eligible. Of this num-

ber, over 1 million have a visual handicap and 6 million are physically impaired by paralysis or weakness caused by conditions such as cerebral palsy or multiple sclerosis.

Approximately 420,000 children and adults are currently taking advantage of the program—19,000 borrow braille and 401,000 borrow recorded materials produced for and played on special record players, cassette players, and other products manufactured to DBPH specifications. In 1974, nearly 12 million items were circulated to readers in the United States and Puerto Rico and to American citizens temporarily living abroad.

The organizational chart in Figure 1 highlights the functions of DBPH. All automation and system efforts originate from the Project Coordination Office, which operates on a staff level.

DBPH also has several unique characteristics:

1. DBPH has been assigned a combination of typical and atypical library and bibliographic center operations. Typical operations include reference, ordering, etc. Atypical operations include book selection for reproduction in special media, management of copyright clearance (reproduction permission), solicitations, development and testing of playback equipment, distribution and control of playback equipment, etc.
2. DBPH deals with a user population requiring bibliographic descriptions that are specialized beyond standard library cataloging. To meet these user needs, DBPH must modify, to various degrees, the Library of Congress' cataloging standards (e.g., the MARC format).
3. DBPH provides little or no direct service to other Library of Congress divisions, except in specialized reference areas; it is essentially outside the normal processing, storage, and circulation systems of the Library of Congress, both manual and automated.
4. DBPH has a continuing national service responsibility with a network of regional and subregional libraries, and a relationship with various agencies producing materials for the blind and physically handicapped. To meet its goals, DBPH must be in a position to cooperate effectively with these agencies.
5. To develop an effective long-range plan for a bibliographic information system for the blind and physically handicapped, DBPH must give equal weight to internal and external system requirements. Of course, compatibility of these dual considerations is desirable, but when conflict between them arises, DBPH, by its mandate, must respond first to the external demands.

SYSTEM BACKGROUND

The development of an integrated bibliographic information system for the blind and physically handicapped is a long-range project. Funds have been allocated by the Congress to DBPH to begin work on the first phase of the project—the development of a bibliographic center for the

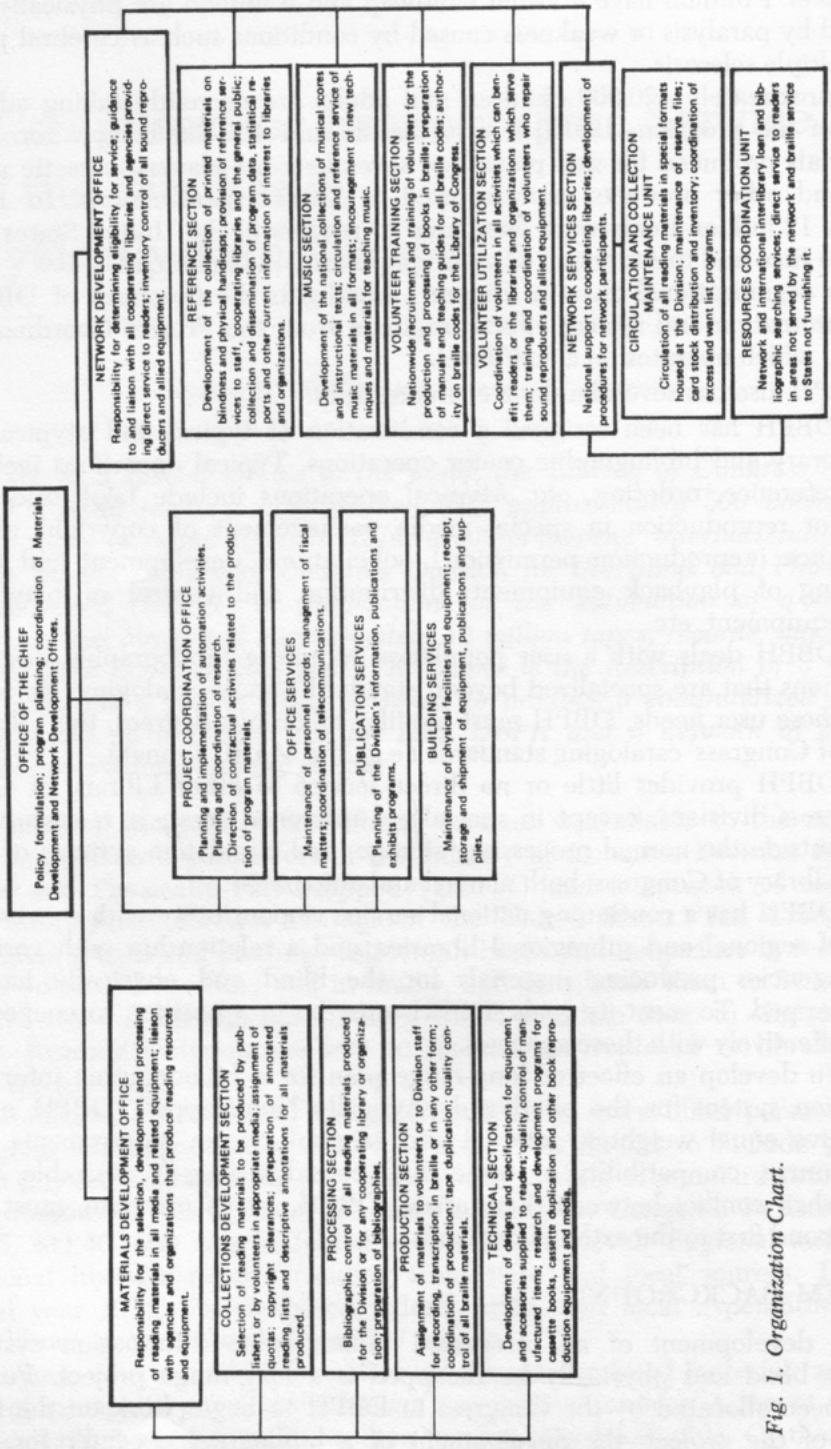

Fig. 1. Organization Chart.

blind and physically handicapped. It is expected that this work will be accomplished during the three-year period from fiscal year 1975 to fiscal year 1977.

This phased effort toward a national system recognizes the necessity of the initial development of a standardized machine-readable, core data base at DBPH; the development of national standards and procedures; and the orderly formulation of a long-range plan for implementation of a national system. Thus, the first three-year program will focus on the automation of bibliographic records.

In developing an automated system, DBPH has five basic goals:

1. to increase the effectiveness of service to the blind and physically handicapped;
2. to promote effective communication about bibliographic materials between agencies serving the blind and physically handicapped;
3. to make maximum use of appropriate Library of Congress operations, equipment, and bibliographic standards;
4. to reduce the per-unit cost of processing materials in DBPH; and
5. to devise a foundation for a national bibliographic system for the blind and physically handicapped.

THREE-YEAR AUTOMATION PLAN

In preparation for developing an automated bibliographic control system, a three-year automation plan was devised. An overall objective was specified, various tasks and subtasks were delineated for each year or phase of the project, and a total cost estimated. The three-year plan provides overall guidance in developing a complete system design and implementation schedule. It is understood that changes in requirements or other unforeseen developments may postpone, eliminate, modify, or add some tasks.

Phase I: System Analysis, Design, and File-Building

Fiscal Year 1975

TASKS	STATUS
TASK A—Bibliographic Record Development Review catalogs for completeness, relevance, accuracy, and coverage, by conducting a physical inventory and reviewing for conformity to applicable standards; Develop recataloging procedures, including record formats.	In process. To be completed by the Retrospective Cataloging Project: Cataloged entries on 12,000 titles produced and distributed to all network libraries have been revised and 22,000 titles produced in limited quantities by volunteers are now being recataloged. All manuals, procedures, and forms have been developed. Completion is expected by spring 1976.
TASK B—Systems Study Review DBPH operations; Interview selected regional and subregional librarians;	In process and will be completed with the acceptance of a system report by LC administrators. Completed in summer 1975.

Review existing hardware systems; Recommend system of converting previously cataloged titles to machine-readable formats; Recommend system for handling requirements on a continuing basis.	
TASK C—Catalog Record Conversion Convert recataloged titles to machine-readable form.	Award has been made and if sample input is acceptable, completion is expected in early 1976.
TASK D—System Development Initiation Prepare a basic system to allow input of a modified MARC record for eventual book, COM and/or catalog output.	In process. Basic steps have been begun and inputting initiated. If final system recommended is acceptable, the Library of Congress Information Systems Office will submit a more detailed outline, and system specifications. Included will be the ability to finish recataloging project by using current computer system. Expected completion date is spring 1976.

PHASE II: System Development and Implementation

Fiscal Year 1976

TASKS	STATUS
TASK A—System Development and Implementation Develop, test, and debug software; Select hardware; Document system.	To be initiated after system study is accepted. Initial terminals selected.
TASK B—Production of Initial DBPH Catalogs Produce hard copy version of initial 12,000 converted titles; Produce hard copy and microfiche of volunteer produced copies of limited and widely distributed titles (Union Catalog).	To be initiated as soon as machine-readable records are produced and format is accepted. Arrangements have been made to use the LC Videocomp for photocomposition.
TASK C—Input Cataloging Data for Remaining Titles Gather bibliographic data on tactile and recorded titles produced by affiliated agencies and volunteer groups.	Initial planning has begun.

PHASE III: System Installation, Testing, and Monitoring

Fiscal Year 1977

TASKS	STATUS
TASK A—System Outputs Produce hard copy and microform union catalog; Produce cumulative monthly catalogs, in-process listings, etc.	To be developed from system design and development in Phase II.

TASK B—System Development and Testing Integrate, monitor, review, and complete system; Establish operating criteria and interfaces, and define network data (e.g., flow, rate, media).	To be developed by documenting entire system flow of operation procedures and user interface.
TASK C—Additional System Input, Especially Non-LC-Produced Titles	To be developed after system is operational.
TASK D—Additional System Hardware Define additional CPU, terminals, printers, etc., requirements; Lease hardware.	To be developed after system is operational.

SYSTEM DESCRIPTION

The DBPH Bibliographical Information System will contain three subsystems:

- In-process subsystem
- Union catalog subsystem
- Management information subsystem

The in-process subsystem will track the status of every title entered into the system, from the point of selection for print copy to the creation of the final authoritative bibliographic record and distribution of the books produced. The record of each title is updated with additional information as the title goes through the various stages of processing: order and receipt of print copy; review and selection; copyright clearance; cataloging; limited production (i.e., production in limited quantities by volunteers, either in braille or as cassettes); and mass production (i.e., records, cassettes, and braille produced on a printing press, in quantities sufficient for distribution to all network libraries); and distribution.

The in-process file will be a union file in the sense that it will include copyright requests from the network as well as the bibliographic records of titles not produced by DBPH. The file will be available for on-line searching and update at DBPH.

Each record representing a title in the in-process file will contain three types of information: processing status, management information, and bibliographic data.

Titles residing in the in-process file will include not only those titles in the processing and production cycle but also those titles that will not be completed for such reasons as denial of permission to reproduce (copyright), loss during processing/production and technical production problems, such as extensive illustrations, language difficulties, and document length. Management and bibliographic information concerning all such titles remains in the in-process file. Status codes will be changed to indicate that these titles are no longer in-process and are considered "dead" as of the date the change is entered. This will enable a person searching the file

for purposes of selection, for example, to determine that the title has previously been considered but was not cleared for copyright.

Dead titles remaining in the file for five years will be permanently transferred to a history tape, available only for batch production of management reports.

If a rejected title is reconsidered, the appropriate changes in status code and entry date will be made through on-line access, if the title is less than five years old, or through a monthly update of the history tape, if the title is more than five years old. Should the item be accepted for production at this time, the old entry will be purged from the history tape and reentered in the in-process file as a new item.

Titles completing the processing and production cycle will be transferred out of the in-process file. The management information associated with these titles will be transferred to the management information subsystem, which supports various management reports, and the bibliographic data will reside in the union catalog subsystem, which supports the book and microfiche catalog and other publications requiring the bibliographic record.

Figure 2 includes an overview of the DBPH Bibliographic Information Subsystem and of the relationships between its major components. Figure 3 is a more detailed picture of the cataloging process.

SYSTEM ACCESSIBILITY

For the system to operate most efficiently, an access authority scheme must be established to identify the type of access available and the personnel who are to access the system.

It is of the utmost importance that the security of the data base be maintained. In order to assure that changes to the data are made by authorized parties only, security codes will be developed to permit appropriate parties to modify those files in their area of major interest. The chart in Figure 4 indicates the sections and staff permitted to interface with the system and the type of action involved. The following terms are used:

- Query—Search for information.
- Change—Input, update, deletion, merging, or sorting of data.
- Professional (P)—Professional librarian or the equivalent.
- Technician (T)—Nonprofessional librarian with decision-making responsibility within the scope of the tasks assigned by a supervisor.
- Clerk (C)—Clerk typist, secretary, or equivalent.
- Yes—Direct interface with the system.
- Indirect (I)—The section indicated requests that the action specified be accomplished by another section. (The term is used only in cases where volume of activity does not justify hands-on access to the system.)
- Blank square—No interface with the system.

Those sections needing direct access on a continuous basis should receive a terminal; all others will share a terminal located as conveniently as pos-

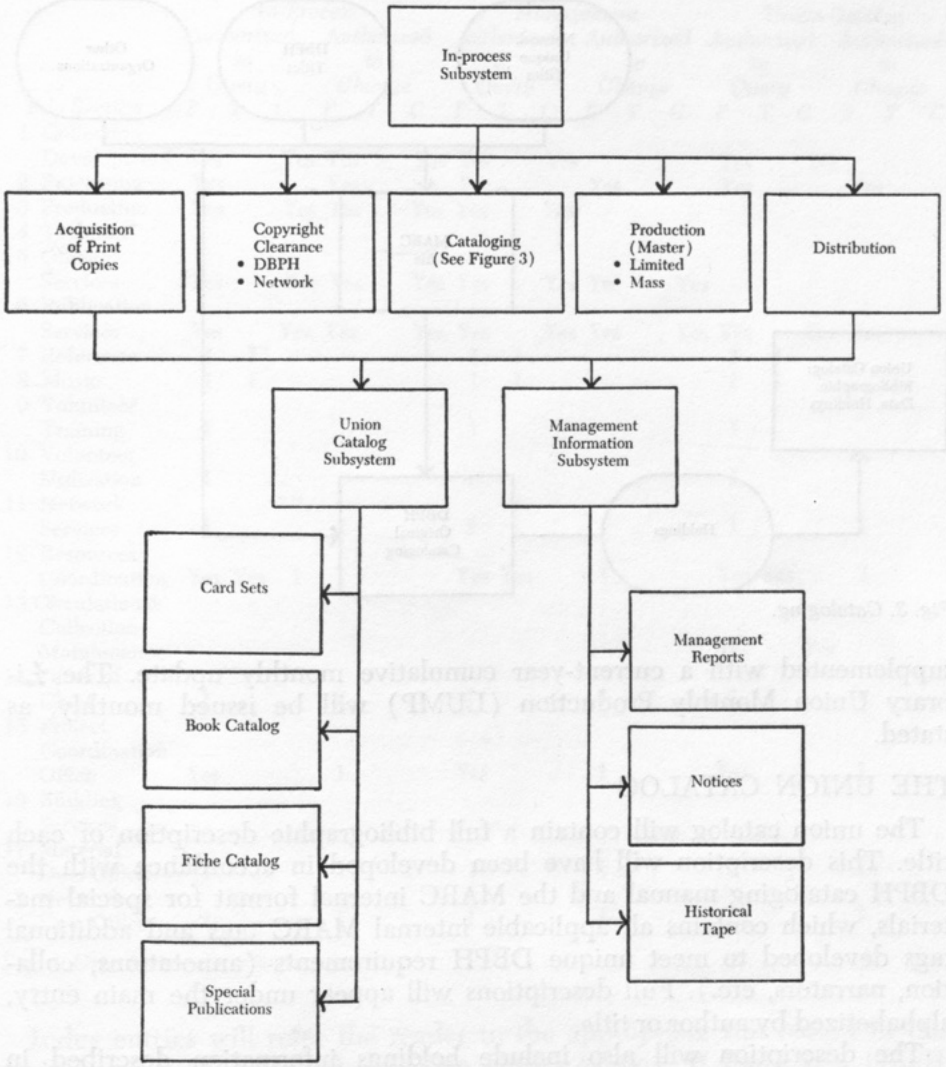

Fig. 2. Overview of DBPH Bibliographic Information Subsystem.

sible. Since the volume of activity can only be estimated at this time, no final decision concerning the actual location of terminals has been made.

INDIRECT ACCESS

Some type of regular access must be made available to the regional and subregional librarians and staff of volunteer organizations, scattered throughout the country, who cannot tap computer resources directly. Provision of this access will be accomplished through three products, one circulated annually and two others monthly throughout the DBPH network of cooperating libraries and agencies. The annual union catalog will be

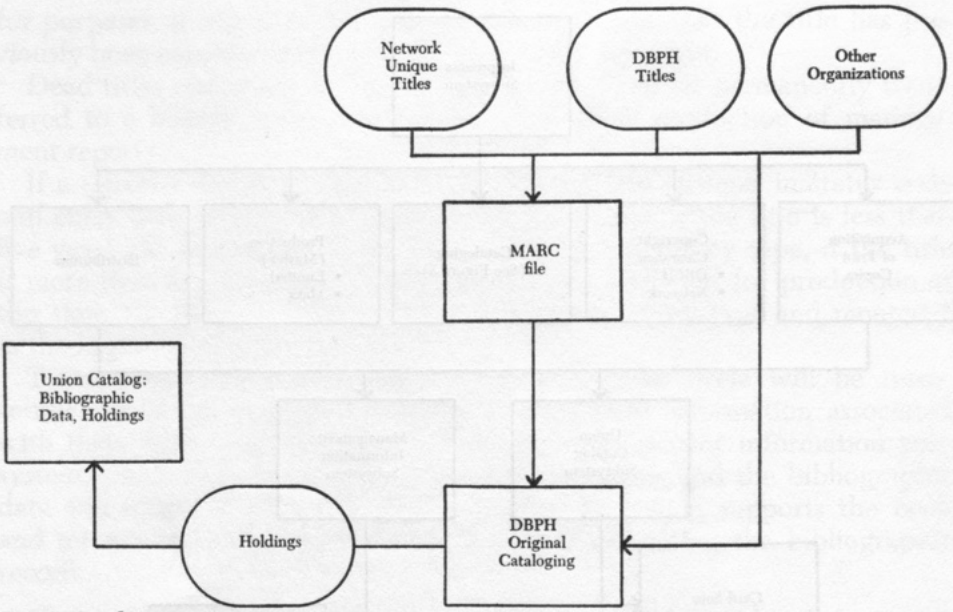

Fig. 3. Cataloging.

supplemented with a current-year cumulative monthly update. The Library Union Monthly Production (LUMP) will be issued monthly, as stated.

THE UNION CATALOG

The union catalog will contain a full bibliographic description of each title. This description will have been developed in accordance with the DBPH cataloging manual and the MARC internal format for special materials, which contains all applicable internal MARC tags and additional tags developed to meet unique DBPH requirements (annotations, collation, narrators, etc.). Full descriptions will appear under the main entry, alphabetized by author or title.

The description will also include holdings information described in terms of material location code, book number, collation, lending conditions, and producing library or group code (if different from material location). Figure 5 is a sample complete entry in the union catalog. Indexes will be provided under the following additional access points:

- Subject heading
- Book number—including DBPH and local library numbers—generally used to identify medium (talking book, braille, etc.) and shelf location of books
- Narrator—person recording the book onto disc or cassette. (Many readers base their book selection partly on personal preferences for certain narrators.)
- Dewey number

	In-Process						*Management*						*Union Catalog*					
	Authorized to Query			*Authorized to Change*			*Authorized to Query*			*Authorized to Change*			*Authorized to Query*			*Authorized to Change*		
File Section	*P*	*T*	*C*	*P*	*T*	*C*	*P*	*T*	*C*	*P*	*T*	*C*	*P*	*T*	*C*	*P*	*T*	*C*
1 Collection Development	Yes			Yes			Yes			Yes			Yes			Yes		
2 Processing	Yes			Yes			Yes			Yes			Yes			Yes		
3 Production	Yes			Yes			Yes			Yes								
4 Technical																		
5 Office Services	Yes			Yes			Yes			Yes			Yes			Yes		
6 Publication Services	Yes			Yes			Yes			Yes			Yes			Yes		Yes
7 Reference	I	I					I	I					I	I				
8 Music	I	I					I	I					I	I				
9 Volunteer Training	I						I						I					
10 Volunteer Utilization	I						I						I					
11 Network Services	I			I			I			I			I			I		
12 Resources Coordination	Yes	Yes	I	I			Yes	Yes		I			Yes	Yes		I		
13 Circulation & Collection Maintenance													Yes			Yes		
14 Office of Chief	I			I			I			I			I			I		
15 Project Coordination Office	Yes			I			Yes			I			Yes			I		
16 Building Services																		
17 Material Dev. Office	I			I			I			I			I			I		
18 Network Dev. Office	I			I			I			I			I			I		

Fig. 4. User System Interface.

Index entries will refer the reader to the appropriate full record in the main entry (author or title) section of the catalog. If there is a DBPH book number, it will be included in each index entry.

Media and Frequency of Issue

The *DBPH Union Catalog* will be issued annually, in both print and microfiche. This is the major product of the DBPH Bibliographic Information System.

The hard copy version of the catalog will be produced in six-point type (similar to newsprint size), permitting three columns of entries per page. This should be read easily by the normally sighted and by those with some visual limitations. Discussions with selected network librarians indicate that this size is acceptable. Smaller sizes are considered to cause some eye strain when used frequently.

Stafford, Jean, 1915– .
The collected stories of Jean Stafford. New York, Farrar, Strauss and Giroux, 1969.
AFB
A collection of short stories centering on the individual and his or her relation to time and place, frequently set during the cocktail hour and the dinner party afterward.
CONTENTS: The innocents abroad.—The Bostonians.—Other manifestations of the American scene.—Cowboys and Indians.—Magic mountains.—Manhattan Island.
1. Short stories. 2. Identity. I. Benson, Esther, narrator.

PZ3.S7783Co 813.54 72-993097

TB3389	1	26s. 10in. 16rpm 1144min.	←DBPH material
BRA245	2	29v. handcopied	
CBA3742	3	17c. C-90 15/16ips	
		DBPH FLMS MARL	
BRFLMS469	FLMS	30v. handcopied 2 (ALRL)	←Producing Library or Group
CBCARL3210	CARL	14c. C-120 1⅞ 1	
CBUTMS1758	UTMS	14c. C-120 1⅞ 2 (ORRL)	
↑ Book Number	↑ Material Location Code	↑ Collation	↑ Lending Conditions Code

Fig. 5. Sample of Complete Entry in Union Catalog.

To assure that this type size is fully acceptable, a test catalog will be produced and distributed to the DBPH network. Feedback over a three-month trial period should be sufficient to either confirm the choice or provide justification for a larger size, a different format, or layout changes. The number of pages and total cost could be substantially increased by such adjustments.

Microfiche at 42X reduction will be produced concurrently with the print version. Microfiche permits the use of a less expensive reading machine by the libraries than would be the case with microfilm. In addition, the microfiche reading machines under consideration are capable of projecting a large image on a screen for librarians with visual problems.

There are significant advantages to be gained by issuing the catalog in book form. For example, a recent survey of selected network libraries indicates a strong preference for a printed catalog because a book catalog: (a) can be used without special equipment; (b) is portable and relatively easy to handle and scan; (c) allows the insertion of notes; (d) can be used for initial reporting of unique titles and holdings of the network libraries; and (e) has a wider potential distribution outside the network, e.g., to hospital libraries, nursing homes, and retirement communities, where a large number of users or potential users may be located.

The cost and/or size of the book catalog may outweigh these advantages. Projections based on various systems surveys indicate that by 1979 a print catalog could cost over $250,000 and consist of twenty-five volumes

(900 pages each). Thus, disadvantages could eventually force the print edition to be discontinued, leaving only the microfiche version.

THE LIBRARY UNION MONTHLY PRODUCTION

The Library Union Monthly Production (LUMP), derived from the in-process subsystem, will contain brief entries for all titles, regardless of their stage of production, including an indication of the status of each title.

There are currently 1,500 titles in-process at any one time. It is estimated that for every ten titles that are eventually included in the union catalog, there will be five dead titles. Four out of every ten titles considered for production are rejected, and one out of every ten copyright requests is denied. All dead titles five years or older will be transferred to the history tape prior to the issuance of LUMP. The probability that a five-year-old title will be produced is low.

DBPH has been informed that the Government Printing Office would require a minimum of six weeks to produce and distribute a print issue of LUMP. At this rate of production, the lag time in terms of the currency of information would be compounded at each successive issue. In view of the scope, frequency of issue and currency requirement of LUMP, the only feasible medium is microform. Computer output microform (COM) has a turn-around time of three to five days. LC is considering the acquisition of in-house COM-production capability, but now relies on outside resources.

UNION CATALOG MONTHLY UPDATE

DBPH plans to issue an update to the union catalog, which will be cumulated monthly and printed on microfiche. This update will provide complete bibliographic information under the main entry with indexes by subject heading, book number, narrator, and Dewey number, as a minimum. Each index entry will contain author and title.

Currently, librarians must use DBPH-provided catalog cards and examine an estimated sixty-six separate catalogs in order to perform a thorough search. Several card catalog files are searched by DBPH staff members in answering requests. Under the new system, when searching for any title, only three sources will have to be consulted: the union catalog, its monthly supplement, and LUMP.

CONCLUSION

The automated system will provide DBPH personnel and the network libraries with improved access to the available material for blind and physically handicapped readers. The three-year plan established the guidelines to be followed in producing a computerized catalog. As a result of the system study, a series of milestones have been proposed. They are:

1. Fall 1976—Production of the DBPH union catalog containing network libraries' holdings.
2. Spring 1977—Beginning of monthly union catalog and the in-process listing.
3. Fall 1978—Production of the DBPH union catalog containing network libraries' holdings and cooperating independent agencies' holdings.

As with all good systems, much can happen between now and three years from now. As Murphy's Law explains, "If something can go wrong it will." Until outputs are actually produced, the system, or any module of it will not be considered operational, because a system will be judged by the timeliness, the quality, the relevance, and the usability of its products. When we can so evaluate the outputs, then we can determine whether the system is successful. Somehow all the wonderful plans, charts, computations, and tables mean little compared to user reaction. It is likely that a year from now we will present our progress and a year after that, our successes, compromises, and, if any, our failures. There is as yet no conclusion to this article, only fingers crossed and further work to translate design plans into operational reality.

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TECHNICAL COMMUNICATIONS

ANNOUNCEMENTS

Statement of the American Library Association to the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee on the Cable Television Industry, July 17, 1975

The American Library Association and its Information Science and Automation Division appreciate this opportunity to comment on the relationship between libraries and cable television systems.

The successful development of cable television networks is extremely important to the future of library services in this country. The National Commission on Libraries and Information Science has just completed a document describing in general terms a proposed national program for library and information service. The commission's findings, which will be submitted to Congress in the form of proposed legislation containing the elements of the national plan, emphasize the need for libraries to make maximum use of new communications technology in order to make information equally available to all citizens.

"The joining of such diverse technologies as computers and telecommunications represent a new capability of great potential value to the United States," the commission wrote. "As yet, the nation has not perceived the far-reaching consequences of being able to distribute information to distant points with relative ease. CATV systems and computer data banks are just beginning to be used by libraries as means for information dissemination. . . . The Commission believes that the potential of the new technologies must be utilized to the fullest extent possible. . . ."

In its early days, the cable industry extended many promises to the public, to the FCC, and to local communities. There is no doubt that the cable does hold the potential to include us all in "the wired nation," but at the present time the cable industry is too fragmented and lacks the capital to create this broad information network foreseen by early pioneers in cable. Nevertheless, the cable television industry is already assuming an important role in the delivery of library services to citizens in many communities across the country, and in return, libraries have the potential to serve as the major general information resource that the cable television industry needs to become an effective information link.

Libraries are now using cable television to provide rapid information services on demand to local citizens in their homes and businesses. For example, in 1970 the Natrona County Public Library in Casper, Wyoming, decided to try providing library services over the cable. The library began broadcasting over one channel and now has acquired a second. It uses the cable's video capability to answer people's questions with the help of maps, charts, and other visual aids.

The Natrona County Library operation showed that a CATV tie-in was feasible and had major potential for future information services. The library has subsequently acquired access to a computer and has developed microfilm production capabilities, and the staff hopes in the near future to interface the computer and the microfilm with the cable television system. At that time it will be able to provide a true rapid information retrieval system to the homes of the people throughout the county.

Other libraries across the country are also using cable to make their services available to a wider public. In Bakersfield, California, the public library uses a cable channel to show videotapes and to advertise books and materials that homebound patrons can receive by mail. At latest count there are nearly 400 areas where li-

braries are working with local cable operators. Many other communities should be able to benefit from the same kind of library cable cooperation that is now available in such places as Casper and Bakersfield. However, there are several major handicaps, one of which relates directly to the area of concern to this subcommittee.

The overall economic situation which has restricted the amount of private capital available for initial investments has badly hurt the cable television industry and has been a serious factor in the industry's failure to live up to its early promises. In addition, the extreme complexity of the legal questions surrounding the jurisdiction of the Federal Communications Commission, local governments, and other agencies has also hampered the rapid development of cable as a local communications medium.

But a major source of difficulty—the one of interest to your subcommittee—has been the open hostility between television networks and cable operators. The hostility seems to have its roots in the belief that cable television is in serious competition with local, conventional TV.

As we see it, the basic problem lies in the failure of the government to define clearly the divergent roles of the two media. In the future, libraries and other users will rely more and more on cable systems as *communications systems.* Therefore, cable operators have an extremely important role to play in providing a wide range of community users with the tools and methodology for accomplishing this local communication.

The absence of a defined area of responsibility for the cable television industry magnifies and distorts other problems. Many agencies see in cable television an opportunity to rectify the problems encountered with network television. It seems to us the task of cable system operators should be primarily to provide a quality communications link on which other users, such as libraries, can produce programs of local significance. In this regard, cable systems should be required to provide certain dedicated channels and reduced rates for public-interest programming such as library services, school programs, and citizen information.

With this in mind, we believe the relationship between the networks and cable television should be viewed as a partnership in which cable and commercial television work hand in hand to develop their individual communications capabilities. The current direct competition creates a severe strain on the overall concept and provides a reason for the conflict between cable and broadcast interests.

The American Library Association hopes that the subcommittee will examine carefully the roles of the various industries and agencies involved in developing our national communications network. We are all aware of the tremendous importance of this network and we believe that the development of an efficient communications medium is critical to providing needed information to all citizens.

The association believes it is extremely important at this time for Congress to foster the development of a wide range of communications technologies and to take whatever measures it feels appropriate to correct situations which inhibit the growth of better communications systems. We believe the availability of cable television to libraries might well prove an important factor in providing high quality information services to people from all walks of life and in all parts of the country.

Thank you for this opportunity to comment on what we believe is a serious problem that merits the concern of your committee.

Call for Papers Issued for Symposium on Micro and Mini Systems

A call for papers has been issued for a symposium on "Trends and Applications: Micro and Mini Systems" to be held at the National Bureau of Standards, Gaithersburg, Maryland, May 27, 1976.

The symposium will be sponsored by the IEEE Computer Society Eastern Area Committee, the Washington, D.C. Chapter, the IEEE Washington Section, and the National Bureau of Standards.

Submitted papers should be of a tu-

torial nature, describing practical experiences with micro and mini systems, or presenting new research results. Topics to be covered include: "Networks of Processors," "Multiprocessor Ensembles," "Intelligent Terminals," "Novel Architectures," "Programming and Operating Systems," "Security," "Performance Evaluation," and "Novel Applications."

Three copies of 1,000-word abstracts should be submitted to: Jack Benoit, MITRE Corporation, Westgate Research Park, McLean, VA 22101, by January 15, 1976.

Notification of acceptance will be sent to authors by February 15, 1976. Authors will then be asked to submit camera copy to be printed in the conference proceedings by April 1, 1976.

For further information, contact: Marshall Abrams, National Bureau of Standards, Technology B-212, Washington, DC 20234; phone (301) 921-2601.

Workshop for Library Managers

The American Society for Information Science (Washington, D.C.) and Ringgold Management Systems Division (Beaverton, Oregon) have entered into a joint venture to produce a series of continuing education workshops for librarians. The first one is entitled "Management of the Library in Transition: Analysis and Administration of Automated Systems and Services for the Library Manager." Speakers include: Bruce D. Bajema, director, Marin County Free Public Library; Alan R. Benenfeld, coordinator, Physical Sciences & Technology Libraries, UCLA; Brett B. Butler, president, Butler Associates; and Ralph M. Shoffner, vice-president, Ringgold Management Systems.

This two-day workshop will be presented in seven cities throughout the country during the coming year. The first two presentations are set for the Sheraton-Boston, October 25 and 26, 1975 (as a preconference to the Annual ASIS Conference); and for the McCormick Inn, Chicago, January 15 and 16, 1976 (immediately preceding ALA Midwinter). Subsequent workshops are planned for: Los Angeles (March 1976), New York City (April 1976), Washington, D.C. (April 1976), Atlanta, Georgia (May 1976), and Houston, Texas (May 1976).

Attendance is limited to 200. Registration fee: $95 for ASIS members; $115 for nonmembers. (Cosponsoring groups may obtain ASIS member rates.) For further information contact: F. Spigai, Workshop Director, P.O. Box 490, Phoenix, Oregon 97535; (503) 482-6445.

Advisory Group on National Bibliographic Control Establishes First Two Working Parties

The Advisory Group on National Bibliographic Control (jointly supported by the National Science Foundation, the National Commission on Libraries and Information Science, and the Council on Library Resources) has announced the establishment of the first two working parties under its aegis. The Working Party on Formats for Journal Articles and Technical Reports, chaired by Margaret Park of the University of Georgia, held its first meeting on July 15 and 16, 1975, in Washington. The Working Party on Bibliographic Name Authority Files, chaired by Ann Curran of the Boston Public Library, held its first meeting August 21 and 22, 1975, in Washington. The advisory group and the working parties it appoints to deal with specific tasks were established on the strong recommendation of participants in an April 1974 meeting on national bibliographic control.

If there is to be a truly national information handling system, a comprehensive and coherent approach to national bibliographic control is an absolute requirement. The recently published national program document of the National Commission on Libraries and Information Science further underscores this need. Regardless of where the overall organizational responsibilities for the national information network reside, certain bibliographic files and procedures will be required in order to resolve problems of incompatibility among the systems of those who produce, store, disseminate, and use bibliographic information. The activities of

these and future working parties constitute efforts leading toward the development of some of the building blocks from which ultimately will evolve a national system.

These efforts are based on the following assumptions:

1. Each processing organization will remain free to design its own internal formats, procedures, products, and services. Compatibility among these diverse systems will be achieved by standardizing the structure, content designation, and data content of the records to be exchanged among them. The price each must pay is to agree to provide for in-and-out compatibility with the standard medium of exchange.
2. Working party products must be comprehensive enough to accommodate all of the data elements required by publishers, abstracting and indexing services, information delivery systems, and libraries.
3. Format specifications will adhere to the national and international standard record structure (ANSI Z39.2-1971; ISO 2709(E)-1973).
4. Neither the working parties nor their sponsors are standard-setting agencies. If the work of a party at any time indicates implications for bibliographic standards work, the chairperson will inform the advisory group so that proper and formal action can be taken via existing channels.

The primary objective of the Working Party on Formats for Journal Articles and Technical Reports is to develop and refer to the advisory group format specifications for handling these machine-readable records that are being distributed or interchanged by the library, abstracting and indexing, publishing, and information delivery communities—both public and private. It is intended that the work of this party will result in at least the following products:

1. Written specifications for formats for the communication of the bibliographic records on magnetic tape.
2. A comprehensive content designation scheme that will satisfy the requirements of the communities enumerated above and yet take advantage of, complement, and be compatible with content designation schemes already in national use for the communication of bibliographic records.
3. Written guidelines to cover, to the degree possible, the input and tagging of these bibliographic communications records.

Members of the Working Party on Formats for Journal Articles and Technical Reports are Paul Klinefelter, Defense Documentation Center; Mitchell A. Krasny, National Technical Information Service; Samuel Lazerow, Institute for Scientific Information; Irving Lebow, Energy Research and Development Administration; Lucinda Leonard, Library of Congress; Peter Schipma, Illinois Institute of Technology Research Institute; and Richard Sharpe, Chemical Abstracts Service.

The primary objective of the Working Party on Bibliographic Name Authority Files is to define and report to the advisory group the national requirements for a name authority file and develop a standard format and content designation scheme for name authority records. It is intended that the work of this party will result in at least the following products:

1. A statement of requirements that clearly identifies the need for and intended uses of this file by the various sectors of the information community.
2. A national record format for name authority records, to include the accommodation of appropriate cross-references.
3. A comprehensive content designation scheme.
4. A recommended method for the linking of name authority records to the bibliographic records and vice versa.
5. A set of written guidelines to cover the input, coding, and tagging of the national name authority records.

Members of the Working Party on Bibliographic Name Authority Files are Eleanor Aronson, National Technical Information Service; Olga Luchaka, Defense Doc-

umentation Center; Suzanne Massonneau, Texas A & M; Mary Ellen Padin, Engineering Index, Inc.; Joseph Price, Library of Congress; John Rather, Library of Congress; James Rizzolo, The New York Public Library; Andrew Uszak, R. R. Bowker Company; and Edwin Buchinski, National Library of Canada, as observer.

Requests for information should be directed to the Advisory Group on National Bibliographic Control, One Dupont Circle, Suite 620, Washington, DC 20036.

NATIS (National Information Systems)

UNESCO has now published the final report of the Intergovernmental Conference on Planning National Documentation, Library and Archives Infrastructures, which was organized in cooperation with FID, IFLA, and ICA at UNESCO Headquarters in Paris, from September 23–27, 1974.

The final report contains the proceedings of the conference, the list of participants, the text of the recommendations, and the sixteen objectives of NATIS and can be obtained from the Department of Documentation, Libraries and Archives at the UNESCO Secretariat.

This intergovernmental conference brought together 254 delegates from eighty-six member states of UNESCO and sixty-three observers from organizations of the United Nations System, other intergovernmental organizations, and international nongovernmental organizations and foundations. Its successful outcome was the wholehearted and unanimous support given by developing and advanced countries alike for the concept of national information systems, known under the acronym of NATIS, and the objectives set forth for transforming this concept into action.

The concept of NATIS, with its objectives, is designed as a framework for concerted action at the national level and provides governments with a set of guidelines which will enable them to give a unified sense of direction and common aim to the diverse information activities being carried out in specific subject fields. By coordinating the national counterparts of the international programs through overall planning, all the elements which constitute NATIS will be brought together in a balanced program which will enable each country, whatever its stage of development, not only to reap the full benefit from world systems, but also to participate in a two-way flow of the information resources available to the world's community.

The NATIS concept implies that the government—national, state, or local—should maximize the availability of all relevant information through documentation, library, and archives services, just as in principle it takes responsibility for the basic education, at primary and secondary levels, of its citizens. It also implies that the NATIS structure will vary in different countries, but coordination of all its elements must be the main goal.

So the elements that should constitute NATIS are all services involved in the provision of specific information for all sectors of the community and for all categories of user, and its task is to ensure that all engaged in political, economic, scientific, technological, educational, social, or cultural activities receive the necessary information enabling them to render their fullest contribution to the whole society.

To achieve these aims, a national information plan will have to be developed in accordance with an established information policy and implemented, taking into account the priorities of national overall and sectoral planning. The plan should reflect the existing situation and possible ways of improving it, using to the maximum the human and physical resources available, and should provide for the creation of new capabilities and facilities backed up by a legislative framework and adequate financial provision for its effective implementation. An analysis of the performance and objectives of all types of library (national, public, school, university, special), documentation activity (data banks, abstracting and indexing services, national information analysis centers, etc.), and archives will show that coordination will improve their efficiency, and make it possible to fulfill the demands of users more efficiently.

Since the main objectives of NATIS are to enable each country to develop its information infrastructures so as to fulfill potential and real information needs of all categories of users, it is regarded by UNESCO as a complementary program to UNISIST and as a culmination of efforts made by the organization in the last decades toward achieving a systematic approach to the problems involved in the transfer of information.

In many countries, the launching of NATIS will require financial and technical assistance from national and international sources. UNESCO, therefore, proposes to draw up a program of action with short and long-term objectives to achieve the objectives of NATIS in its member states.

NETWORK NEWS

International Science Information Networks: Projected from U.S. Experience

Perspective. Present indications suggest that international science information networks will enjoy progressive and possible substantial growth within the coming decade. Driving forces behind this expected development are already evident in the U.S. Also, a shift toward relatively greater scientific literature output among scientifically less-developed countries should abet international networking. Against these positive forces are a number of inhibiting conditions, some of which can be ameliorated.

U.S. experience as guide. Information processing in the U.S. is increasingly dependent on computer and telecommunications technologies. Most major abstracting and indexing services are substantially computer-based. On-line searching is increasing rapidly, with some foreign connections already established. Commercial firms are prepared to provide services through international networks, provided there are sufficient paying customers. In addition, the spectacular growth rate of the Ohio College Library Center, acceptance of the MARC format as the basis of an ISO standard, and development of CONSER here and ISDS and UBC internationally point to international networks for worldwide bibliographic control.

While near term networking will be based on access to surrogate records, electronic publication, as it comes on, will open further networking possibilities. In the near future, some journals, handbooks, date compilations, and other reference materials will likely become available in COM and electronic forms. As with abstracting-indexing systems, journal browsing and reading via terminals will likely emerge slowly in the U.S., first as a novel by-product of conventional publication, and later as a product demanded for its unique advantages. Further, as global digital networks expand, transmission costs will decline considerably, and considerably more information will be moved electronically. Then electronic distribution of primary materials, data compilations, and other "publications" can be expected to share international networks that previously provided access to abstracting-indexing services.

Conditions prompting these developments in the U.S. today include the potentially favorable economics of electronic transmission over printing and distribution by mail; the necessity to use automated means for coping with the continued growth in literature; requirements to provide services to a large, increasingly more differentiated and widely scattered set of users, whose information needs are constantly shifting; and increasing appreciation of the cost-benefit returns of on-line searching versus manual searching or, worse, of ignoring available research and development results.

International implications. In varying degrees, these same forces should prompt international networking as well—albeit more slowly. But another newly developing condition should boost international interdependence for current scientific results. Dr. Derek de Solla Price projects a radical change in the growth rates of scientific literature in larger and richer countries as contrasted to smaller and poorer ones. The former, it seems, have nearly reached a zero growth rate of potential authors, while the author populations of the latter continue to grow explosively,

perhaps at rates of more than 10 percent per annum. Some of the impacts of this change can be anticipated. More journals and monographs will be published in more countries. In addition to national journals, there likely will be some regional journals and some new international journals. Expansion of abstracting-indexing services will likely parallel growth in numbers of serials. Further, there will be greater international marketing of these serials and services. Researchers in the scientifically developing countries will demand more literature and data from other countries. Also, scientists in countries already at the research front will have to pursue a much wider range of foreign sources to keep abreast of significant developments. The upshot of these developments will be greater use of searching tools as well as increased demand for improved document delivery services. And services that reduce time delays while extending their capabilities, as by on-line searching, will become increasingly attractive.

Impediments. While the long-term outlook is positive, certain impediments will have to be overcome. Some of these barriers, again evident today in the U.S., are:

- Inadequate financial bases. On-line services are vastly underutilized in the U.S., partly because users and their organizations are unable—or believe they are unable—to pay the going rates. The situation is worse in most foreign countries and is likely to remain that way in virtually all scientifically developing countries for years to come. Still, use is growing here, and there are harbingers of use in other countries as well.
- Uncertainties on pricing and marketing strategies. What pricing and marketing strategies offer the best assurance of long-term economic viability of services and networks? How can we best accommodate the copying preferences of users with publishers' requirements for economic solvency? These and related issues are sufficient to impede most new ventures today. Research and experience will help provide answers. To help managers of U.S. services, the Office of Science Information Service (OSIS) is supporting research on these questions. Results should be useful in formulating approaches to international networking.
- Lack of familiarity of on-line searching and networking among users and purchasers. In the U.S. only a small fraction of potential users are reasonably sophisticated in use of current computer-based searching tools. The situation is worse in most foreign countries. The answer obviously is vigorous pursuit of education, user training, and marketing programs—and research to learn how to familiarize potential users with current searching tools. Again, in the U.S. OSIS is trying to do something about educating users. Similar programs in other countries will help break down this barrier.
- Policy void. The information policy void in the U.S. is matched internationally. UNISIST offers some hope; additional guidelines might come from the experience of multinational programs such as AGRIS and INIS or from bilateral projects such as work toward a common U.S./USSR format for the exchange of machine-readable bibliographic records. If past experience is a guide, this problem, however, may be resolved by a series of de facto acknowledgments of "progress" based on operating arrangements worked out pragmatically by organizations that are committed to gain the benefits of networking. Meanwhile, of course, barriers now imposed by differential tariffs and national telecommunication policies will have to be resolved.

In summary, international networks will grow and will probably reflect experience —both good and bad—of similar networks within the U.S. and certain other developed countries.—*Office of Science Information Service.*

COMMERCIAL SERVICES

Chemical Abstracts Now Computer Produced

All of *Chemical Abstracts* now is being organized and typeset by computer. The shift of a final ten sections of abstracts to computer processing at the beginning of

volume 83 (July–December 1975) marked completion of a conversion effort that began seven years ago.

Chemical Abstracts Service first began to move toward automating its massive information-handling and publishing operations—the organization abstracts or indexes almost 400,000 papers, patents, and other scientific documents annually—in the mid 1960s. The National Science Foundation's Office of Science Information Service provided more than $25 million toward research and development in support of the effort.

To avoid any discontinuity in publication and allow for necessary development and staff retraining, CAS followed a stepwise approach in converting processing operations for *Chemical Abstracts* to a computer base. Bibliographic information was converted to computer processing in 1968, making it possible to produce author indexes automatically. Conversion of other semiannual indexes to computer-based production began the following year and was completed in 1970. Gradual automation of abstract processing and composition began in 1972.

All of the information processed for *Chemical Abstracts* now is recorded in a computer-readable data base. The contents of issues and indexes are selected automatically from this data store, organized and converted to the appropriate format and type style by computer program, and typeset for printing through a computer-controlled photocomposition device. Much of the information also is distributed in a form that can be manipulated and searched by computer, and organizations in nineteen nations offer search services based on these computer-readable files under licensing arrangements with CAS.

CAS officials emphasize that much still remains to be done and several more years of development are necessary to bring the computer-based processing system to full operating efficiency. They point out that separate processing operations for abstracts and index entries must be combined, and a larger portion of editorial operations put on-line to reduce paper flow and costly and time-consuming recycling of information for correction. Additional work also is needed to develop the best means for serving users from the computer-readable files.

The rate at which the additional work can be accomplished is uncertain at this point. National Science Foundation support of CAS research and development efforts was discontinued at the end of 1974. Unless CAS can obtain substantial new outside financial support, further development of the system is likely to proceed at a much slower pace.

STANDARDS

TESLA Reactor Ballot

Photocopy this form to respond to standards proposals. (For details see previous issues of *JOLA*-TC, vol.7, No.3 and 4.) Return ballots to John C. Kountz, Associate for Library Automation, Office of the Chancellor, The California State University and Colleges, 5670 Wilshire Blvd., Suite 900, Los Angeles, CA 90036.

TESLA REACTOR BALLOT

Identification Number For Standing Requirement:

_____

Reactor Information

Name _____

Title _____

Organization _____

Address _____

City _____ **State** _____ **Zip** _____

Telephone ( ) _____ – _____
AREA EXT.

Need
(For This Standard)

For ☐ **Against** ☐

Specification
(As Presented in This Requirement)

For ☐ **Against** ☐

Can You Participate In The Development Of This Standard _____

Yes ☐ **No** ☐

Reason For Position: (Use Format Of Proposal. Additional Pages Can Be Used If Required)

Book Reviews

Computer-Based Information Services: Practical Experience in European Libraries. Proceedings of the Fifth Triennial Meeting of the International Association of Technological University Libraries, Copenhagen, June 6–8th, 1973. Edited by C. M. Lincoln. Loughborough: University of Technology Library, 1974. 99p. £2.50.

With Copenhagen for its site, the fifth triennial meeting of IATUL has acquired a Scandinavian flavor in more ways than one. Of the nine papers presented, six were read by Scandinavian authors and dealt with Scandinavian experience in the provision of computer-based information services, with the remaining three consisting of one from each of the two Germanies and one from England.

Having said this, I should hasten to add that this observation implies no criticism but, on the contrary, is intended to indicate a coherent picture of experience and cooperation among Scandinavian libraries with sidelights from Germany and England showing how similar many of the problems are for all concerned—problems not just of technical detail but of costing and marketing, and of user education, none of which will be new to informed readers from other parts of the world.

What makes the experience of Scandinavian IATUL members of universal interest is that they serve a dual function as university libraries and as national central libraries of technology. Their national responsibility includes library and information services as well as user training, while current awareness needs of scientists and engineers are of necessity dependent on inter-Scandinavian and international cooperation.

Most of the papers emphasize developments at specific IATUL member institutions, while the paper from East Germany describes user education in the German Democratic Republic starting at the elementary school level. All papers are written in English, most are followed by useful lists of references, and the editor deserves a compliment for the well-summarized, often very enlightening, discussions which follow all but one of the papers.

In summary, I have found this an informative collection and my only negative criticism is that the book in its flimsy binding will hardly survive more than one thorough reading, which may be mitigated by the fact that these proceedings of a meeting held in June 1973, did not reach me until two years after the event when many of the experiences described will have been superseded by new developments.

R. J. Brongers
University of British Columbia

New York State Library Automated Serials Control System, by Elizabeth Pan. New York: The University of the State of New York, 1974. 116p. Free to libraries; $1.00 to individuals.

This report is a detailed description of a batch-mode tape-oriented serials management system which uses a Control Data 3300 computer. Programming language is not specified. The background, scope, objectives, and limitations of the system as well as functional module description are included. Input/output samples together with development and operational costs in man months and computer time (which appears to be stated in run time on/off the system) are also included.

The author's purpose is "to provide a description of the computer-based serials control system at the New York State Library (NYSL), to document the rationale behind the major design decisions underlying the system, and to draw some conclusions from the experience which may provide some insights to other libraries which are embarking, or plan to embark, on similar ventures." For the audience of librarians, analysts, and administrators, the report should fulfill its purpose, as it is well written, in nontechnical terms.

From the system as documented, this reviewer feels this system does not present an advance in the state of the art of

batch serials control, but rather a functionally integrated system certainly useful to the library in which it is used. Updating retrospective holdings manually, use of both positive and negative holdings statement forms purportedly to save space, and use of a check-in list and code forms for writing the check-in transaction prior to keypunching all represent non-state-of-the-art features. Several systems with which this author is familiar use encoded holdings which give individual character manipulation updating automatically, yet conserve space while permitting any degree of holding detail for both retrospective and current holdings. Such statements can also receive special output translation for library patron use. Use of a check-in list on which annotation for direct keypunching was also in use would save an intermediate encoding step. Output lists also lack such refinements as numeric insignificant zero suppression, but otherwise are well formatted.

With over nineteen man years of EDP personnel and 41.5 man years of library personnel over a four-year period invested in bringing this system to full operation, it appears to this reviewer that a practical system was realized, but that as a research effort little was achieved to further the design and technique aspect of serials management systems. Operational computer time reported used yearly appears high when contrasted to a comparable serials control system with which the reviewer is familiar. This system also runs on a CDC 3300, uses considerably more programming and data manipulation refinements, depends upon line printer listings rather than COM lists, employs sequential tape file emulation on disc, and has a file size of 7,500 records. Development of this system involved similar multiple file data collection and was done during a two-year period with one programmer, one keypunch operator, one librarian, and two man years of temporary conversion staff and became fully operational in 1968. It also was the maiden automation effort in its library. It is on this basis that the reviewer feels able to comment on this specific system.

Librarians and systems analysts contemplating integrated serials management should read this report and make their own comparisons with other functional systems reported in the literature in light of their particular library's needs.

Audrey N. Grosch
University of Minnesota Libraries

Changing Patterns in Information Retrieval; Tenth Annual National Information Retrieval Colloquium. Edited by Carol Fenichel. Washington: American Society for Information Science, 1974. 175p. $12.00 for members; $15.00 for nonmembers.

The Annual Information Retrieval Colloquium in Philadelphia had from the outset in 1964 a refreshing air about it. Organized by local chapters of the American Society for Information Science, Association for Computing Machinery, Special Library Association, and a number of other organizations, the colloquium managed quite well to avoid the tiresome formal trappings of a convention or miniconvention. Instead these were more like gatherings of a debating club, meant in the best sense of the notion of the debate. The general format was as follows: few formal written papers treated the chosen yearly topic in some depth; shorter panel papers reacted to the theme of the written papers. Plenty of time for panel and audience discussion was allowed. Informality raged. Critical attention was not too sharp; someone could stick his/her neck out much more comfortably than at a national meeting, and get away with it. The book reviewed here is the proceedings of the tenth Philadelphia Colloquium.

At the 1961 annual meeting of the American Documentation Institute (now ASIS), a symposium was held on the state of the art of the field, chaired by Claire K. Schultz. Four papers were presented and later published in *American Documentation.* That was the first review of achievements in a number of areas. That symposium led to the establishment in 1965 of the *Annual Review of Information Science and Technology* (ARIST) that is constantly providing comprehen-

sive overviews on a host of topics. The ingenious idea of the tenth colloquium was to follow and update the 1961 state-of-the-art symposium, to scan the achievements of the intervening years. A keynote address by R. S. Taylor was a philosophical attempt to lay groundwork for the needed work in the next decade. Four invited papers provided the summary of achievement in these topics: "User Behavior" (D. W. King and V. E. Palmour), "Strategies for Organizing and Searching" (M. E. Stevens), "Technology for Storage and Retrieval of Bibliographic Data" (L. Schultz), and "Information as a Product" (J. W. Murdock). Each of the invited papers was followed by three to four short panel papers as a discussion. However, the actual discussion is not presented in this book. The invited papers follow very much the now-established format of ARIST chapters with their strengths—comprehensiveness of coverage, excellent bibliographies, classification of work into related areas—and weaknesses—general lack of critical appraisal. They are excellent summaries, but they are not reviews, in the classic sense of word. We found out what went on, but we really don't know what we achieved. The difference is like that between chronology and history. The paper by M. E. Stevens on organization and searching went the farthest in the attempt to evaluate the achievements. Hers is a review of achievements in various types of indexing in the last decade or more. However, the authors are not to blame. The field of information science has not as yet succeeded in developing a tradition of critical appraisal. Oh, we have our share of brawls like any other field, but that is not critical appraisal.

Because of these four papers, this book is worth having, to be put on the shelf together with *ARIST* and used like *ARIST*. However, in the back of my mind there is a heretical thought. Meetings should be meetings and not proceedings, debates should be debates and not papers. Maybe it is time to stop publishing proceedings of meetings, to stop further polluting our communication ecology. Why not go back to that marvelous idea of the symposium in 1961: polish and publish the best papers as journal articles. The world will not be any poorer, nor will any science or any field suffer if proceedings of meetings were suddenly to disappear. This is not at all a reflection of the reviewed proceedings; this remark is quite general in its application.

Tefko Saracevic
Case Western Reserve University

INSTRUCTIONS TO AUTHORS

Scope. The *Journal of Library Automation* publishes scholarly papers and technical reports containing findings not published previously in the following fields: research and development in library automation, including inter-library communications; research in information science and educational technology directly related to library activities; and the history and teaching of these subjects. Each paper is accepted with the understanding that it is to be published exclusively in the *Journal of Library Automation,* unless some other specific arrangement is made in advance.

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2. ALA Library Administration Division, comp., *Library Statistics of Colleges and Universities, 1965–66 Institutional Data* (Chicago: ALA, 1967), p. 3.
3. Robert R. Freeman and Pauline Atherton, *AUDACIOUS; An Experiment with an On-Line, Interactive Reference Retrieval System Using the Universal Decimal Classification as the Index Language in the Field of Nuclear Science* (New York: American Institute of Physics, UDC Project, 25 April 1968), p. 36. AIP/UDC-7; PB-178 374.

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Indexed by Joan M. Aliprand.

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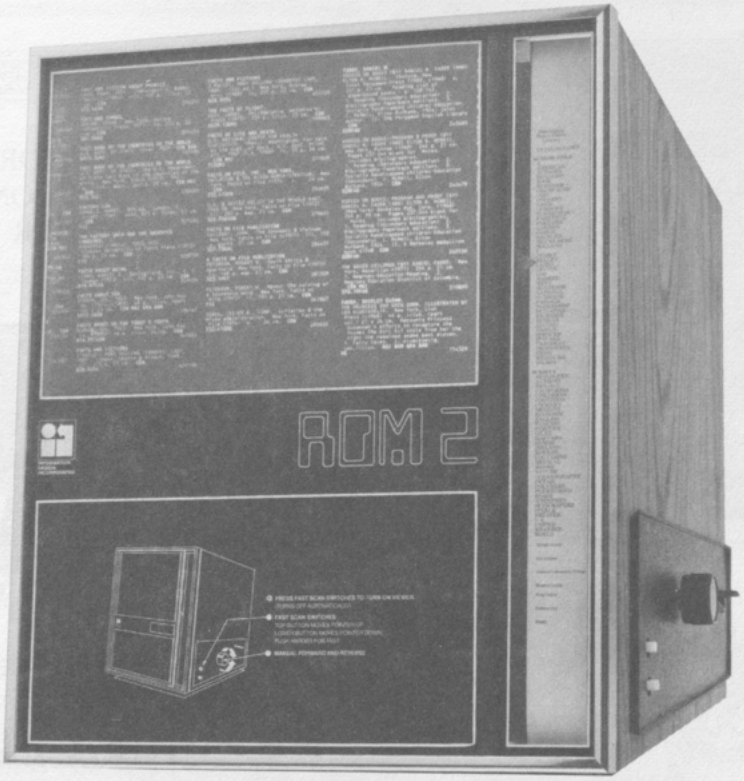

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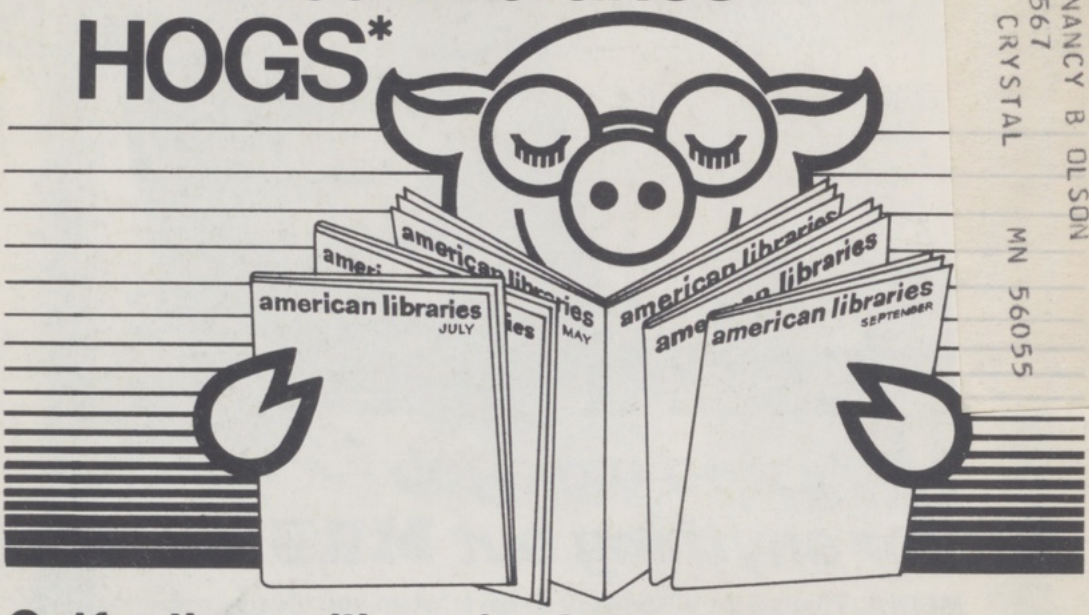

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