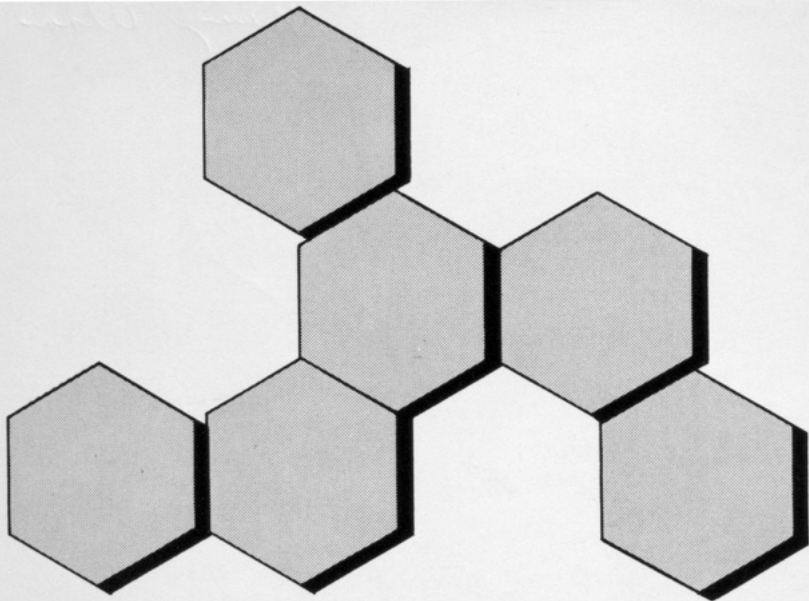


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march, 1979



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Annual Automated Circulation: 220,000

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Annual Automated Circulation: 206,031



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Creating an Agenda

Many success stories in library automation convey the impression that the installation of electronic equipment is an end in itself. Terminals, light pens, and printers are justified essentially in engineering terms—larger character sets, faster throughput, or more readable reports. Perhaps one should not complain. Not long ago peddlers of equipment could dump hardware in almost any corner of the library and then skip town, leaving others to puzzle over what went wrong. Nowadays we have established some measure of discipline over the implementation process. When something isn't right, the underlying assumptions and rationale can at least be found and scrutinized. But it seems to me that this is not enough. In our preoccupation with machinery we seem unwilling to say what part library automation ought to play in larger organizational and social terms. How do we want it to affect libraries and librarians? In short, what is our overall automation agenda and what future do we see?

The items on that agenda should be broadly drawn. For example, it is often said that automation centralizes power, authority, and control. Indeed computers have often been consciously used to do precisely that. But with new forms of distributed processing available, centralization is no longer an unavoidable consequence. We now have options. It is not simply idle talk for us to discuss what automation should do to the power structure and controls. What do we *want* automation to accomplish in this respect?

Another example touches on the library's role. Some people believe that the role of the library will be gradually whittled away by publishers and broadcasters. And they see automation, in the form of the personal computer, as a step down that road. Others envision the library's role as an expansive one. They expect a great variety of community services offering advice and referral to be centered in the library. In this case, automation will again be a partner in helping the library redraw its boundaries and provide these new services adequately and well. These positions are miles apart. Once again, it seems to me the question is, Where do we *want* the institutional boundaries to be, and are we building systems to fit those boundaries?

A third example deals with the delicate balance between automation and jobs in the library world. Some people seem to feel that the powerful technologies of the future will provide a shoebox library for everyone, and that many of the jobs that now exist in libraries will disappear or be radically changed. Yet others point to the overwhelming need for information-related skills as we cross the threshold into an information age. Given this, automation can be a powerful stimulus and source of new jobs in the library field. Both these futures cannot be realized. But once again, it is time we brought some judgment to bear on just what part we *want* library automation to play in our professional lives.

If we begin discussing some of these agenda items, we will no doubt discover that we are not all praying in the same house of worship. We all have different visions of the future and different ideas about what to do once we arrive. On the other hand, if we don't talk about the different visions, it will take much more than a leap of faith to get us there.

WILLIAM D. MATHEWS

Building an On-Line Bibliographic/MARC Resource Data Base for Machine-readable Data Files

Sue A. DODD: Institute for Research in Social Science, University of North Carolina, Chapel Hill.

The Social Science Data Library of the Institute for Research in Social Science at the University of North Carolina is currently engaged in some unique developmental work to create a multipurpose bibliographic data base of machine-readable data files (MRDF) according to the new internationally acceptable cataloging codes (AACR 2) and according to the MARC II format developed by the Library of Congress. A test data base has been converted to an on-line interactive mode and is currently operational within a network environment. The purpose of this paper is to briefly explain how this bibliographic data base for MRDF was conceived and how such an informational resource would benefit the general user and the professional librarian.

INTRODUCTION

Numerical and textual data files such as those used in teaching and scholarly research have had an unprecedented growth in the last decade; and with the advance of small, relatively inexpensive computer terminals, data analysis and computer simulation models have moved into the classroom as legitimate instructional tools. Specialized files, often referred to as "educational data packages," have been developed to teach students analytical skills in order to better understand social and economic phenomena. According to Nesvold, "Experience with machine-readable 'laboratory' materials should be as appropriate to the beginning social science student as is the laboratory for the beginning chemistry student."¹ Until recently, these valuable teaching resources were available only to students and faculty at large research universities with associated archives and computer centers. Now, remote access within a network environment makes possible the sharing of these computer programs and educational data packages on a broader spectrum including the smallest of schools.

Unfortunately, many such data resources are not fully utilized because potential users are unaware of their existence and accessibility. Information on usable machine-readable data files (MRDF) is fragmented among government agencies, research institutions, and university computing and data centers. Among these agencies, there is no common format for information on the existence of data files, nor is there any standardized structure that would facilitate retrieval of information from many different sources. Before satisfactory dissemination of information on the existence and availability of educational data resources can take place, some controls must be exercised over the information describing this new medium. The library profession has affected bibliographic control on monographic and serial publications by means of descriptive cataloging and indexing procedures that have been firmly established over many years. Descriptive cataloging rules for MRDF are just now being established and appear in the second edition of the *Anglo-American Cataloguing Rules (AACR 2)*. The AACR 2 rules appear at a time when the traditional card catalog is being phased out and replaced by an automated catalog of records. The transition to a computer organization of cataloging and bibliographic information provides, in turn, for on-line and remote access to information by a variety of access points heretofore not possible and for the generation of printed products in many different formats.

The Social Science Data Library of the Institute for Research in Social Science at the University of North Carolina at Chapel Hill is currently engaged in some unique developmental work to create a bibliographic data base of machine-readable data files* according to the new internationally acceptable cataloging codes and according to the MARC II record format developed by the Library of Congress. A test data base had been converted to an on-line interactive mode and is currently operational within a network environment.

The purpose of this article is to explain briefly how this bibliographic/MARC data base was conceived and how such an informational resource would benefit the general user and the professional librarian. Topics of discussion include the potential users within this network community, special products that can be generated from the bibliographic data base, the logical and physical structure of the file, the current on-line interactive retrieval capabilities, and the special advantages to librarians.

TUCC NETWORK COMMUNITY

The bibliographic data base of MRDF under discussion here includes

*The author wishes to acknowledge the assistance of noninstitute staff who contributed to the development of the bibliographic/MARC data base: Jeff Huestis, Cilla Kaplan, James McClure, Nancy Norton, Leslie Pearse, and Christie Stephenson.

information on data sources supplied by members of the TUCC (Triangle Universities Computation Center) network community. This community represents a wide and diverse set of users with varying degrees of sophistication in the areas of education, research, and commercial enterprises. TUCC may be defined as a "star network" built around a central computer facility that is owned, operated, and shared by North Carolina's three major universities—University of North Carolina at Chapel Hill, Duke University, and North Carolina State University. TUCC maintains a small service staff, but most of the informational operations are carried out by the respective Computation Center user services and by contact persons throughout the network system representing libraries, data centers, academic departments, state government agencies, and research organizations. Users outside the three major universities must purchase computer time from TUCC. Three very important commercial users of TUCC are North Carolina Science and Technology Research Center, Research Triangle Institute, and North Carolina Educational Computing Service (NCECS).

NCECS retails computer time from TUCC to forty-eight colleges and universities (as well as ten high schools) throughout the state. This regional network is the largest of its kind in the United States and has developed special expertise in the support of computer-based education and research. In addition, NCECS is a member of EDUNET[†] and, as such, can offer their clients access to data resources and computer programs available at a national level. Conversely, members of EDUNET would technically have access to the bibliographic/MARC data base of computerized data files.

There are at least three types of potential users of this resource within the TUCC/NCECS network community: (1) the academic user who is looking for potential sources of data for educational purposes or for scholarly research; (2) user service personnel at computing centers who act as information brokers to other end-users within the network system; and (3) libraries and data centers who would use the system as an on-line bibliographic resource data base for clients and as a shared cataloging and record management system.

COMPUTER GENERATED PRODUCTS

The bibliographic/MARC data base for MRDF was conceived with several applications and computer-generated products in mind. It was designed to produce products and services for which a significant need had been foreseen. Consequently, the logical file structure and the file creation procedures were largely determined by these perceived needs.

[†]EDUNET is a national network of colleges and universities formed to promote the sharing of computer-based resources in higher education. Formed in 1974, it is administered by the Planning Council of EDUCOM—a nonprofit organization established to further cooperative efforts among institutions of higher education.

Some of the products that have been generated from the MRDF data base are discussed below.

MRDF Master File

The MRDF master file is characterized as a complete inventory of full bibliographic records. A sample record representing a typical data file includes the following informational components: author; title; title responsibility statement; edition statement; place, organization, and date of production; place, organization, and date of distribution; size of file (e.g., number of logical records or units of information); unique identification or classification codes; abstract or summary of contents; geographic focus; subject descriptors; index terms; time coverage; methodology; access information; and appropriate contact person. Each of these fields of information has been designed to provide for a variety of access points and arrangements.

Possible *access points* to the information stored in the master file include author, title, subject, geographic focus, time coverage, data producer or distributor, physical location of the data base, and contact person. Possible *arrangements* of the master file include author, title, subject, or combination "dictionary" listing; academic disciplines; geographic focus; type of file (e.g., cartographic data, bibliographic data, statistical data, computer software); and Library of Congress subject headings (see figure 1).

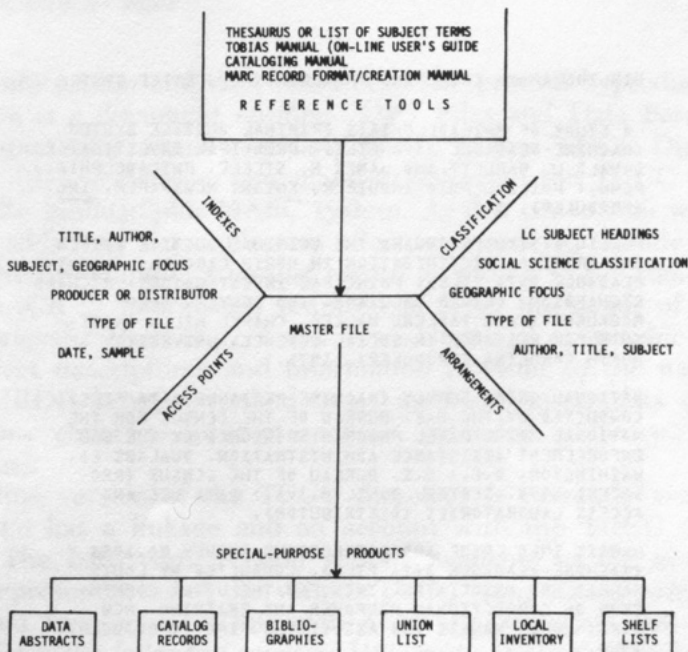


Fig. 1. Master File and Related Products.

Subject Bibliographies

Once the bibliographic components for MRDF have been appropriately tagged and stored in the automated master file, they can then be manipulated for a variety of uses, including generating subject bibliographies. An example of a special bibliographic listing of MRDF in the area of crime and corrections is listed in figure 2.

Catalog Records

At the present time, cataloging information according to the second edition of the *Anglo American Cataloguing Rules* for MRDF is not readily available through any library network system. Consequently, a deliberate decision was made to collect and input the information required to compile an acceptable AACR II catalog entry into the bibliographic/MARC data base. Once in this automated format, the report generation software has the capability of producing these catalog entries in many formats, including on-line display, hard copy print, microfiche, and the standard three-by-five perforated card stock for easy integration into existing catalog files (see figure 3).

Union Lists

When two or more parties join together to share resources, a resulting record of these shared resources is called a "union list." Similarly, in the TUCC network environment, several organizations join together

BIBLIOGRAPHY: CRIME AND THE CRIMINAL JUSTICE SYSTEM

A STUDY OF PHILADELPHIA'S CRIMINAL JUSTICE SYSTEM {MACHINE-READABLE DATA FILE}. PRINCIPAL INVESTIGATORS: DONALD L. BARLETT AND JAMES B. STEELE. PHILADELPHIA, PENN.: PHILADELPHIA INQUIRER, KNIGHT NEWSPAPER, INC. {PRODUCER}, 1972.

PUBLIC ATTITUDES TOWARD THE CRIMINAL JUSTICE SYSTEM AND CRIMINAL VICTIMIZATION IN NORTH CAROLINA {MACHINE-READABLE DATA FILE}. PRINCIPAL INVESTIGATORS: RICHARD RICHARDSON, OLIVER WILLIAMS, TOM DENYER, SKIP MCGAUGHEY, AND DARLENE WALKER. CHAPEL HILL: INSTITUTE FOR RESEARCH IN SOCIAL SCIENCE, UNIVERSITY OF NORTH CAROLINA {PRODUCER}, 1971.

NATIONAL CRIME SURVEY {MACHINE-READABLE DATA FILE}. CONDUCTED BY THE U.S. BUREAU OF THE CENSUS FOR THE NATIONAL CRIME PANEL PROGRAM SPONSORED BY THE LAW ENFORCEMENT ASSISTANCE ADMINISTRATION. DUALABS ED. WASHINGTON, D.C.: U.S. BUREAU OF THE CENSUS {PRODUCER}, 1972. SERIES. ROSSLYN, VA.: DATA USE AND ACCESS LABORATORIES {DISTRIBUTOR}.

HARRIS 1968 CRIME AND CORRECTIONS SURVEY NO. 1758 {MACHINE-READABLE DATA FILE}. CONDUCTED BY LOUIS HARRIS AND ASSOCIATES, INC. FOR THE JOINT COMMISSION ON CORRECTIONAL MANPOWER AND TRAINING. NEW YORK: LOUIS HARRIS AND ASSOCIATES, INC. {PRODUCER}, 1968.

Fig. 2. Bibliography of MRDF.

Davis, James Allan
 General social science survey, 1972-1978 [machine-readable data file] ; cumulative data / principal investigator, James A. Davis; Associate Study Director, Tom W. Smith; Research Assistant, C. Bruce Stephenson ; conducted for the National Data Program for the Social Sciences at the National Opinion Research Center. -- NORC ed. -- Chicago : National Public Opinion Research Center, Yale University [distributor], 1978.
 1 data file (10,652 logical records) + codebook (340p.).
 Title supplied by the producer.

(continued on next card)

Davis, James Allan
 General social science survey, 1972-1978 . . .

Summary: This cumulative data file merged all seven surveys into a single file with each year or survey acting as a subfile. This arrangement of the data facilitates trend analysis on repeated questions of social concern over a seven year period.

I. Social surveys - U.S. 2. Public opinion - U.S. I. Smith, Tom W. II. Stephenson, C. Bruce. III. National Opinion Research Center. IV. Title.

Fig. 3. Catalog Entry for MRDF.

to share information and data resources. The printed byproduct of this cooperation is a document entitled "Data Files and Data Bases in the TUCC Community" (more popularly known as the "TUCC Directory"). In March 1977, a decision was made to automate the TUCC directory utilizing the bibliographic/MARC system. As this conversion was taking place, an additional data collection effort was made to include information required to compile a catalog record according to the standards set forth in AACR 2; information required to meet the needs of an automated retrieval system (e.g., index terms, levels of geographic aggregation, subject descriptors); and information relevant to the nature and kind of MRDF being described (e.g., methodology or data collection efforts, time coverage, unit of analysis, intended audience, research applications).

An on-line version of the TUCC directory is currently available to anyone who has a linkage and an account with the TUCC computer facilities. The hard copy version will be available in the near future through representatives of the various TUCC computation centers. The on-line data base contains information on approximately 300 available data files from the following sources: University of North Carolina; Duke University; North Carolina State University; North Carolina Educational

Computing Service; North Carolina Science and Technology Research Center, and Research Triangle Institute. A sample MRDF entry in the TUCC directory is shown in figure 4.

Local Inventories

The TUCC master file contains a complete inventory of bibliographic records for all the holdings of the participants. However, the respective organizations within the cooperative TUCC union can generate separate listings of their exclusive holdings. Such a local inventory is helpful as an in-house record-keeping tool as well as a bibliographic listing of data at other locations. Useful shelflists, such as an authority list of titles and series, can also be generated from the master file.

LOGICAL FILE STRUCTURE

The logical file structure for the bibliographic/MARC data base for MRDF was formulated on a scheme that conceptualizes three related informational levels. The highest level includes those bibliographic elements required to uniquely identify the particular file, for example, study number, title, author, edition, place, organization, date of production and distribution, series identification, size of file, abstract, and descriptors. This has been designated the *universal level* of information, since it is compatible with existing international standards for bibliographic references and cataloging. The middle level of information in-

PHYSICAL SCIENCE DATA FILES

7. Soil survey and land-cover data for Durham, Orange, and Wake Counties

AUTHOR: Triangle "J" Council of Governments
PRODUCER: Triangle "J" Council of Governments, Research Triangle Park, NC, 1976

DESCRIPTION: This file is a merger of soil and land-cover data for a one-million-acre area covering Durham, Orange, and Wake Counties, and including parts of Chatham, Lee, and Johnston Counties, North Carolina. The area is divided into a grid of ten-acre cells. Each record of the file gives the predominant soil type and land-cover data for one cell of the grid. The soil information was taken from the U.S. Dept. of Agriculture Soil Survey. The land-cover data were provided by the infra-red photographic techniques of the NASA Landsat satellite program.

FILE CHARACTERISTICS: Medium: disk; Location: TUCC

AVAILABILITY: Available to all users

CONTACT PERSON: Al Carlson
Triangle "J" Council of Governments
P.O. Box 12276
Research Triangle Park, NC 27709
(919) 549-0551

Fig. 4. Sample MRDF Entry in the TUCC Directory.

cludes data elements required to analyze the file, such as sample design, unit of analysis, number of data units, time coverage, geographic level of aggregation, related software, and file structure. This is called the *analytical level* of information and would vary depending on the type of file or the special characteristics of the file. The combination of the *universal* and *analytical* levels of information would be sufficient to generate a MRDF Study Description or Data Abstract, such as those that are compiled by major data producers and data archives. The lowest level of information consists of those bibliographic elements that are variant in nature, such as the condition of the file, the location of the MRDF, the physical characteristics of the file, restrictions on the use of the file, and the appropriate contact person or agency. This has been designated as the *local level* of information, since it is dependent on special conditions, local options, in-house applications, computer facilities—all of which are subject to change. The *universal* level has been flagged as being essential information for a MRDF bibliographic record, while the *analytical* and *local* have been flagged as “recommended” and “optional,” respectively (see figure 5).

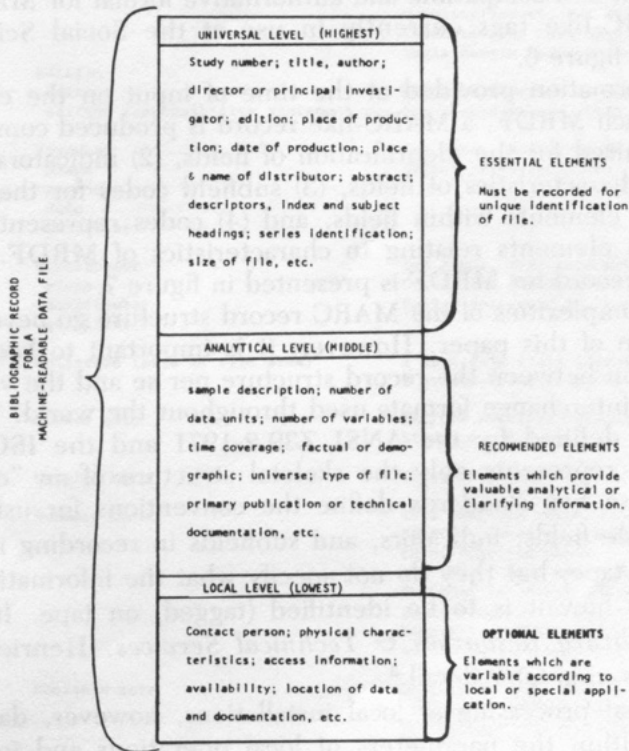


Fig. 5. Logical File Structure for the Bibliographic/MARC Data Base for Machine-Readable Data Files.

PHYSICAL FILE STRUCTURE

The physical file structure is based on the Library of Congress MARC II format. MARC is an acronym derived from the phrase *MACHine Readable Catalog*. It is a "generic term referring to bibliographic information that has been encoded and transcribed into a machine-readable form to permit its manipulation. . . ."² The MARC format is the coding convention under which MARC data may be organized, and it is fast becoming the international standard for automated bibliographic representation. The essential characteristics of MARC formatted records is that they can accommodate a varying number of variable-length data items—affording considerable generality of use.

Each field of information (or bibliographic component) is associated with a three-letter code called a "mnemonic tag." With regard to MRDF and the bibliographic/MARC data base, an effort has been made to be compatible with the Library of Congress MARC tags that already exist for other media. However, because MRDF are considered to be a new medium, certain unique tags for MRDF must be developed. The author is currently working with the MARC Development Office of the Library of Congress to prepare the groundwork necessary for the future establishment of a compatible and authoritative format for MRDF. For a list of MARC-like tags currently in use at the Social Science Data Library, see figure 6.

From information provided at the time of input on the content and context of each MRDF, a MARC-like record is produced complete with: (1) tags required for the identification of fields, (2) indicators to further define the characteristics of fields, (3) subfield codes for the identification of data elements within fields, and (4) codes representing certain specific data elements relating to characteristics of MRDF. A sample MARC-like record for MRDF is presented in figure 7.

Further complexities of the MARC record structure go beyond the intended scope of this paper. However, it is important to keep in mind the distinction between the record structure per se and the various conversion and interchange formats used throughout the world. The record structure is defined by the ANSI Z39.2-1971 and the ISO standard 2709, but it represents only the skeletal structure of an "empty container." These two standards define the conventions for using control fields, variable fields, indicators, and subfields in recording information on magnetic tape, but they do not specify what the information content is to be nor how it is to be identified (tagged) on tape. In a recent article in *Library Resources & Technical Services*, Henriette Avram discusses this in greater detail.³

For internal processing at local installations, however, data may be processed within the parameters of local operations and in whatever format that is most appropriate for the respective computing equipment.

This same information may then be converted to the ANSI/ISO format for possible delivery to another organization. These organizations would, in turn, convert the received tapes into whatever format is most appropriate for their own internal use. The ANSI/ISO standards are specifically intended for *information interchange* purposes. For example, the data bases from the abstracting and indexing services are routinely converted to and from interchange formats, and some of them have adopted the ANSI/ISO standards for the interchange tape format. As with other media, the methods of recording bibliographic information on available

MNEMONIC TAG	DESCRIPTION OR FIELD NAME	EXAMPLES
D I D	Document identification number	D-445
C A L	LC call number	HB942.D365A51970
M E N	Personal or corporate author	Campbell, Angus, et.al.
T I L	Title & Statement of Responsibility	Productive Americans:#
a	title	A study of how individuals contribute to economic progress#Principal Investigator: James N. Morgan
b	subtitle	(or)
c	title responsibility statement	Harris 1969 Science, Sex and Morality Survey, no. 1927# Conducted for Life Magazine by Louis Harris and Associates, Inc.
E D N	Edition	
a	edition	NCECS ed.#Revised by Nancy Moxley
b	edition responsibility statement	for classroom use, 1976.
P R O	Producer	Ann Arbor, MI#Survey Research Center ;#1971#producer
a	place	
b	producer	
c	date	
d	qualifier	
D I S	Distributor	Ann Arbor, MI#Inter-University Consortium for Political and Social Research# distributor
a	place	
b	distributor	
c	qualifier	
C O L	Collation (Size of file area)	1 data file (1514 logical records) + accompanying codebook (135 p.)
S E T	Series note	SRC/CPS American National Election Study, no. 6
N O G	General note	Title from codebook
N O S	Summary note	This American panel study provides data for panel analyses across three election years - 1956, 1958, and 1960. Each election study was designed to obtain information about general political attitudes and behavior as well as those related to the current election.
N O C	Contents note	Section A. SRC 1956 election study Section B. SRC 1958 election study Section C. SRC 1960 election study Section P. Panel study.

Fig. 6. List of MARC-like Tags Used in the Bibliographic/MARC Data Base for MRDF.

	<u>MNEMONIC TAG</u>	<u>DESCRIPTION OR FIELD NAME</u>	<u>EXAMPLES</u>	
BIBLIOGRAPHIC CARD RECORD	N M E	Name added entry	Converse, Philip, joint investigator	
	T I E	Title added entry	Title.	
	S U L	LC Subject headings	Elections - U.S. - Public opinion	
	S E E	Series added entry	Series.	
ADDITIONAL DATA FILE INFORMATION	C B N	Codebook/documentation number	37-9	
	S T N	Study number	37-01-7252-ICPSR-60	
	V A R	Number of variables	843 variables	
	T I M	Time period of data coverage	1956, 1958, 1960	
	S P L	Sampling procedures	National sample	
	U N I	Universe or population or unit of analysis	U.S. adults of voting age	
	D A T	Type or kind of data	Panel study (three waves)	
	F A C	Factual or demographic info.	age, sex, race, etc.	
	S U T	Thesaurus or descriptor terms	Elections, voting behavior, etc.	
	G E O	Geographical terms	Alabama	
ADDITIONAL PROGRAM INFORMATION	A B S	Abstract	(A summary of the data more detailed than one contained in the NOS tag)	
	R E P	Report	Converse, Philip E., "Nature of Belief Systems in Mass Publics," David Apter (ed.), <u>Ideology and Discontent</u> , Free Press, 1964.	
	T O F	Type of file	<u>computer graphics and mapping program</u>	
	P R L	Program language	P1/1	
	M A C	Machine (computer) compatibility	IBM 360	
	U P D	update information	program updated regularly	
	ACCESS INFORMATION	F I L	File characteristics	Medium: tape#Format: OSIRIS#
		a	medium	Location: TUCC
		b	format	
		c	location	
C O N		Contact person	Sue A. Dodd, Data Librarian#Louis Harris Data Center# Manning Hall, UNC - CH 026A#Chapel Hill, NC 27514#(919) 933-3061	
a	person and title			
b	organization			
c	street address			
d	city, state and zip code			
e	phone number			
D O C	Format and location of documentation	printed codebook-Social Science Data Library, Room 14, Manning Hall/ UNC-CH		
A C C	Access information	Refer to contact person		
A V B	Availability	available to members of ICPSR		

Fig. 6 (cont.). List of MARC-like Tags Used in the Bibliographic/MARC Data Base for MRDF.

did L-2
 tof Social science data file
 menc Community Drug Education Center, Inc.
 nme Institute of Government, UNC-CH
 til#ac Mecklenburg County school drug survey#From a study conducted by
 the Community Drug Education Center, Inc. of Charlotte, NC, and
 Gloria A. Grizzle, Institute of Government, UNC-CH
 edn# SPSS edition
 pro#abc Durham, NC#Data Services#1972
 pro/2#bod Data Entry#1974#producers
 dis#abc Raleigh, NC#Gloria A. Grizzle#distributor
 set#ab Institute of Government Survey Series#13
 stn A-045-NC
 rep McLeod, Jonnie H. and Grizzle, Gloria A. CORRELATES OF DRUG
 USAGE AMONG JUNIOR AND SENIOR HIGH SCHOOL STUDENTS IN
 CHARLOTTE-MECKLENBURG. Chapel Hill: Institute of Government,
 1972.
 rep/2 McLeod, Jonnie H. and Grizzle, Gloria A. ALCOHOL AND OTHER
 DRUG USAGE AMONG JUNIOR AND SENIOR HIGH SCHOOL STUDENTS IN
 CHARLOTTE-MECKLENBURG. Chapel Hill: Institute of Government,
 1972.
 tie Title
 see Series
 not Title supplied by distributor
 nos This file contains the responses of junior and senior high school
 students to a questionnaire administered in Charlotte, NC, as a
 part of the Mecklenburg Criminal Justice Pilot Project conducted
 by Gloria A. Grizzle for the Institute of Government at Chapel
 Hill. The Project was funded by a grant from the National
 Institute for Law Enforcement and Criminal Justice of the United
 States government. The questionnaire was designed by Gloria
 A. Grizzle and the Community Drug Education Center, Inc., of
 Charlotte, NC, to obtain measures of drug usage and drug knowledge,
 demographic data, and measures of attitudes toward family, school,
 and society. The population was surveyed in March, 1972, and
 again in March, 1974.
 noc Part A. 1972 survey. Part B. 1974 survey.
 sul Drugs and youth - Mecklenburg County, NC - Statistics
 sui Drug survey, Mecklenburg County, NC
 sut Junior high school students
 sut/2 High school students
 sut/3 Mecklenburg Criminal Justice Pilot Project
 sut/4 Institute of Government at Chapel Hill
 sut/5 National Institute for Law Enforcement and Criminal Justice
 sut/6 Drug usage
 sut/7 Drug knowledge
 sut/8 Demographic data
 sut/9 Attitudes toward family
 sut/10 Attitudes toward school
 sut/11 Attitudes toward society
 con#abodef Gloria A.#Grizzle,#Assistant Director for data collection
 #North Carolina State Budget Office#116 W. Jones St.#Raleigh,
 NC 27603#(919) 733-7061
 avb Available to all members of the TUCJ community
 fil#abc Medium; tape#Format: SPSS#Location: TUCJ
 doc#acd Codebook#Institute of Government Data Library#0-396-07389-1
 dat Longitudinal study
 uni Junior and senior high school students in Mecklenburg County, NC
 spl Cluster sampling with quotas for age, grade level, sex
 res 1972: 3,299; 1974: 3,050
 van 1972: 75; 1974: 77
 tim 1972, 1974
 fac Age
 fac/2 Sex
 fac/3 Grade level in school
 geo Charlotte, NC
 adm Community Drug Education Center, Inc., Charlotte, NC

Fig. 7. Sample MARC-like Record Input.

MRDF should conform to existing standards, especially if the objective is to disseminate the resulting information to the widest possible audience.

COMPUTER SOFTWARE AND ON-LINE RETRIEVAL CAPABILITIES

The multipurpose software programs utilized in the processing of the bibliographic/MARC data base for MRDF were compiled by the Carolina Population Center's Technical Information Service Library and were originally designed by the Library of Congress. These local programs are collectively called the Automated Library System (ALS). The internal processing capabilities of the ALS lie primarily in the areas of information storage, retrieval, and report generation, with additional programs allowing for automated thesaurus construction and interactive subject retrieval system. Complementing this software is an on-line interactive retrieval program called TOBIAS (Terminal Oriented Bibliographic Information Analysis System). TOBIAS was designed locally and has been extensively revised by members of the Institute for Research in Social Science programming staff. TOBIAS uses simple English language and appropriate commands, provides prompting and on-line tutorial instruction, incorporates set theory and boolean logic procedures, displays information on-line and prints information off-line, which can be received at various destinations. An example of a sample query search using TOBIAS is illustrated in figure 8.

SPECIAL ADVANTAGES TO LIBRARIANS

The relationship between on-line technology and library functions, including how on-line technology has contributed to significant changes in the quality and amount of services provided by the library, is well defined in a recent paper by Meriam Drake of Purdue University.⁴ Drake points out that in addition to on-line technology allowing libraries to communicate with each other, it has also had an impact on such library functions as "collections building, order processing, accounting, cataloging and user services." The bibliographic/MARC data base for MRDF was designed to facilitate many of these library-related functions.

Cooperative Collection Building

More and more libraries are entering into planned and cooperative resource sharing, thus eliminating the cost of duplicate collections of the same works. The same will be true of MRDF. In the case of the TUCC community, three major universities share the same computer facility and store their MRDF in the same building. Physical storage space of these files on magnetic tape reels is a serious problem. If Duke University is collecting MRDF dealing with Canadian studies, there would be no reason for the University of North Carolina at Chapel Hill to dupli-

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QUERY 2
ENERGY AND PUBLIC POLICY
  2 TERMS:      1 DOCS FOUND
TOBIAS:D
****D-37
HUGHES, BARRY
  PUBLIC POLICY: U.S. ENERGY, ENVIRONMENT, AND ECONOMIC
  PROBLEMS (MACHINE-READABLE DATA FILE). - ICPR TEST ED. -
  WASHINGTON, D.C. ; AMERICAN POLITICAL SCIENCE ASSOCIATION,
  1974 ; ANN ARBOR, MICHIGAN ; INTER-UNIVERSITY CONSORTIUM FOR
  POLITICAL RESEARCH.
  1 DATA FILE (605 LOGICAL RECORDS) + ACCOMPANYING
  CODEBOOK (49P). - (SETUPS NO. 6).
  TITLE FROM CODEBOOK.
  SUMMARY: ONE IN A SERIES OF SEVEN LEARNING PACKAGES
  DESIGNED TO BE USED PRIMARILY IN AMERICAN GOVERNMENT CLASSES
  TO SUPPLEMENT THE TEXT AND GIVE BEGINNING STUDENTS
  EXPERIENCE IN DATA ANALYSIS. SUBSTANTIVE AND OPERATIONAL
  MATERIAL IS PROVIDED IN THE FORM OF A PUBLIC POLICY MODEL
  AND SPECIFIC DECISION-MAKING ON ENERGY ENVIRONMENT AND
  ECONOMIC ISSUES. A COMPUTER SIMULATION MODEL (SUBSYSTEM) IS
  ALSO PROVIDED WITH THE PACKAGE.
TOBIAS:E
CONFIRM ENB: ENTER 'END' OR ANY COMMAND OR QUERY
TOBIAS:E
END CONFIRMED

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Fig. 8. Sample of On-Line Search of the Bibliographic/MARC Data Base for Machine-Readable Data Files.

cate this collection effort. The bibliographic/MARC data base would facilitate such cooperative arrangements by providing information on available MRDF in a particular subject area, plus citing the neighboring institution that holds these files.

Cataloging

With the advent of AACR 2 and the resulting rules for cataloging MRDF, more libraries will join existing ones (such as Princeton, UCLA, Yale, and the University of British Columbia) in the cataloging of this new medium. If this information is recorded in an automated format and subsequently made available to others in an on-line network environment, then the duplication of cataloging efforts can be eliminated and shared cataloging can take place.

Acquisitions

One of the major complaints on the part of potential users of MRDF is that accurate information on available computer-readable resources is difficult and time-consuming to ascertain. The existing nonstandardized bibliographic descriptions of many of these files contribute to this problem. Cataloging MRDF according to acceptable standards will be an important step toward rectifying this situation; and by converting this same information to an on-line format within a network environment, the acquisition process will be made easier, titles and sources may be verified, and the accessibility of information on available MRDF will be greatly expanded.

The bibliographic/MARC data base provides additional information that assists the decision-making process associated with MRDF and subsequent ordering of computerized files. Such information includes unique identification codes, or "study numbers," which may not be part of the cataloging information; most recent update of the file; presence of system-file arrangements such as SPSS or SAS; type of file (e.g., text, numeric, computer graphics); unit of analysis; methodology or source of information; restrictions on use; dependency on type of computer or related software; and the complete address and telephone number of the appropriate contact person.

Remote Access to MRDF and Related Reference Service

On-line technology has brought computer terminals into libraries for the purpose of gaining access to information stored at a remote location. Just as a library patron would seek the assistance of a reference librarian to search an on-line bibliographic data base for information on printed documents within a particular area of interest, the library patron seeking information on available MRDF could be provided with the same service.

Once the availability of a particular MRDF had been determined, the potential user would then need to know the contents and the arrangement of the file. This information is normally provided in a printed document external to the file and is termed in the collective sense as "documentation." This author anticipates that libraries will purchase and catalog MRDF documentation without necessarily purchasing at the same time the actual data file. It would be entirely feasible for libraries to provide patrons with copies of printed documentation associated with an MRDF that is maintained and processed at a campus computer facility or at another remote location.

Much of the scholarly and educational research today depends to a large extent on the use of MRDF. As the amount of valuable and needed information stored in computer-readable form increases, so will the demand by library patrons for access to this information. Several academic libraries have already begun to coordinate the collection of MRDF and to provide expanded reference service. Conger, in an excellent paper, relates the MRDF collection effort and data reference approach taken by the Social Science Library at Yale University.⁵

CONCLUSION

The work described here is still in the developmental stage, but it is designed to be a prototype that can be expanded and implemented by other parties. Building a bibliographic/MARC data base for MRDF to operate in an on-line network environment opens up exchanges of information and data access that have not previously existed; and building this data base according to existing library standards for bibliographic

representation, the potential audience is extended to include any user of a library resource.

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Sue Dodd has a broad interest in developing network access to information on available machine-readable data files. She is currently working on a document that interprets AACR 2 rules regarding the description of data files.

Automation at the University of Georgia Libraries

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The University of Georgia Libraries have developed a technique to manipulate data to support a completely integrated automation system, MARVEL (Managing Resources for University Libraries). MARVEL covers all acquisitions and circulation functions for all types of material, including periodicals, serials, and monographs, and complements the cataloging function through the libraries' participation in OCLC through SOLINET. Although the data base is not arranged in the MARC format, procedures have been developed that allow it to accept MARC input from OCLC and LC MARC tapes. The finished system is oriented toward the public user and is therefore based on the concept of self-service and usage of seminatural language.

BACKGROUND

The major question concerning the automation project at the University of Georgia Libraries (UGAL) was "how?" rather than "why?" The why was obvious. Previous studies, including the major publication on the economics of libraries William J. Baumol's and Matityahu Marcus' *Economics of Academic Libraries*, showed quite clearly that the unit cost for library services tends to rise far more rapidly than the general price level in times of inflation.¹ At the same time, the cost-performance ratio for computer equipment has improved drastically during the last twenty years. Baumol and Marcus concluded that "electronization of a significant portion of library operations . . . in some cases may become unavoidable. For, with a time path of costs such as the libraries have experienced, not much time is required before the use of some conventional methods is priced out of consideration." Both the director of UGAL and the university's administration agreed that these trends were likely to continue.

After a full year's deliberation it was decided to design an integrated on-line system in-house. The decision was not made lightly. There has always been a controversy between the proponents of "total" or "inte-

grated" systems and proponents of functionally modular systems. Everyone at UGAL felt strongly that functional, but incompatible, systems would not offer sufficient cost savings to be acceptable either to the libraries or the university's administration. Many functional systems were investigated, but none offered the open-endedness that was required, if they were later to be combined into one system. One commercial system was even tested at the University's Office of Computing Activities (OCA), as it promised to be a total system with some local modifications. The system failed and was subsequently withdrawn from the market by the manufacturer.

As Stephen Salmon points out in his *Library Automation Systems*, it has never been quite clear what the definition of a fully integrated system is.² Some proponents automatically include cataloging in the concept, others talk about integrated technical processing systems, but exclude the cataloging function. At UGAL all technical service functions and all circulation functions were included but the traditional cataloging function was excluded from the beginning. There were two reasons for this decision. One was political as well as practical. SOLINET was just beginning to install OCLC terminals in the Southeast, and UGAL realized that it was economically advantageous to join OCLC as soon as possible. After all, the OCLC system was well established, whereas an in-house cataloging system would take years to develop and implement. The other reason was more philosophical. In order to attack the problems inherent in any total system design, it was deemed best to start with a clean slate, without being bound to the MARC format, as MARC had been designed for a specific purpose—cataloging—and did not lend itself to record-keeping for other functions, such as ordering, receiving and accounting.

When the decision to design an in-house system had been made, UGAL arranged with the OCA and IBM jointly to design the system and produce documentation to support it. An initial system design report³ was presented to the director of libraries and the university's administration in December 1974, followed a year later by a detailed system design document.⁴ The latter became the basis for the actual programming of MARVEL (Managing Resources for University Libraries).

DESIGN PROCEDURES

There is probably no single, correct way to design any system. For each recommendation in the literature there is at least one recommendation, which is its complete opposite. At UGAL the system design was approached on two broad fronts. A group of systems analysts and programmers from the OCA was responsible for reviewing hardware and software products and for determining the projected impact of a large interactive system on the University's existing computer operations. Al-

though the OCA had had previous experience with manipulating large bibliographic files through the information retrieval services offered by the Georgia Information Dissemination Center (GIDC), very little had been done in a truly interactive, on-line environment. The systems group was also responsible for developing any programs needed to support the design work. An applications group, consisting of library staff and a programmer from the OCA, was responsible for the design of all procedures involving the libraries. Personnel from IBM served as consultants to both groups and bridged the gap between them.

Generally speaking, systems can be designed to achieve maximum efficiency for the input, the output, or the processing of data. At Georgia, the applications group placed the highest priority on the output from the system. Input requirements came next and the actual processing of data last. If Baumol and Marcus have interpreted the cost trends for libraries correctly, it is paramount to make the man-machine interface as efficient as possible at the expense of computer processing. No attempt was made to flowchart the manual procedures in the libraries. Instead, system procedures were developed to take maximum advantage of the computer.

The restraints on the development of these procedures were twofold. First of all, the objectives of each library function had to be met. Secondly, any procedures developed had to be flexible enough to be easily modified. When an agreement had been reached on the functional objectives, and the basic system had been designed, the manual operations were reviewed. In many cases, the Technical Services Division found that many manual operations could immediately be improved by changing them to conform to the suggested machine procedures. In considerably fewer cases, the applications group was forced to modify the suggested machine design.

There was a general agreement that the entire system must be designed before any programming of individual functions could begin. There was less agreement about how to proceed with the programming itself. In the Initial System Design, it had been stressed that the system should be modular in order to speed up implementation. Unfortunately, the term modular meant different things to different people. The libraries wanted functional modularity, that is, each function, such as ordering, receiving, and circulation, should stand alone, but still be compatible with the others. Each function could then be programmed and implemented quickly and independently. There were sound, practical reasons for this viewpoint. As Veneziano and Aagaard point out in their discussion about Northwestern's library system, administrators take a dim view of projects spanning different fiscal years, unless some immediate payoff is visible.⁵ Also, it is difficult to convince library staff to take the long-term view. Frustrations and fear of the machine are sustained when no immediate results are forthcoming.

As opposed to the libraries' definition of modularity, the OCA wanted the system to be modular from a programming standpoint. File management, reading and displaying records, and updating procedures could be the same for all types of records and functions. The staff from the OCA stressed that to approach programming in this manner is cheaper in the long run and allows for implementation of the total system in the shortest overall time span.

In the final decision implementation was modular from a programming standpoint. Because the system was integrated and each part used the same bibliographic data base, it simply was not possible to write any programs for individual functions in isolation from the bibliographic system. Once that was finished, the programming of the individual functions followed so closely that the idea of functional implementation became more dependent upon the availability of terminals and other hardware, and on training of the staff, than on the programming itself.

DATA BASE DEFINITION

It was clear fairly early in the design stage that the key to success lay in designing a system based on a simple, logical data base. In this context the term "data base" has a very narrow definition. In order to define a collection of files as a data base, the data elements and the records must be grouped together in a logical way in related files, so as to avoid any uncontrolled duplication of data. Martin⁶ makes the additional distinction that a logical data base must be independent of individual programs and of physical storage requirements. A group of unrelated files does not constitute a data base in this definition.

The data base literature seems to agree on the following definitions. A data element is the smallest logical unit that has any meaning to the user. A coherent group of data elements forms a data record. For instance, a title would be a data element in a bibliographic record, and a patron's name could be a data element in a circulation record. Thus, a data record is simply a collection of data elements that have been defined to serve a particular purpose. Logically, a record can be shown as in figure 1. Such a schematic representation is called a schema.⁷ (The schemas shown here are abbreviated. In reality, each schema contains as many individual data elements as are required to achieve control over bibliographic data and other types of records.) The records in turn are grouped together in logical files. All the files together are referred to as the data base.

TITLE RECORD

TITLE #	TITLE	EDITION	AUTHOR	PUBLISHER	PUBLICATION DATE
---------	-------	---------	--------	-----------	------------------

Fig. 1. Example of Schema for Title Record.

To meet all the objectives stated in the "Initial System Design," a very complex data base had to be designed. It contains some forty-five logical files and some 300 data elements. The data base is controlled through a data element dictionary and a file dictionary. Each one of these occupies a separate file. The access to the data base is controlled through a staff file. Displays on the CRTs and printouts are controlled through easily updated tables maintained in separate files. Many of the programs are contained in individual files.

Although the requirements for particular data elements change from location to location, the basic principles in the data base design can be applied to any design of an integrated library system and are not confined to a particular implementation.

BIBLIOGRAPHIC SYSTEM

Set and Title Files

In traditional bibliographic files, such as the catalog, one record may describe different entities. The oldest and most common case is probably the standard monograph. Each card normally represents one volume, occasionally two or more, on a shelf in the library. On the other end of the spectrum is the card describing a periodical that is made up of numerous individual issues or volumes. The detailed information about holdings is kept separate from the catalog card, either in the same file or in separate files. The card describing a monograph in a series is a hybrid. It is similar to the card for the standard monograph, but it also defines the series to which the title belongs. By printing an extra card and filing it together with others that describe titles in the same series, it is possible to give the user access to the information about a library's holdings, even though he only knows the name of the series.

Most automated library systems keep monographs, periodicals, and series records apart, thereby failing to create an integrated data base. This is not necessary. To handle all parts of these three types of bibliographic records, while avoiding duplication of any data elements, only two logical files are needed. For lack of better terms, we call the first the SET file and the second the TITLE file. One set record can refer to more than one title record, but one title record only refers to one set. This generalized two-level structure can handle any of the cases mentioned above, as well as additional types of data.

A typical monographic series, its records, and its data elements are shown in the form of schemas in figure 2. The name of the series appears only once, namely in the set record. The individual titles appear in separate title records. The set record contains a list of the titles' numbers (the record keys to the titles), so that the title records can be located. Each title record contains the number of the set, so that the series name can be displayed and printed together with the title records.

For a periodical, the set record contains the title of the periodical and

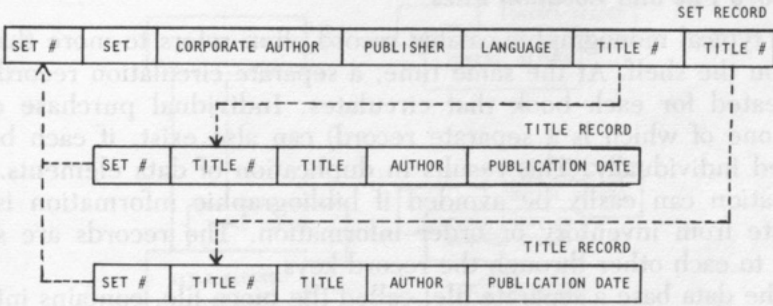


Fig. 2. Schemas for Set and Two Title Records.

all bibliographic data elements common to the periodical, while the title records contain data about issues or bound volumes. Normally, the latter will only contain a few data elements, such as volume information and the publication dates of individual issues. A typical periodical is shown schematically in figure 3.

For a serial, the set record contains typical bibliographic information about the serial, and each title record describes an individual volume. The title record may contain as much additional bibliographic data as required by local cataloging practices.

For monographs that are not in series each title record describes a title in the normal manner. No set record is required. On an experimental basis the set record is used at UGAL to describe the publisher. For large trade publishers, such a set has little practical value. However, for a small publisher, an association or a learned society, the information in the set record can be quite useful, especially for the processing division. The cost of maintaining the "publisher dummy sets," as we call them, is negligible.

Although not yet fully implemented, the two-level concept can be used to handle other types of records, such as in music, where the set record may describe an audio disc, and the title records can describe the individual bands on the disc.

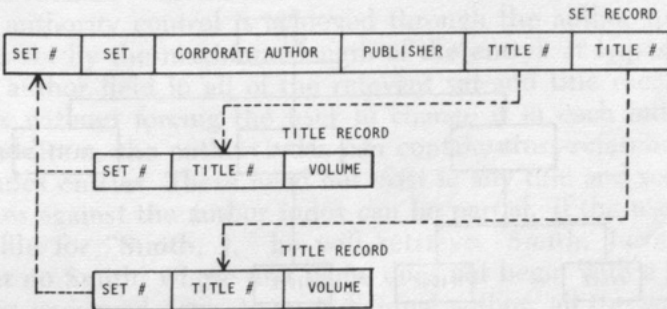


Fig. 3. Schemas for Periodical Title and Two Issues.

Inventory File and Location Files

The typical monographic catalog record often refers to more than one book on the shelf. At the same time, a separate circulation record must be created for each book that circulates. Individual purchase orders (each one of which is a separate record) can also exist, if each book is ordered individually. This results in duplication of data elements. Such duplication can easily be avoided if bibliographic information is kept separate from inventory or order information. The records are simply linked to each other through the record keys.

In the data base a separate file, called the piece file, contains information about each physical element that is acquired. Each item in the library corresponds to one record in this file. A piece record is always linked to a title record. A title record can, of course, refer to more than one piece record. Figure 4 shows how the data base handles information when there are two copies in the library for title number 1, one copy for title number 2, and none for title number 3. This clear distinction between bibliographic information and inventory information allows the system to keep bibliographic records in the data base, even though no book has actually been received.

To return again to the traditional catalog record, another problem is apparent. Many records describe particular characteristics of a book, which may not be true for other copies of the same title, or they may reflect local cataloging decisions. One of the objectives of the system was that it had to be location independent, while at the same time allowing local data to be entered. To fulfill this requirement location-dependent information is kept separate from bibliographic information in files called location control files. There is one such file for sets and one for titles. Each location control record for a set is always linked to one set record. A set record, on the other hand, can refer to many set location records. The same principles apply to the relationship between the location control records for titles and the title records. Figure 5 illustrates the relationships between the five bibliographic files.

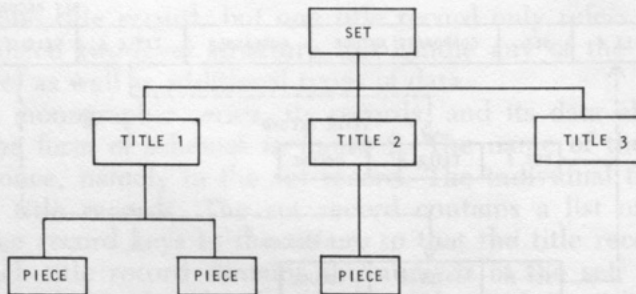


Fig. 4. Set, Title, and Piece Records.

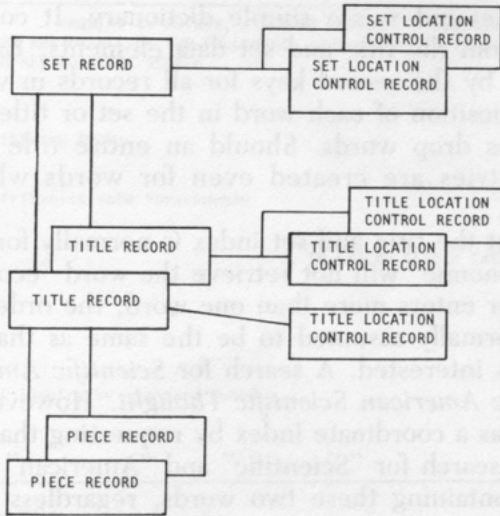


Fig. 5. Bibliographic Files.

Index Files

One objective of the project was that the user should be able to communicate with the system in a simple, nontechnical manner. This meant that the use of search keys was impractical. Instead, the indexes were designed to let the user search much in the same manner as he would search the card catalog by full or partial names of authors and fully spelled-out words for titles or sets. Eleven bibliographic index files were designed, including an author index, a title and set index, and nine numeric indexes. (In addition, it is possible to search by local control numbers, called the set, title and accession numbers.)

The author index contains the entire name of personal or corporate authors as they are entered on the data base, but converted to upper case letters, up to a current maximum of fifty characters. The original intention was not to have any limit on the length in the index, but the file access method—VSAM—dictated that some limit be set.

Name authority control is achieved through the author index (within the limits set by the maximum length of the entry). It is possible to update the author field in all of the relevant set and title records through the index without forcing the user to change it in each individual record. In addition, the author index can contain cross-references to other author index entries. These need not exist in any title and set record.

Searches against the author index can be partial. If the user is searching the file for "Smith, J," he will retrieve "Smith, Jacob," "Smith, John" but no Smith, whose first name does not begin with a J. Once the search has narrowed down to an individual author, all the works by that author are displayed.

The title and set index is a simple dictionary. It contains only one word at a time from the title and set data elements. Each word in the index is followed by the record keys for all records in which it appears and the relative position of each word in the set or title. Certain words can be defined as drop words. Should an entire title consist of drop words, index entries are created even for words which would not normally be used.

A search against the title and set index is normally for specific words. A search for "economic" will not retrieve the word "economics," for instance. If the user enters more than one word, the order in which they are entered is normally assumed to be the same as that of the title in which the user is interested. A search for *Scientific American* will normally not retrieve *American Scientific Thought*. However, it is possible to use the index as a coordinate index by requesting that word order be ignored. Then a search for "Scientific" and "American" will retrieve all sets and titles containing these two words, regardless of the order in which they appear.

The design of the author and set/title indexes gives the user an extremely powerful tool for locating information. It is possible to combine searches for authors, titles, and sets. If such a combined search is only partially successful, the user is told how many author entries were found and how many titles and sets were found.

Searches against the numeric indexes are less powerful than against the author or set/title indexes. In principle, no duplicate numbers exist on the bibliographic files. Therefore, the numeric index only contains the number from the relevant data element and one record key. A numeric search can only be made against one numeric index at a time, and only specific searches are allowed. Partial searches are currently not possible, although it may be useful to allow them, for instance, against the class number portion of the call number.

Practical Example

A practical example illustrates how the user communicates with the system and how the bibliographic data are displayed. Figure 6 shows the basic input screen for searches for authors, titles, and sets. A search for *Afrikanistische Forschungen* results in the display in figure 7, giving the user basic bibliographic information about the series. The information from the location control file for the set is automatically displayed based on the location of the terminal. In figure 7 the user learns that the series is located on the third floor of the main library on campus, and that only partial holdings are available.

By entering the letter *T* (for title) at the bottom of the screen in figure 7, the user requests that any titles belonging to the series be displayed. Brief title information is displayed as shown in figure 8. Each title that has been received is so shown. Full information for an indi-

```

INQUIRY          INQUIRY BY AUTHOR, TITLE OR SERIES      78/01/15  LT13
PLEASE ENTER ANY OR ALL OF THE FOLLOWING.  PRESS TAB KEY TO MOVE CURSOR.
PRESS ENTER KEY TO START SEARCH.
TITLE:

AUTHOR OR ISSUING BODY:

SERIES:  Afrikanistische Forschungen

                                           TO EXTEND SEARCH ENTER YES:

OPTIONS:  I-inquiry by standard number;
RESPONSE--:

```

Fig. 6. Input Screen for Bibliographic Searches.

vidual title can then be selected and displayed, as in figure 9. The user can continue the search downwards by requesting that the circulation status of the particular title be shown.

As all links between different records are two-way links, the user could just as easily have started his search by finding a title, and from the title display, have proceeded to the set record.

ACQUISITIONS AND CIRCULATION SYSTEMS

The division of the bibliographic information into purely bibliographic records, location dependent records, and an inventory record is applicable to any fully integrated library system. The design of the index files

```

INQUIRY          TITLE INFORMATION          78/01/15  LT13
SET#> 0000-015-686  TTL#> 0002-9110-62  SET> Afrikanistische
Forschungen
VOL#> Bd.3      TTL> Die Ron-Sprachen; tschadohamitische Studien in Nord
nigerien  LANGUAGE001> German
AUT> Jungraithmayr, Herrmann.
PUBL001> J.J. Augustin, Gluckstadt, Hamburg  DATEPUB> 1970
CALL#> PL8607.R61J8
LIBRARY:LITERATURE (3RD MAIN)
STATUS:RECEIVED

OPTIONS:  K-copies:S-Set; H-other libs; L-locn cntrl; X-refer;
I-new inquiry;
RESPONSE:  _

```

Fig. 7. Screen Showing the Record for a Monographic Series.

INQUIRY	TITLES WITHIN SET	78/01/15	LT13
SET> Afrikanistische Forschungen			
LIBRARY> LITERATURE (3RD MAIN)		STATUS> PARTIAL	
1. 1973	Bd.7	Der Prosoponnetikos 'uber den rechten Glauben'	
des Kyrillos von Alexandrien an Theodosius II (hrsg.v.) Bernd Manuel Weischer.			
		Cyrillus, St., pat. of Alexandria.	
2. 1972	Bd.6	Grammatik der sudlichen Beraberndialekte,	
Sudmarokko.	Willms, Alfred.	RECEIVED	
3. 1971	Bd.5	Die Sprache der Mamvu.	Vorbichler, Anton
RECEIVED			
4. 1970	Bd.4	Studien zur Sprache der Gisiga (Nordkamerum)	
Lukas, Johannes			
5. 1970	Bd.3	Die Ron-Sprachen; tscadohamitische Studien in	
Nordnigerien.	Jungraitmayr, Herrmann.	RECEIVED	
OPTIONS: LINE#-display title; H-other libraries; L-locn cntrl			
RESPONSE:			

Fig. 8. Screen Showing Brief Records for Titles in a Monographic Series.

depends on local requirements for access to data, as well as on availability of on-line storage. The logical data record and file definitions for the acquisitions and circulation functions are only partially dependent on the particular location. Few networks and other cooperative ventures have succeeded in offering such services to their members. Normally, failures have been attributed to a system's inability to handle all of the different local requirements for data. These do not necessarily dictate the logical file structure but must be able to affect the existence of particular data elements. A properly defined data base, which should be independent of individual application programs, should solve that part of the problem. Whether it can also solve the political problems, or the "not-invented-here" syndrome, as Brong and Pasternak call it, is an open question.⁸

In principle, only four additional logical files are needed for an acquisitions system, an order file, a vendor file, a fund file, and an accounts payable file.

In a manual system the order record is independent of other bibliographic records. The purchase request may have been checked against the card catalog and searched against standard bibliographic sources before becoming an order, but the order itself is an individual record. Often different files are maintained for different types of orders. For instance, subscriptions are often separated from standing orders, which are separated from unit orders. Such separation is not necessary. Bibliographic data can be entered in the set or title files at once. The order record then can be linked to the set record for subscriptions and standing orders and to the title record for unit orders through the location control files. The information to be printed on the actual order and the information to be displayed on the screen for the library staff is created

INQUIRY	SET INFORMATION	78/01/15	LT13
SET# > 000-015-686	SET > Afrikanistische Forschungen		
LANGUAGE001 > German			
PUBLO01 > J.J. Augustin, Gluckstadt, Hamburg			
CALL# > PL8607.R61J8			
SEALS0001 > Cyrillus, Saint, patriarch of Alexandria. Qerellos. (Sub series)			
RELSET#001 > 0000-578-140			
LIBRARY:LITERATURE (3RD MAIN)			
STATUS:PARTIAL			
OPTIONS: T/YEAR-titles (/year opt); H-other libs; S-related sets; X-refer; L-loan cntrl; RESPONSE: -			

Fig. 9. Screen Showing the Record for an Individual Title in a Monographic Series.

by combining elements from the different files. To account for subscriptions and standing orders, a separate data element in the order record can be defined for statistical purposes.

The order file should not contain the vendor's name or address, but only a link to the vendor record through the vendor number. The vendor record in turn is linked to the open orders through the order numbers. To help the user find a vendor record, a separate vendor index is needed consisting of the name of the vendor and the vendor's number.

To control book and serials expenditures, each order is charged to an internal fund within the libraries' budget. These internal funds are maintained in a separate file. The funds at UGAL are hierarchical, so that each bibliographer can define his or her acquisitions within very narrow subject areas, while at the same time totals are available for larger groupings. The fund file controls both encumbrances and actual payments.

When books are received, an invoice record can be created in an on-line accounts payable file. Each line item on the invoice is automatically linked to the order record from which the fund and the vendor are available to the system. The information is retained on the invoice file until all items have been received, and the invoice has been properly balanced. Payment information is also added to the order file where it remains until the order record is deleted.

The schemas showing the relationship between individual records are shown in figure 10. Although these schemas show a limited number of data elements in each data record, the basic logic behind linking them together in this manner is perfectly generalized. Each unit in the system can then define its own data elements within this framework.

The clear distinction between the title file and the piece file allows

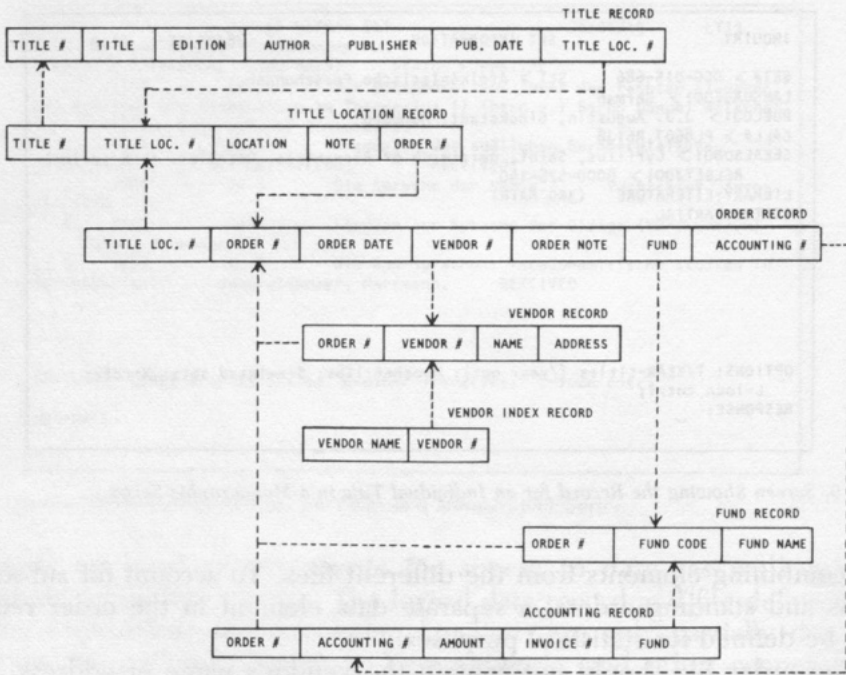


Fig. 10. Schemas for Acquisitions Files.

circulation to control where each individual item is in the library without ever having to affect the bibliographic information. One additional file must be defined for the circulation function. It is the patron file. To record that an item is circulating, the system simply creates a link between the relevant piece record and the patron record. When the book is returned, this link is deleted from both files.

Obviously, one book can only be borrowed by one patron at a time. A patron can, of course, borrow more than one book. Consequently, a piece record can only be linked to one patron record, but a patron record can be linked to many piece records.

Two other separate files exist to control circulation activities. Like all other records, patron records are sorted in numeric order. To enable staff to retrieve information about a patron whose name is known, a separate patron index is needed. Fines, charges for lost books, and other accounting information for the patron can be kept in a patron accounting file.

The complete file structure combining the bibliographic files with the acquisitions and circulation files is shown in figure 11.

FUNCTIONAL IMPLEMENTATION

In order to access the data base and conduct normal library operations, twelve major system functions were defined. Each function in

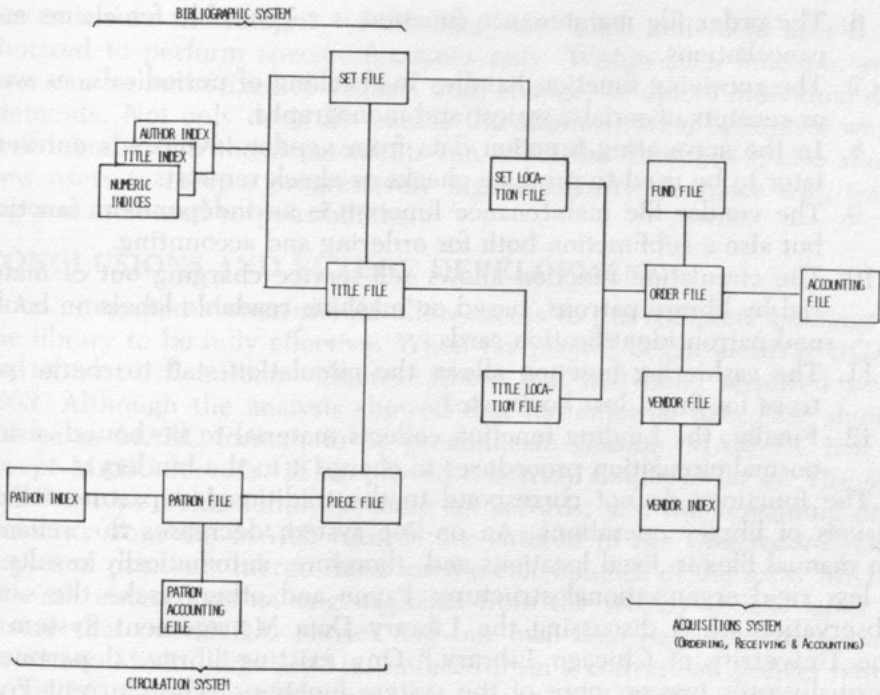


Fig. 11. Complete File Structure.

turn is divided into sub-functions. Some of the major functions also serve as sub-functions within other major functions. The operations can most easily be described in the order of the flow of a typical record through the system:

1. The inquiry function allows both staff and patrons to make inquiries about the status of all material. If the user does not find a title or set, he or she can convert the inquiry to a request for new material.
2. The request is automatically routed first to the data edit function, and then to the
3. Set control function. These two are responsible for the verification and search procedures, for the authority control and the general integrity of the data base. The data edit function is decentralized and the set control function centralized. This allows all records to be updated at the location where they are used but checked at one central location before they are entered on the data base.
4. In the selection function, subject bibliographers authorize acquisitions against particular funds.
5. The ordering function makes the vendor selection, defines claim periods, prints, and mails the orders.

6. The order file maintenance function is responsible for claims and cancellations.
7. The receiving function handles in-checking of periodicals, as well as receipts of serials, series, and monographs.
8. In the accounting function data from vendor invoices is entered, later to be used to produce checks or check requests.
9. The vendor file maintenance function is an independent function but also a subfunction both for ordering and accounting.
10. The circulation function allows self-service charging out of material by library patrons, based on machine-readable labels on books and patron identification cards.
11. The cashiering function allows the circulation staff to charge patrons for fines, lost books etc.
12. Finally, the binding function collects material to be bound, using normal circulation procedures to charge it to the bindery.

The functions do not correspond to the traditional departmental divisions of library operations. An on-line system decreases the reliance on manual files in fixed locations and, therefore, automatically results in a less rigid organizational structure. Payne and others make the same observation when discussing the Library Data Management System at the University of Chicago Library.⁹ One existing library department normally uses two or more of the system functions. The Current Periodicals Department at the University of Georgia Libraries, for instance, is responsible for placing subscriptions with particular vendors, approving vendors' invoices for payment, checking in current issues, and claiming non-receipts. This requires using the four system functions: ordering, order file maintenance, receiving, and accounting. At the same time the receiving function is also used by other departments to receive monographs and serials.

Some tasks involve more than one individual. The information about such tasks is controlled through a file called the referral file. A referral is a message sent from one function to another, or from one person to another by means of the on-line system. Some of these are created and deleted automatically. For example, when an order is placed, a referral is sent to the order file maintenance function, so that a claim can be sent if the material does not arrive on time. When the order is filled, the referral record is automatically deleted. Other referrals are created by a user in the normal course of finishing work on a record, or in order to draw someone's attention to a problem. Three types of referrals exist. A message can be sent from one function to another, for instance, from ordering to accounting. A message can be sent within one function, for instance, within circulation from a staff member to his or her supervisor. A message can be sent to oneself. This is necessary in order to allow staff to postpone making decisions without having to keep manual files and without having to alter the records on the data base.

Needless to say, a very stringent security system is an absolute neces-

sity to assure the integrity of the data base. Each individual user is authorized to perform specific functions only. Within each function, each user can be authorized to display, add, change, or delete individual data elements. Not only does this enable the administration to control which staff members in the departments can affect the files, but it also allows new users to receive progressively higher security clearance with training and increased responsibilities.

CONCLUSIONS AND FUTURE DEVELOPMENT

An integrated system should allow access to the complete holdings of the library to be fully effective. When the project began in 1974, UGAL had almost 1.5 million volumes. About half had been acquired since 1968. Although the analysis showed that our internal data base should not be in MARC format, to be economically feasible MARVEL had to accept MARC records. It has proved relatively simple to do so. The 400 and 800 type fields simply become set records, and the remaining data elements from the MARC records are entered in the title record. Displays and printouts merge these for the convenience of the user. MARC data are entered on an ongoing basis from the weekly OCLC tapes to ensure that our OCLC entries and our own data base records remain the same. MARC data are also entered from a conversion project based on OCLC tapes received since our joining SOLINET in 1975 and on the MARC tapes received on the LC MARC subscription. The only requirement imposed by MARVEL is the need for a much more rigorous authority control over series and serials.

The differences between the MARC format and the UGAL internal processing format have been reconciled in the sense that MARVEL is able to accept MARC records on a regular basis. The current implementation of the system, however, will not be able to return a full MARC record without recourse to the original tape data, because of two decisions made by the libraries' administration. The question really is why should any local system built around OCLC be able to do so? UGAL has no intention of discontinuing the use of the OCLC system. The larger its data base grows, the more useful it becomes, even though UGAL may eventually close the card catalog and discontinue filing cards. Not only is the information in the OCLC data base superior to what could be produced locally, it also allows us to add our holdings to what is rapidly becoming a national data base.

The two decisions that affect our ability to return a full MARC record were to exclude both subjects and diacritics from the data base.

The exclusion of the subject headings was intended to be temporary. The UGAL administration always felt that the subject approach should be a separate phase of the MARVEL project. Obviously, the lack of a subject approach would remain a problem if the card catalog is going to be closed. The programs written for the word index (the set and title index) can quite easily be adapted to search against the LC or any other

subject classification. They would, however, probably result in a lack of subject authority control. The programs for the name authorities and the author index would offer an authority feature but could make the search capabilities slightly less flexible. The final result may be a combination of the best features of both.

The lack of diacritics is not seen as a problem. As Veaner states in discussing *BALLOTS*, there is no indication that a lack of diacritics affects the ability of the user to retrieve data from an on-line file.¹⁰ On the contrary, the lack of diacritics makes the data base accessible by almost any type of terminal, an important consideration if access to the data base is eventually to be permitted campus-wide.

We have clearly not solved all of our problems, but we feel that we are prepared to face both the change to AACR 2 and the Library of Congress' decision to close its catalog. We have at least begun addressing the authority control problems and the problems with different bibliographic levels. We have centralized the control of the integrity of the data base, an important aspect, as no machine system (at least today) can be expected to make the qualitative decisions required to define levels and content of bibliographic data.

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Suggestions for Library Network Design

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It has become clear over the last few years that the design of automated library methods will be based in the future on cooperative arrangements between library centers and on various library network organizations. Various approaches to the design of automatic library systems are described and an attempt is made to assess the importance and effect of library network systems on library operations and library effectiveness. Suggestions are also made for the design of rational and effective automated library processes. In particular, it is shown that ordinary library housekeeping operations can be conducted cooperatively while preserving intact the intellectual interests of individual library organizations.

LIBRARY MECHANIZATION

Over the last ten to twenty years, several different approaches have been taken in attempting to utilize mechanized procedures for library operations. The first possibility, termed *piecemeal mechanization*, would consider the various library processes separately, and introduce mechanized operations piece by piece—for example, a circulation system in one organization, or a book-ordering system in another. Since each library would normally proceed on its own, substantially similar library processes would be mechanized with slight variations in many different places without necessarily introducing major changes in the established processing strategies.

The next possibility consists in creating *integrated library systems* where both the business and the intellectual library operations are considered together, and an attempt is made to construct a complete library management system including accounts receivable and payable operations as well as book ordering, acquisitions, cataloging, and circulation procedures. The BALLOTS system at Stanford, the management system at the University of Chicago, and the Dobis system at Dortmund (Germany) are examples of this approach.

A third possibility consists in postulating a completely new library design where the shelf arrangement of books and journals would be re-

placed by a computerized store containing presumably the full text of all library items together with appropriate search methodologies making it possible by automatic methods to access and copy required materials on demand. For a variety of reasons such a *library of the future* has never been designed in detail, and there are reasons to believe that its implementation may have to be postponed for some additional time.

None of the three approaches to library mechanization mentioned up to now can be said to have been truly successful. The piecemeal mechanization approach followed earlier in many places has largely been abandoned, not because the approach is inherently impossible, but rather because the investment required by individual libraries is very large while the returns are often uncertain. In fact, the data processing requirements controlling most library operations are sufficiently complex to rule out a "quick and dirty" approach to library mechanization: the file sizes to be processed in many libraries are now very large, consisting in some cases of many millions of items; many different processes must be carried out in the library, involving in some cases hundreds of different inputs used to generate an equal number of different output results; the library environment is not closed, but evolves dynamically in the sense that new items enter the system at all times while old items may be discarded, and library patrons and personnel continuously effect system changes; finally, in a library environment real-time control should be maintained over library items in that the location and status of each library item should be ascertainable at any given time.

It is unfortunately obvious to experts in data processing that an application requiring the manipulation of many different, very large files in a dynamic environment under real-time control poses substantial problems of efficiency and effectiveness. In fact, it has been found in many organizations that the resources needed were very large and that the cost to individual libraries exceeded by far the returns obtained in the form of improved methodologies and control, and more effective processing. Some observers of the library scene have claimed in this connection that the introduction of computers into the library is counter-productive since many needed resources are then drained away from other areas, such as book acquisitions, where they might furnish more important benefits:

my observations convinced me that the computer is *not* for library use; that all the promises made in its name are completely fraudulent; that its use weakens the library as a whole by drawing off large sums of money for a small return, and that it should be stamped out.¹

Be that as it may, by the middle nineteen-seventies, the piecemeal approach carried out separately for each individual library had largely been abandoned.

The "total library systems" approach is possibly more rational because

individual library operations are difficult to separate from each other, and library systems should be considered in a global way. However, in practice there have been difficulties, often connected with the efficiency of the operations in terms of cost or time expended, and sometimes also with the effectiveness of the automatic system. The feeling at this time is that these total systems are not (or not yet) sufficiently cost effective for implementation in individual libraries:

experience seems to indicate that these systems are too costly to operate in a single library environment, and most libraries have moved beyond the idea of having their own dedicated system.²

Concerning finally the design of the library of the future, it should be said that since the ideas of the future library were first conceived about fifteen years ago, substantial progress has been made in the area of on-line access to stored library collections.^{3,4} In fact, in most operational retrieval environments the stored information files are routinely interrogated using console access equipment, and interactive conversational systems are made available to users for the purpose of refining the search formulations to the point where useful responses may actually be obtained in answer to retrieval requests. On the other hand, the more far-reaching proposals directed at the elimination of hard-copy books and documents and their replacement by a huge store of machine-readable texts have certainly not received serious consideration in practice. Nor are we any closer than we were fifteen years ago to the time when it would become possible "to find in ten minutes everything relevant about a topic."⁵ Indeed, for the foreseeable future, it seems reasonable to count on the continued existence of physical libraries, and to concentrate one's attention on the handling of mechanized files of document surrogates rather than actual documents themselves.

From what has been said so far, it would appear that an impasse has been reached, since on the one hand, piecemeal mechanization and total library systems are not in the cards for individual library organizations, while on the other hand the prospects of the ultimate library are still somewhat remote. Fortunately, a number of recent hardware developments and advances in software practice have created an environment where new possibilities become apparent for the mechanization of library processes:

- quite a few computer applications are now implemented successfully involving the manipulation of very large files of millions of records;
- viable systems exist for on-line interaction between users and system, using feedback information supplied by the operators to control the automatic processing;
- small processors are becoming available whose capabilities exceed those of many older, larger machines at appreciably lower cost;

- front-end attachments can be obtained in the form of intelligent terminals to facilitate the interactions between users and automatic system;

- back-end processing devices directly attached to the computer memory are used to speed up the retrieval operations by rendering possible parallel searches of the computer store;

- finally, networks of computers can be implemented by connecting processors situated in several different geographic locations, and computations can be carried out cooperatively by allocating individual subtasks to several different machines.

It is clear that all of these facilities are potentially helpful in implementing cooperative network arrangements between library centers. This possibility is examined in the next section.

COOPERATIVE LIBRARY NETWORKS

The idea of library cooperation and joint working arrangements between different libraries is not new. Indeed interlibrary loan arrangements have been carried out in a routine way for many decades. In recent years the formation of library networks, compacts, and consortia has however taken on a new urgency as individual libraries have become less and less self-sufficient. Two considerations are of primary importance in this connection. First there is a feeling in many library circles that the resources needed to acquire all the wanted bibliographic items are no longer available; hence, the collections locally accessible to library patrons are often inadequate to meet the demand. Second, many libraries are overwhelmed by the technical processing requirements which arise in ordering, acquiring, cataloging, and circulating the library items.

These conditions lead directly to various kinds of cooperative activities based in general on some form of machine-readable union catalog to be consulted for technical processing and bibliographic search purposes. Such a catalog may provide access to potentially large document sets consisting of the union of the collections of the participating libraries. One or more of the following advantages of library cooperation are immediately obvious:

- access may be provided to shared collections through more liberal interlibrary loan methods, and broadened borrowing privileges may be made available to large user groups by pooling several different library collections that may be located in dispersed geographical areas;

- the collection development of cooperating libraries may be coordinated to avoid duplication of rarely used materials;

- the shared access to bibliographic data may also support the technical service processing by utilizing a joint union catalog for acquisitions and cataloging purposes;

- a mechanized catalog might support more sophisticated subject ac-

cess tools than those normally provided by manual card catalogs, and could therefore lead to enhanced service standards for the user population;

- by shifting some of the responsibility for collection development and technical processing to other participants among the cooperating library groups, substantial savings could accrue to individual libraries, thus providing relief from the continuous library budget spiral.

Several cooperative library network organizations have been successful in providing some of the foregoing advantages to participating groups. The most notable may be OCLC where a machine readable union catalog is made accessible to hundreds of different remote points. Participating libraries supply the input cataloging for new items not already included in the catalog, and the central system provides the necessary programs for acquisitions processing and catalog card production.^{6,7}

In theory, then, a rational solution may be in view for some of the most persistent library problems: the work load is shared by a number of different organizations which decide to cooperate in technical processing and collection development, and a joint mechanized catalog is used to control the operations for the complete library group.

In practice, the situation is complicated not only because library compacts operate in many different circumstances with varied objectives and different forms of governance and funding, but also because the existence of library networks raises questions of a technical, legal, and social nature involving the document processing and dissemination fields.⁸⁻¹⁰

The first problem is created by the contention that library cooperation is impossible in the absence of agreed-upon *standards of bibliographic description* and bibliographic processing. In particular, it is believed that joint catalog construction and access methods by different library organizations cannot be implemented if the bibliographic data are not treated consistently by all participants, and if authority files are unavailable for the specification of appropriate cataloging rules and interpretations:

without standardization, we get only limited cooperation between libraries, and only limited catalog access.¹¹

At the same time, the chances of generating agreed-upon standards that are widely followed are remote in view of the heterogeneous nature of the library groups, and the different aims of individual participants.¹²

The standardization problem appears overwhelming largely because of problems inherent in the use of manual card catalogs. In such circumstances the number of access keys available for the identification of a given library item (that is, the number of identifiers included in a catalog card which lead to a given document) is very small, and the ac-

curacy and consistency of the cataloging data are of some importance. In particular, a standard method for describing author names and organizations is helpful in a conventional environment in providing access to the library items. In the case of an automated library catalog, the number of access points and catalog identifiers may be very large indeed, and consistency and accuracy in the identification of each particular specific key is no longer crucial. Hence the standardization question may not present the serious impediments to the institution of library networks that are now anticipated.¹³

A second problem arises because of differing interpretations by the various library group participants of their aims and responsibilities. Many libraries already operate established services, and local administrations that finance and/or manage a given service may be expected to insist on the maintenance of current procedures and current user privileges. Thus, there may be substantial reluctance in allowing the files to be "cluttered" with questionable data that are not of immediate interest in a local environment, and the interests of sister organizations within a given library grouping may not appear sufficiently compelling when the time comes to make decisions about document acquisition or circulation rules.

This problem takes on special importance in the area of *collection management*. Indeed since all collections are necessarily limited in scope, decisions must be made about what to include in, or to exclude from, the files which are searched in response to incoming information requests. In the literature, voluminous studies are published about document growth and obsolescence, and recommendations have been made for document retirement, based for example on the date of publication of an item, or on the most recent publication date (the idea being that items that have not circulated for a long time are unlikely to circulate in the near future, and may hence be relegated to lower level files). The concept of a multilevel file system is well-known in information science, where a relatively small central file is searchable rapidly and inexpensively, and successive layers of larger peripheral files contain items that may be needed less frequently and are available at greater cost with a longer time delay.¹⁴⁻¹⁶

It appears evident that in a network environment different criteria of growth and retirement may pertain to different organizations. Hence a particular circulation statistic accumulated in one environment may not adequately represent the interests of the combined user populations. Some rules must then be established for network collection management, and consideration must be given both to the treatment of actual documents as they appear on the library shelves, and to the maintenance of the mechanized catalog.

A problem somewhat related to the previous one concerns the *financial arrangements* which control network generation and maintenance.

It is clear that a library network is expensive to create and to operate, and that the benefits and use of the network system are likely to be unequal. In particular, the information flow might largely run in one direction (from the strong components which control important library resources to the weaker ones which need to obtain access to these resources). Complicated financial rules may then be needed to insure that all participants are fairly treated, and that the original investment in the library system is somewhat related to the benefits that might be derived from the cooperative arrangement.

A number of long-range effects of library network operations must also be considered. Special provisions may very likely be needed to maintain the *privacy* of some of the stored records. The privacy problem is complicated in a mechanized network situation, first because the records are accessed using computerized software or hardware tools that may be subject to special abuses, and second because a large and heterogeneous user population may potentially obtain access to a given data item. Rules must no doubt be devised to decide on the access prerogatives of various user groups, and provisions must be made to insure that the rules are obeyed.

An equally distressing situation arises in a network environment by potential effects on the *document publishing and dissemination industry*. The monograph and journal publishing business could in fact be subjected to novel pressures of several types. First, it is clear that a principal aim of network construction is the institution of liberal borrowing and interlibrary loan arrangements between participating library components. Second, photocopying technology may be used conveniently to disseminate materials to users both on an in-house basis and via long-distance transmission. The publishing industry claims that both developments are pernicious since liberal copying policies and easy interlibrary loan arrangements will necessarily compete with sales of library items.¹⁷

The alleged survival problem for the publishers of scholarly materials is rendered more serious by questions concerning the general viability of the currently practiced publication process for scholarly journals. Indeed, since few if any of the papers published in a typical journal are read by more than a small fraction of the readers, the suggestion has been made that the publication of complete journals be replaced by a dissemination of individual articles whose characteristics match the interests of specific recipients.¹⁸ In a library network situation such a selective article distribution system can be implemented easily, and once again a loss of revenue (through decreased sales and advertising revenue) may result for the publishing industry.

Many of these questions have surfaced with increasing insistence during the last few years, as demonstrated by the hearings recently held by the U.S. Congress in preparation for the promulgation of revised

copyright protection laws. During these hearings, the publishers contended that library photocopying and cooperative library arrangements are used to replace journal subscriptions and book sales. The library interests responded by saying that photocopying is performed as a service to many library patrons who do not have normal access to library materials. Furthermore, the librarians maintain that a wide circulation of reading matter is the best possible guarantee of further sales.¹⁹

At the present time, the full effects of future library network operations remain uncertain. It may be that the current fears of some of the participants in the document processing chain are unfounded. However, enough misgivings about undesirable secondary effects have been voiced to indicate that the situation must be carefully watched.²⁰

In the remainder of this study certain technical problems arising in library network environments are examined, and suggestions are made for a viable implementation of library housekeeping as well as of the intellectual collection management operations.

AUTOMATIC LIBRARY PROCESSING

The various examples of existing, successful operational implementations of cooperative library processing systems demonstrate that the basic library housekeeping operations are conveniently performed in a standardized manner by groups of cooperating libraries. Furthermore, the construction of a mechanized, cooperatively maintained union catalog is helpful for pre-order and cataloging purposes. On the other hand, it is not evident that each individual library component should necessarily be forced to give up its particular aims and directions when a cooperating library group is being formed. Ideally then the more routine business-type operations should be standardized as far as possible whereas the intellectual operations (such as content analysis, collection arrangement, document growth and retirement, etc.) might be tailored primarily to local requirements and local users.

It turns out that in this instance it is possible to fulfill all of these requirements because a combined mechanized operation can easily support several different intellectual systems. Furthermore, with a mechanized catalog, it is unnecessary to preserve the "exact match" standard which is current with conventional library catalogs. In particular, in conventional manual systems a standard card catalog is accessed using only a few well-specified entry points, consisting generally of the author names, and of particular library classification identifications. When an exact match does not obtain between a given author specification (or a particular classification number) submitted by a searcher and the corresponding entry in the library catalog, the library item in question will not be selected.

In a mechanized environment, it is convenient to use for document identification purposes a large number of different identifiers. Thus, one

can use different kinds of author names (including several different pseudonyms), classification numbers, title words, subject identifiers, notations of content and other indicators. Many automatic indexing systems which utilize document abstracts for analysis purposes routinely assign between fifty and one hundred content identifiers to individual documents.^{21,22} In these circumstances, a document is then represented by a long list of identifiers, sometimes called a *term vector* of the form

$$D = (d_1, d_2, \dots, d_t) \quad (1)$$

where d_k represents the weight, or value of the k th identifier. In many systems, binary vectors are used, that is, the values of the terms or identifiers are restricted to 0 or 1 depending on whether a given identifier is absent from, or present in, the vector. A vector of the form $D = (0, 1, 0, 1, 0)$ then indicates that terms 2 and 4 are present in the vector whereas terms 1, 3, and 5 are absent.

When documents are identified by term vectors, it is possible to perform a *composite*, or *global match* between the corresponding vectors to produce a coefficient of similarity between these vectors as a function of the number and the weight of the matching terms. Thus given two documents D_i and D_j (or alternatively a query Q_i and a document D_j) represented respectively by the vectors

$$D_i = (d_{i1}, d_{i2}, \dots, d_{it})$$

and

$$D_j = (d_{j1}, d_{j2}, \dots, d_{jt}),$$

two possible measures of similarity are

$$g(D_i, D_j) = \sum_{k=1}^t d_{ik} d_{jk} \quad (2)$$

and

$$h(D_i, D_j) = \frac{\sum_{k=1}^t d_{ik} d_{jk}}{\sum_{k=1}^t (d_{ik})^2 + \sum_{k=1}^t (d_{jk})^2 - \sum_{k=1}^t d_{ik} d_{jk}} \quad (3)$$

The formula of equation (2) measures simply the number of matching identifiers when the original vectors exhibit binary weights. Formula (3) produces a similarity measure between 0 and 1, the latter value obtaining when all terms match perfectly.

When a global match is used in a library environment it becomes possible to retrieve a library item (by generating a high value of the coefficient h or g) even when query and document vectors differ in certain respects. Thus, if a given catalog search is carried out using content identifiers and/or title words, but not including, for example, the author names which may be unknown to the searcher, the correct document or documents may nevertheless be retrievable if a sufficient number of the other identifiers can be found to match. In practice, there is no reason why a particular union catalog containing subject identifiers and cataloging data from many different sources should not be searchable by each participating organization using somewhat different query formulations. Appropriately high matching values will be obtained whenever a sufficient number of terms are found to match.

In an interactive environment where queries are submitted using computer consoles for input and output, it is also possible to arrange the system responses in decreasing order of the matching coefficients between queries and documents. The searcher can then determine which of the displayed, highly matching items would constitute appropriate responses to the queries.

When the similarity computation of equation (2) or (3) is used to generate similarity between pairs of documents, rather than between queries and documents, groups or *clusters* of documents exhibiting high matching coefficients with each other can be generated automatically.^{23,24} This produces an automatic classification system in which items with similar subject descriptions (authors, titles, content identifiers, and so on) are placed into common document classes. Each class generated by such a process can again be represented by a vector of terms, called the *class* or *classification vector*, defined as a composite of the individual document vectors in that class. For example, the value of the i th term in the class vector C_j for a class j comprising n documents—that is the value of c_{ji} in vector $C_j = (c_{j1}c_{j2} \dots c_{jn})$ —might be defined as the average value of the i th terms for all document vectors in the class, or

$$c_{ji} = \frac{1}{n} \sum_{k=1}^n d_{ki} \quad (4)$$

A typical clustered file organization is shown in fig. 1, where the distance between two given vectors is assumed to be inversely related to the corresponding similarity coefficients. Thus when two x 's are close together in the plane of fig. 1, the corresponding documents have many common identifiers; the contrary obtains when two x 's are far apart.

A clustered file organization is conveniently used for search purposes as well as for collection control. In particular, given a query $Q =$

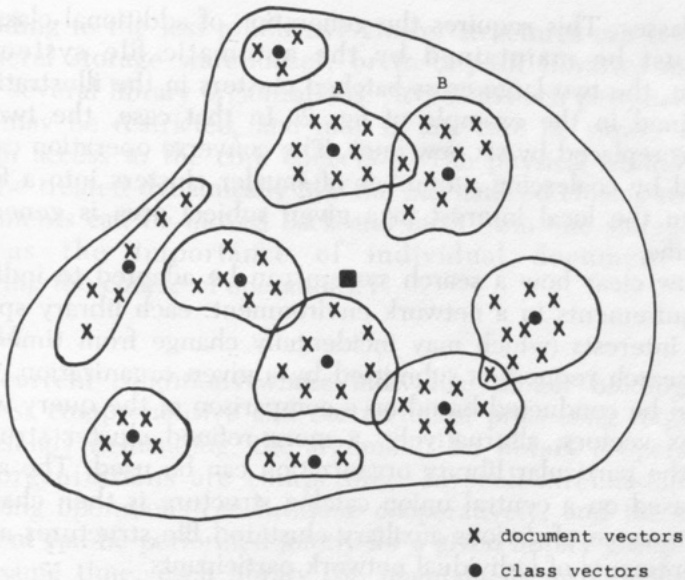


Fig. 1. Clustered File Organization.

(q_1, q_2, \dots, q_t) , it is possible first to identify all classes whose class vectors exhibit certain similarities with the query. This may be done by computing the similarity coefficients $g(Q, C_i)$ or $h(Q, C_i)$ for all possible class vectors. For all class vectors exhibiting a sufficiently high similarity with the query, the individual documents in the corresponding classes are subsequently compared individually with the query as explained previously.

Such an organization leads to rapid file searches because large sections of the file, corresponding to all classes whose class vectors are not sufficiently similar to a given query, can be immediately rejected without touching the corresponding document vectors. Furthermore the clustered storage organization lends itself to effective interactive search strategies, because documents previously retrieved in response to initial query formulations can be used to obtain additional useful items, consisting of related documents located in the same clusters as those originally retrieved. Contrariwise, when a given search effort does not initially prove effective, additional clusters not already treated can be processed in a subsequent search iteration.

Of particular interest in a library network environment is the fact that individual library organizations can operate with clustered organizations tailored to their particular user interests. Thus if a given organization is especially interested, or expert in a particular subject area, the corresponding cluster structure can be refined by breaking up the large standard clusters in that area and replacing them by a greater number of

smaller classes. This requires the generation of additional class vectors, which must be maintained by the automatic file system. As an illustration, the two large cross-hatched clusters in the illustration of fig. 1 are refined in the example of fig. 2. In that case, the two original classes are replaced by six new ones. The converse operation can also be performed by coalescing a number of smaller clusters into a few larger ones when the local interest in a given subject area is general rather than specific.

It is now clear how a search system can be adapted to individual library requirements in a network environment: each library specifies its principal interests (which may incidentally change from time to time). When a search request is submitted by a given organization, a general search can be conducted based on a comparison of the query with a few large class vectors; alternatively, a more refined cluster structure tailored to the particular library organization can be used. The automated system based on a central union catalog structure is then charged with the maintenance of various auxiliary clustered file structures adapted to the requirements of individual network participants.

The same overall considerations apply to collection maintenance and control.^{25,26} When a clustered file is used for search purposes, it is easy to collect effectiveness indicators for individual document clusters. For example, each time a given cluster is chosen for a detailed search (that is, whenever the corresponding documents are individually compared with the search requests) a cluster parameter expressing the value of that cluster in the particular user environment can be increased; alternatively, the cluster parameter can be decreased whenever the similarity between a user query and the given cluster vector falls below a given threshold. In each case, the aim is to monitor dynamically the importance of individual clusters for particular user environments. Given such cluster value indicators, it is now easy to design a search system which gives preference to clusters exhibiting high success probabilities; contrariwise, a decision may be made to search the less productive clusters only upon special demand.

These dynamic collection control procedures carried out separately for individual library organizations can also be utilized for the specifications of physical document storage arrangements. Thus, the actual documents

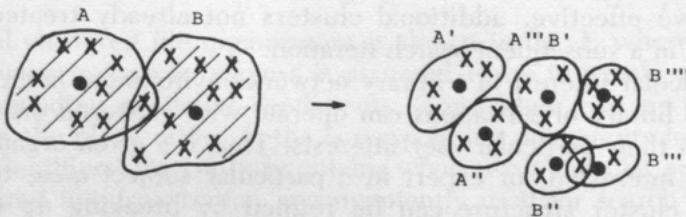


Fig. 2. Refining of Cluster Organization.

corresponding to the less productive cluster structures can be relegated to peripheral storage warehouses, or to deposit libraries maintained jointly by several library organizations. Access to such peripheral storage locations may be restricted, and may in any case be slower and more costly than access to the core collection. The physical multilevel store can then be treated dynamically like the mechanized cluster structure in that documents can be moved back and forth from one storage level to another as the importance of individual document clusters varies during the course of operations.²⁷

SUMMARY

Under current conditions where individual library holdings appear less and less comprehensive and the technical processing requirements are increasingly demanding, the arguments for library cooperation and network organizations are compelling. In such circumstances, the housekeeping operations can be done cooperatively, and the collection development can be performed jointly for a given library group.

At the same time, each library can maintain its own cataloging and content identification methods, and mechanized storage structures can be used which produce multiple search strategies individually tailored to the interests of local user populations. Dynamic collection control methods can also be included to monitor collection usage for individual library environments, and multilevel storage structures can be maintained in accordance with the user characteristics of individual local centers.

From a technical viewpoint, a library network organization presents no obvious disadvantages. Indeed, by saving resources now devoted to separate housekeeping and collection control operations, each participating library will necessarily be strengthened. Unfortunately, the human, administrative and social problems remain to be solved. A library network always consists of stronger and weaker components. Administrative and financial arrangements must then be devised which appear satisfactory to all concerned. Some attention must also be devoted to the problem of privacy protection; and, finally, thought must be given to the effect on document sales of liberal copying and interlibrary loan methods. One may hope that these questions can be handled with reasonable good will and fairness on everyone's part.

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An Open Hearing on the Communications Act

The LITA Legislation Committee conducted an open hearing on the Communications Act on January 9, 1979, at the Shoreham Hotel. The hearing was held as part of the Midwinter Meeting of the American Library Association in Washington, DC. Representatives from the library community engaged in a dialogue with staff from the House Subcommittee responsible for rewriting the Communications Act. The discussion was lively and spirited, and unearthed many interesting structural questions dealing with the varied interests of libraries. This is an edited text of the proceedings.

The LITA Legislation Committee deserves substantial credit for making the meeting such a success. Heather Nicoll of the committee was responsible for much organizational work preceding the meeting, while Art Smith of the committee, together with staff from the Battelle Columbus Laboratories in Columbus, Ohio, transcribed the tapes. Ruth Tighe, chair of the committee, moderated the discussion.

Credit is also due to Chip Shooshan, from the House Subcommittee on Communications. Without him the experiment would not have been a dialogue. Finally, of course, those who prepared testimony and spoke formally at the hearing deserve our thanks. The views expressed in the prepared testimony do not necessarily reflect those of the organizations with which the speakers are identified.

RUTH TIGHE: This is a hearing on the Communications Act of 1934 as it may be revised by the Congress. The purpose of this session is to gather information for the American Library Association Washington Office, to support their efforts with Congress as the House Subcommittee on Communications conducts its hearings. There have been a small number of articulate members of the library community who have helped in the effort of the Washington Office, but we would like to see the number of people who can speak to this issue grow within the association membership. For this reason we hope that, in addition to providing input to the ALA Washington Office and, of course, to the House Subcommittee staff, this hearing will result in an increased awareness and interest among ALA members in the issues and how they relate to the library community.

We will begin by having a staff member from the House Subcommittee on Communications give us an overview and some background on the Communications Act itself. A revision of the Communications Act was prepared and submitted to the last session of Congress, but it died when Congress adjourned. There were extensive hearings conducted throughout that session, and as a result the bill is being revised. However, the new version of that bill has not been submitted because the new Congress is not yet in session. Since this

is the case, we have asked that comments on the bill be general as opposed to addressing details of the previous bill that could be changed. We want to concentrate on the thrust of the bill, the direction we think it ought to go.

We have asked several people to prepare brief comments on particular subject areas of the bill, and after the overview statement, they will submit testimony to the rest of us from the floor. After each speaks, there will be a reaction from our main speaker, and then the forum will be open for questions and comments from the floor. The areas we are going to address specifically are: new technology, cable video, networks, public broadcasting, community information services, and the information component of the Communications Act.

It gives me a great deal of pleasure to welcome here to our meeting Chip Shooshan. Chip is the chief counsel and staff director of the Subcommittee on Communications of the House Committee on Interstate and Foreign Commerce. He has served there since October 1974. He has played a leading role in the work of the subcommittee in doing the revision, and we are very grateful to him for taking the time to come and make this presentation to us today. He has volunteered to add to this hearing by questioning each person who presents testimony. So be forewarned.

Opening Remarks and Overview by

Harry M. Shooshan, III

Chief Counsel, Subcommittee on Communications,
House Committee on Interstate and Foreign Commerce

Thank you very much, Ruth. Be forewarned but don't be intimidated; the questions will all be softballs. I am very happy to be here to talk to this group of the American Library Association.

The Communications Act rewrite and what it means for a lot of people has been on minds and tongues of many here in Washington, and I trust in other places around the country as well. Rather than deal with the specifics of the bill, which many of you have had a chance to look at, and, especially, since we are revising the rewrite right now, I would like to talk generally today about the philosophy behind the new legislation and the concerns that we have about the existing Communications Act.

I think it is important to start with the roots of the 1934 act. The year 1934 seems a long time ago to most of us, I suspect, but you have to go back even farther than that to find the genesis of the Communications Act. In fact, the provisions in Title II of the act that relate to common carrier stem from the Interstate Commerce Act of 1887. The provisions in the bill that deal with broadcasting are largely taken from the Radio Act of 1927. Clearly, the world in 1887 or 1927 looked different today in terms of the available technology and the degree of development of communications media in this country. But it is with that 1934 Act that we are still trying to make communications policy in this country today. We are doing it largely on the basis of delegated authority from Congress to the Federal Communications Commission (FCC). Fundamental to this is a concept of the public interest, convenience, and necessity. That is the standard by which the Congress told the FCC to do its job, and public interest has been rather creatively interpreted by the FCC over the years. I thought, coming up here today, of four examples. I'm sure if we stayed here for awhile this afternoon we could find many more.

• Acting under this "clear" standard and mandate from the Congress, the FCC in 1959 and 1960 decided there was absolutely no reason or rationale for regulating cable television. But in 1966, the commission turned around 180 degrees and imposed what amounted to a decade of onerous regulation on the development of cable television in this country today. They were acting under the same piece of legislation without a single amendment or change in that law on the part of Congress.

• In the early 1950s the FCC was faced with pressure to open up common carrier communications to competition. The commission said no. Competition to the extent that it is viable and accepted must be proved to be in the public interest beyond a reasonable doubt. Essentially, that was the stand the commission took in many cases in the late 1940s and early 1950s. In 1959 and 1960 in what are referred to as the "above 890 microwave decisions" which opened up portions of the microwave band to noncommon carrier companies, the commission again made an 180 degree turn—a complete about-face—and began what has amounted again to, in this case, a two-decade history of introducing competition in the area of common carrier. Again, it is important to note they did it under the same statute without any new guidance or changes in that statute from the Congress.

• Let's look at how the commission handled an established industry, to the extent there were any established communications industries in 1934. The radio broadcasting industry was just beginning to get established. At that point the FCC was faced with a radio industry that numbered about 2,000 stations. Today, there are in excess of 8,000 commercial radio stations in the country. Yet the amount and degree of federal regulation of radio broadcasters have increased, not diminished, as the number of radio stations has grown. The question that has been raised is why is more regulation of an industry like commercial radio in a city like Washington needed where there are now forty radio stations available off the air, in a city like New York where there are fifty or sixty, in a city like Los Angeles where there are seventy to seventy-five. Again, this has been a trend and a development under the act the way it was promulgated in 1934.

• One fairly recent decision of the commission probably could be cited as a good decision. I know there are others; I am obviously picking the worst examples to make my point. The commission, in the early part of this decade, decided that in developing domestic communication satellites they would adopt an open skies policy. That is, anyone who wanted to come in and provide domestic satellite communication service would have the opportunity to do that. So that was a policy where the commission, even using the hindsight of today, probably made the right decision. Now, the kicker. The commission, until 1976, said that people who wanted to put up an earth station to receive a signal from one of these satellites, just to receive, not to transmit anything, could not employ a dish smaller than 9½ meters. Now, 9½ meter dishes in 1976 cost about a quarter of a million dollars or thereabouts. So one can imagine very few people were deploying those receive-only dishes at that time. Well, under a lot of pressure from our committee and from others, the commission eliminated that standard, which they had maintained was important to protect the user, and since that time the number of small earth stations has proliferated at an unbelievable rate. The primary beneficiaries have been cable

stations, but now even broadcast stations and others are beginning to use this new technology. Today you can buy a 4½ meter dish, I understand, for as little as \$12,000 which indicates, I think, that change in that one decision has meant the opening of amazing new opportunities in the use of communications technology.

Again, I could bore you with more examples of where the regulatory landscape of the FCC is strewn with the corpses of new technology. One that the chairman of our subcommittee, Mr. Van Deerlin, cites all the time, is the fits and starts with which the commission developed FM radio in this country. We could go on and on. But the primary flaw as we see it in the 1934 Act is that the standard "public interest, convenience, and necessity"—while it sounds good and in theory works well—is really no standard at all. It is whatever the FCC sitting at a particular time wants to interpret it to mean. As a result of the interest we've taken in revising the Communications Act, not just the House now, but the Senate project as well, Congress is now willing to make up its mind in a specific way, and say what it wants about the direction of communications policy today. And when we talk, and we've been criticized for this, about eliminating the public interest standard, what we are really talking about is giving some definition, for the first time really, to the direction in which communication policy should go.

Our bill has been misread in some quarters as abolishing regulation. It does no such thing. It simply says as clearly as we could get the king's English to read in section 101, "The Congress hereby finds that regulation of interstate and foreign telecommunications is necessary to the extent marketplace forces are deficient." In other words, when the commission decides to regulate, it must first make a finding that the marketplace is not working, that there needs to be a specific regulation adopted, and that it must identify both the benefits and the costs of that regulation.

This leads me to the second point, which is the particular problem we are running into in our efforts to deregulate much of communications as it exists today. For years the common denominator in discussing communications has been to point to all the benefits of communications regulation. But very few people have focused on the cost of regulation, and that's something that we are at least raising for the first time in the area of communications. It's especially appropriate, I feel, in this area where, unlike airlines, there are new technologies becoming available daily to be implemented to meet societal needs. And the question is largely, we feel, how can we effectively remove regulatory legislative and judicial barriers to the implementation of that technology?

If you read this Sunday's *New York Times*, you realize that according to one *Times* writer, Washington, known for its susceptibility to fevers, has come down with a major one called deregulation virus. The article points out some very interesting things. It refers to a study done by a couple of economists at Washington University in St. Louis about the total annual cost in 1976 of federal regulation. The price tag they attach to it, and, admittedly, they say it may be low, is \$66 billion. The same economists say that by 1979 that figure could easily grow to \$103 billion. Let's look at it in terms of the FCC.

According to a recent report issued by the General Accounting Office (GAO), the FCC leads all other federal agencies, except the IRS whose reporting bur-

den is placed on all of us, in imposing burdensome paperwork and reporting requirements. The GAO found that people regulated by the FCC spend more than forty million hours annually filling out reports, applications and other forms required by the FCC, and that the total cost to these industries, and I would suggest to the public that's paying the price for this regulation, is \$450 million yearly. That's the cost to these industries of regulation. In addition, the public must bear the now \$72 to \$75 million a year budget of the FCC.

Now, again, I want to stress that I'm not suggesting, and neither has the leadership of our subcommittee, that FCC regulation isn't worth the cost or that the benefits are dwarfed by the costs. That is not true. There are many areas where FCC regulations have proved to be useful. But the point is that a regulatory agency approaches each new challenge with a primary goal, to regulate it. That in fact, is the imperative of a regulatory commission. It's what the FCC instinctively attempts to do. I've said glibly before, the Commission's philosophy has been "if it moves, regulate it." More accurately, "if it's communications, regulate it." That has basically been borne out by most of the decisions even by the current FCC. So the thrust of our legislation is to call into question the value of regulation in many areas of communication and to opt for marketplace forces for competition, for vigorous enforcement of the antitrust laws in dealing with what we perceive to be problems in communications today, and to give an opportunity for new technology to be developed and to be applied to the needs of society.

That, in a nutshell, is the theory with which we approach this new revamping of the Communications Act. Let me step back for a minute and give you an idea of the time frame that we are dealing with here. As I said, we had extensive hearings last year. I've been associated with Congress for ten years, and I've never seen anything like it myself. There have been thirty-three days of hearings, 484 witnesses last year, including field hearings in six cities around the United States on this new legislation. The bill died with all legislation that had not been acted on at the end of the ninety-fifth Congress. New legislation will be introduced. Our current time frame is the middle of next month, the middle of February. Additional hearings will be held this year.

This project, which was really the dream and the initiative of Congressman Van Deerlin, our chairman from California, and Congressman Louis Fry from Florida, who is leaving the Congress this year, began two years ago, and there were very few people who thought the project worthwhile. Today I can report, just about two years later, that the initiative has been endorsed by the administration through Henry Geller. And a parallel project is under way on the Senate side spearheaded by Senator Ernest Hollings of South Carolina and Senator Harrison Schmidt of New Mexico. Hopefully, there will be a bipartisan effort. Many of the industries regulated by the commission that have viewed regulation as a security blanket if you will, are now realizing that change is inevitable and necessary. It will be forced on them and on society by technology, and we can do it in an unstructured way, or we can look for a framework to allow the introduction of new technology by opening areas up to competition through the vehicle of new legislation.

We have a long road ahead of us, and that's why we were very happy to meet with representatives of the ALA today to hear your concerns and learn from you what direction you would like to see communications policy and new

legislation take. We would urge you to continue to be interested and involved when you leave this meeting here this week. I am sure that in what I hear in the next hour or so, there will be some criticism of what we propose and that's understandable. We've been hearing a great deal of criticism for the last six months since the bill was introduced.

I would like to end my initial presentation with remarks made recently by Alfred Kahn who has now taken the thankless job of inflation fighter for President Carter, but did, I think, an admirable job in the area of airline deregulation, and before that, as chairman of the New York State Public Service Commission. He showed some of the most creative approaches with the common carrier regulation of the telephone company that have been evidenced by any state commission in recent years. Kahn was talking in Chicago recently about who bears the burden of proof when someone advocates change, and I'd like to share a quote with you from that speech. He said, "One of the most fascinating aspects of the public policy disputation that I've been participating in during the last four years is the widespread acceptance of the notion that the burden of proof rests always with the advocates of change; that even if one is dealing with manifestly irrational, if not occasionally idiotic arrangements, the advocate of moving in the direction of rationality is called upon to predict exactly how the process will work out and to prove beyond all doubt that it will work perfectly." I can assure you that when we leave here today you will understand or you will have the feeling that I have not been able to predict with exactitude what effect this new rewrite will have on the concerns that you are here to represent today. But I can also assure you as I listen to your concerns about this bill, that we have not cornered the market on rationality in what we propose. So I'm here to listen and perhaps ask some constructive questions.

RUTH TIGHE: Chip, you started off by saying something about the time frame within which you were going to operate and you got as far as saying that the bill would be submitted in the middle of February and that there would be hearings. Are you willing to stick your neck out far enough to say when you think there will be action on the bill or how long it will take? There have been comments that it will be years and years.

CHIP SHOOSHAN: Well, fortunately, I don't have to stick my neck out on that one. Mr. Van Deerlin, who knows the legislative process far better than I do, has indicated he feels that there will be action during the ninety-sixth Congress, which will be this year or next year, with final action next year. Senator Schmidt, who is very involved on the Senate side, indicated in an interview published this week that he feels that there is every reason to expect final action will be taken by the ninety-sixth Congress. So I don't even have to make a personal prediction to say that I think the ninety-sixth Congress is going to produce the most important communications policy since the Congress enacted the Communications Act of 1934.

RUTH TIGHE: We have a few minutes if somebody would like to ask questions at this point before we hear from some of the people who have been scheduled to testify.

JOHN LINFORD: How much of the present bill in its rewrite is lifted from the Consumer Communications Act?

CHIP SHOOSHAN: I think those people who were the proponents of the rather beguilingly entitled Consumer Communications Reform Act were really surprised when the new rewrite legislation was introduced last June. We have opted, really, for a far different philosophy than the people proposing that legislation. The so-called Consumer Communications Reform Act was an effort by the established telephone industry to continue the end-to-end monopoly that had existed for many years in the area of common carriers. H.R. 13015, the Communications Act rewrite, rejected that philosophy and said rather that the common carrier area should be open to competition.

Now, the reason we did that is because we feel that the forces of technology, more than anything else, are creating change. The 1934 act was predicated upon the concept of an end-to-end monopoly in telephone service. Well, that just no longer exists. For example, there was a recent proposal made, which many of you may be familiar with, that was made by the Xerox corporation to offer what is referred to as XTEN service. Now, XTEN service, without going into great detail, would use domestic communication satellites for the intercity link and would use radio common carriage, cellular radio technology to connect the satellite earth station to the users who are using XTEN service in the 200 city network that Xerox proposes. At no time would any message over that XTEN service be moved through a telephone company facility. That's now possible, given technology. It was not possible fifteen or twenty years ago. So our feeling is that the best approach to take is to opt for fair competition. At the same time as introducing competition into the telephone industry as it exists today, there should be some mechanisms short of preserving end-to-end monopoly to make sure that the average consumer's telephone rates don't go up dramatically as a result of the advent of technology. Again, whether we have done that successfully in the first version is open to discussion, but that is the line of thought we are pursuing.

JOHN KOUNTZ: How much intervention from the local Public Utility Commissions will there be after this bill is passed? In other words, deregulating on a federal level will obviously open the ballpark for local legislation. Is there any prognostication on that?

CHIP SHOOSHAN: Well, it's hard to answer in general terms. But in regard to telephone service, the bill would leave the regulation of local telephone rates to the states, much as it is today. The change that would be made by our legislation is that the federal commission would assume jurisdiction over all intercity telephone services—in other words, even those situations where a call moves between two cities within a state. The way things are set up today, with this crazy quilt division of regulatory responsibility, it is cheaper for someone living in Rochester, New York to call Los Angeles or San Diego than it is for them to call New York City. There would still be regulation of local exchange telephone service by the state with full opportunity for public groups and others to intervene in rate cases at the state level. The same philosophy would hold true of cable, where we feel that most decisions should be made at the state and local level where those systems and services are closer to the people. We have taken a rather skeptical view of the philosophy that the federal government can make decisions for everyone. We are taking a step back and questioning the degree to which regulation is necessary, and the degree to which it must be done at the federal level in all of these areas.

JOHN KOUNTZ: Will the FCC role in controlling frequency allocation continue the same as today?

CHIP SHOOSHAN: That question is very appropriate because today as we are sitting here, there is a briefing being given elsewhere in the city in preparation for the World Administrative Radio Conference (WARC), that will be held later this year. A good deal of frequency assignment and allocation will be made at this conference. Actually, our evaluation is that spectrum planning has been done very poorly in this country in the past, and therefore, we have proposed a diminished role for the FCC. The FCC would still be involved in the actual assignment of frequencies to particular services and within particular services, but the spectrum management tasks, which are necessary in an overall sense, spectrum planning and spectrum negotiations with other countries will be done through a new entity. A National Telecommunications Agency would be created under this bill and really would be a strengthening of the current NTIA located in the Commerce Department. Ironically, the current administration has eliminated the White House Office of Telecommunications Policy and moved it into the Commerce Department. The feeling in Congress is that, that is the opposite direction of what makes sense—that we should be giving communications policy issues greater visibility within the executive branch. This legislation proposes to create a new National Telecommunications Agency that would be charged with a lot of this responsibility on a day-to-day basis. That is the approach we have taken.

RUTH TICHE: Thank you, Chip. The first on the list of witnesses to appear this afternoon is Tom Harnish from OCLC, who is the program manager for the research program on home delivery of library services. I was most intrigued to discover that OCLC had even established such a section within its conglomerate organization. So, Tom, would you please give your testimony?

Statement of
Thomas Harnish
Program Manager for the OCLC, Inc.
Research Program on Home Delivery of Library Services

On the same day that the House Communications Subcommittee unveiled H.R. 13015—The Communications Act of 1978—the OCLC Research Department embarked on a program of continuing research on behalf of our member libraries directed toward the home delivery of library services.

We made an early decision, based on the computerized and teleprocessing nature of our current OCLC endeavors, to examine only electronic means for delivery of services remote or offsite from the sponsoring library and not, to consider, say, bookmobile. That decision insured that the two time-lines begun June 7, 1978 should cross today. I am pleased to participate in this forum on the "rewrite" or "son of rewrite" as someone has called the newest version.

The reason I believe that these two efforts have come to intersect today is due to three factors:

- the changing role of libraries,
- the emerging technologies, and
- the evolving services and products libraries offer today (or will offer in the future).

These same factors are, in my opinion, the root of the considerable concern, close scrutiny, and deep interest shown by the library community in the outcome of the Communications Act rewrite.

The first reason for the great interest in the rewrite by the library community is due to the changing role of libraries. Early libraries resulted from efforts to possess the few precious recorded words that existed. But, we realized today that mere possession of information is not necessarily the answer—literally and figuratively. So, libraries are no longer just repositories for books, but sources of information with emphasis on access, and that means communication. Librarians and information scientists have increasingly planned, developed and implemented services and networks that place emphasis on access and dissemination.

The second reason for our interest stems from the rapid advances in technology. In 1979, and in the future years when the rewritten Communications Act will regulate our endeavors, the means to library access and for information dissemination will be increasingly through computers and communication. At OCLC we have a number of research projects underway, virtually every one impacted by the outcome of the rewrite. Each of these projects is intimately involved in the explosive development of information and communication technologies including cable TV, mini- and microcomputers, video disc, satellite transmission, and other methods that libraries may use to provide access to information. For example, we are in the early stages of an experiment with a unique interactive cable TV system in Columbus, Ohio. In addition, this month we begin a communications test with four library network offices in Dallas and here in Washington using an FM-subcarrier broadcast system that allows simultaneous and economic delivery of technical information anywhere in the U.S. in as little as sixty seconds, all for about the cost of a stamp, or at least we hope so. That is one of the test questions. This system also permits access to a wide variety of other information that could be offered through libraries—but that is still another project. The first project we initiated in June was to evaluate the feasibility of using systems like viewdata or Teletext to provide a number of interesting home information services through libraries.

This leads to the last of the three factors I mentioned earlier: the evolving services currently offered by libraries and those which libraries may offer their patrons in the future. Many of them are potentially affected by the rewrite act. As libraries' view of themselves and their role has changed, so have the services they offer. Today, thanks to your local library, you can play a game of Star Trek on a computer, listen by phone to a tape on glaucoma, watch an educational program at home on cable TV, hear a radio broadcast book review, and even borrow a book. Tomorrow? All of the above; but also, libraries could possibly become the information source of choice. A source of information when and how you need it. The technological developments that the new Communications Act will either encourage or impede can make ready access both feasible and desirable. In fact, libraries could even be self-supporting revenue generators. Doesn't that bring up some interesting regulatory questions? The Corporation for Public Broadcasting and PBS have often been associated with the idea of a "fourth network." I wonder how the Communications Act of 19XX would handle the situation if libraries as a group offered the follow-on technology in the radio-TV evolutionary chain? The rewrite act will have a direct im-

impact on the future of libraries through the technologies that it regulates and how the regulation is carried out.

I was taught in grammar school that statements were sentences that ended with periods, but I would like to end this statement with a few sentences that end with question marks.

- If cable is deregulated what will prevent uneven regulation at the local level?

- Competition and demands of the market place dictate that you roll out a new product which the consumer will buy and can afford to buy; but, on the other hand, won't that create a need for a whole new series of federal programs for a new social syndrome—the "informationally disadvantaged"?

- Could the rewrite act be constructed to direct and assist, in a proactive sense, new information communication technologies by providing an environment for growth so that severe restriction and regulation—such as occurred in the early days of radio—are never necessary?

- Could the new act contain the requirements to reflect technological changes as they occur rather than through rewrite? Or will this effort end up like the rewrite of the 1927 Radio Act—which when enacted in 1934 was already obsolete?

Existing new technologies have given libraries the opportunity to have an exciting effect on the quality of life of their patrons through increased access to information, and thereby, access to a larger number of options in whatever they do. The rewrite of the Communications Act has equally exciting opportunities to nurture the development of these new technologies. We earnestly hope that the new act will reflect the fact that change is both inevitable and necessary and provides a viable framework for future developments. From your opening comments, it appears that these requirements are recognized, and we look forward to the outcome of the rewrite effort.

CHIP SHOOSHAN: That was an extremely articulate statement about the opportunity that new technology presents for libraries, and I am happy to see so much attention being given to the changing status of the library as a resource within a community. I wonder if you have considered—as you talk about libraries and their involvement in what are essentially computer message systems—what impact the entry of the U.S. Postal Service would have on the whole future of electronic message systems in this country. Is that being looked at by anyone associated with your group?

THOMAS HARNISH: We haven't addressed that specifically, but it seems certain that deregulation or change in regulation could very well impact this whole area.

CHIP SHOOSHAN: The point I was raising was that the development of electronic message systems—and that could involve voice, data, or hard copy—is a tremendously important expanding area of technology in this country today. There is a lot of discussion about how this technology ought to develop. Again, our view is basically a hands-off policy.

One of the interesting tangential questions is what happens if and when the Postal Service becomes involved in offering electronic message systems, because there are private express statutes that basically prohibit anyone but the postal service from delivering your mail. What happens when the mail is deliv-

ered electronically and when part of the mail is information that someone is accessing from a local library? I think these are questions, which need to be pursued, that fall outside our jurisdiction.

You asked about uneven regulation of cable. It is not clear to me to what extent cable needs to be regulated. Perhaps, that is a decision each state ought to be able to make for itself. I know that the cable industry has said that the result of federal deregulation without preemption of states will result in patchwork regulation. But I haven't been convinced yet that there is a national interest in putting the weight of government behind the development of cable television technology, and if we did, I don't know what direction we would want to push cable in at this point right now.

In terms of your concern about new technologies and their applications: not only the rewrite but the new Public Broadcasting Act, which was enacted in the closing months of the last congress, made a major change in the thrust of the future of public broadcasting by giving public broadcasters what we think is the beginning of a new mandate to become public telecommunications centers in their communities. This will move them away from the idea of being a fourth network and more toward serving the obligations they have in a local community, which may be to provide facilities and services as a public telecommunications center. I think the opportunities we could envision for an interface between libraries in the community and a local public broadcasting station or public telecommunication station, as we might refer to it, are really unlimited. I think we have beefed up the facilities program to provide for some innovative applications of technology at the local level using the public broadcasting station as a starting point. We are trying to work along those lines, and would be happy to get any thoughts and specifics you have on this question.

RUTH TIGHE: The next witness on our schedule this afternoon is Lynne Bradley, who will talk about video and cable. Lynne is the media librarian at the Washington, D.C. Public Library and chairperson of the Video Cable and Communication Section (VCCS) of the Library and Information Technology Association.

**Statement of
Lynne E. Bradley
Chairperson, LITA Video and Cable
Communications Section (VCCS)**

Mr. Shooshan, thank you for sharing your time with us today. We congratulate the subcommittee on beginning a very difficult task. We are very anxious to see a new Communications Act. The American Library Association has already submitted testimony and comments on the first draft of the rewrite and we look forward to continuing the dialogue. There are many complex issues raised by the revision. The Video and Cable Communications Section of ALA feels that two of the most important issues are the absence of the "public interest" statement and the deregulation of cable television.

As librarians in the information business, we are hopeful that the new Communications Act will improve the delivery of information by both the existing and emerging telecommunications technologies. We want to underscore earlier testimony presented by the American Library Association—namely, that the phrase "the public interest, convenience, and necessity" be kept in the bill.

Our concern is not merely semantic. We want to see these words included as a reaffirmation of the commitment of the federal government to maintain telecommunications resources in the public interest.

One justification for including and specifying the wording "public interest, convenience, and necessity" in the revision is that the role of federal regulation in communications has fundamentally the same tradition and philosophy that guides libraries. The special role of libraries is not that they have traditionally had books, but that libraries are supposed to provide a wide variety of points of view which our citizens can explore and choose. Now, libraries have more than just books but the role is the same—to protect intellectual freedom and the freedom of information. This fundamental philosophy, that is, that our citizens have a right to as many sources of communications (i.e., information) as possible has also guided the role of federal regulation in the communications industries.

We are the public and we serve the public. We do not feel that the marketplace should be the exclusive arbiter for resolving the disputes and issues of such important resources as telecommunications.

This is especially true in the case of cable television which H.R. 13015 has totally deregulated at the federal level. We do not want to see the federal government entirely remove itself from this important area. We understand the difficulty the Federal Communications Commission has had in regulating cable. Cable television does not fit neatly into the other types of technologies handled by the commission. Cable regulation at the federal level has had a rocky road—first, there was no regulation, then some regulation, then more—and much of it changed through litigation. Because earlier types of regulation have not worked does not mean there is no need for some type of federal regulation.

One of the most important areas to us is *public access*. We are afraid that the marketplace alone will not protect the community's right to public access. The persons and corporations who can afford to become involved with the cable marketplace may not provide an access channel when a lucrative leased channel could bring profits.

Members of the Video and Cable Communication Section of ALA have been involved with cable television in many ways. Some have been active during the ordinance and franchising process; others are actually programming public access cable channels; still others are producing videotapes and such materials for distribution on cable systems. Our members report that without FCC rules mandating access channels, or channel, no such access opportunities would exist in their communities. This is not the sentiment of a few committee members but is a consensus of a section of ALA with members working in several hundred libraries across the country.

Another important area of concern is the concern for technical standards, especially interconnectability. It has been suggested in option papers submitted by the subcommittee staff that rather than dropping all cable regulation, a new act could initiate a period of experimentation with cable. We encourage the subcommittee to reconsider and not completely abandon its role to protect the public interest. Our members want the backup of federal regulation to insure that public access and technical standards will be maintained in our communities' cable systems.

I hope you'll bear with me while I tell you an anecdote. At one time, I was

working in a library system at a community debate on some local election issues. Unfortunately, there was no local cable system on which we could send out the program. One of the candidates called us and was very concerned about the amount of time he would have on the panel. Using the equal time doctrine, he threatened to take us before the Federal Communications Commission if he did not have exactly equal time on the podium as the other speakers. While this person may have been misguided in his threats to take the library board, the library director, and myself before the FCC, his perception that the library and the FCC have similar responsibilities—namely to provide access for a wide range of points of view—was revealing.

The futurists say that the number and variety of information channels and communications resources in the years to come will be astronomical. As information specialists and librarians, we are looking forward to this new age where there will be channel multiplicity and the guarantee of the right of the public to utilize some of these channels.

May I emphasize again that we strongly encourage the subcommittee to return the "public interest" statements and the protection of national standards for cable television to the bill. The marketplace alone should not be the sole protector of our national freedom of information.

CHIP SHOOSHAN: I have a couple of quick questions to ask you, if I could. I wonder, because this is something we have wrestled with very, very hard, and I think we are concerned with this question of access, about the control of information distribution technologies by a handful of people. It is an important area, and one of our major concerns in cable which is developing in a very concentrated fashion today. What rationale would you suggest for the federal government imposing on a cable operator, a private businessman who is in the business of providing broadband channels into the home, to provide free access channels to any group? What is the basis for requiring that?

LYNNE BRADLEY: I feel like Miss America, you know where they have all those questions. Not that I would win of course. First of all, perhaps as Mr. Kahn suggested, the burden of proof is on those who want the change. If people could assure us that the price of broadband channels would be something that libraries and other community groups could afford, then we might be more open to that kind of suggestion. Some of this is a matter of faith at this point because we cannot afford to lease many of the channels that are available. They are being used for more lucrative endeavors, and we cannot participate in the marketplace in that fashion.

CHIP SHOOSHAN: I agree with your concerns, and I think that it is a very tough area for us, but I guess what I am asking for is even more basic than that. You said that it ought to be the case that access—and you were talking at that point about free access—that this ought to be made available to groups like libraries and others in the community who wanted to use it. I just wanted to know what rationale you would suggest using for the federal government imposing that kind of obligation on a private businessman.

LYNNE BRADLEY: Well, in terms very similar to the broadcast example, there are segments of the public airways that the businessman is using.

CHIP SHOOSHAN: In what way, in regard to cable?

LYNNE BRADLEY: In cable there are often limited channels. If all of them are

designated as broadcast channels or other kinds of leased channels, what is left over for the public to put their messages on? There are, in fact, examples of libraries who have leased channels for access. Many of our libraries are going out and paying so that they can produce and develop materials to put on the system. We feel that these communication resources belong to all of us, and everyone should have some vehicle by which they can use this channel.

CHIP SHOOSHAN: I don't want the questions to be taken as hostile, because we are very interested in the same kinds of issues. But I would urge you to step back and ask yourself when you say that these resources ought to be available to the public, what resources are you talking about? In broadcasting, you are talking about the spectrum that is being used—where the federal license given to one broadcaster or one taxicab operator precludes everyone else from using it. There is no such use of the spectrum with regard to cable in the delivery of services. But I think your concern, and one that we have too, is how do I get access to that broad highway into the home? I think that is a terribly important question where the person who is controlling that access, let it be over 12 channel, 20 channel, 40 channel, or the fiber optic system of the future, controls not only the facility but the content of what moves on that facility. And that is why, for example, one of the things that we are looking at in terms of the new legislative approach, is some form of common carrier status for cable where channels would be the facilities, but they would have to be made available to anyone who can pay to use them. Then, I think your concern becomes, will the rate charged be affordable? And my feeling is there are lots of ways to regulate rates to assure that this happens. It may be that this is the kind of decision that states and localities will have to make in apportioning their resources as to whether it is more cost-effective to lease a channel on a cable system than it is to provide bookmobile service, or whatever it is in the future.

Let me sum up to say that if one resource is free such as access to cable, and another resource costs you money, such as acquiring books or building libraries, it is always going to seem cheaper to use the free resource. Before you propose it, you have to come forward with a convincing rationale. The other question that I will just throw out, rather than ask you today, is this question that has been emotionally debated. That is, what about telephone companies themselves providing broadband services, again as they have done traditionally on a common carrier basis? The telephone company could provide the broadband facilities and groups like libraries and others in the community could come and lease channels on a telephone company provided broadband highway. Current FCC rules prohibit the telephone companies from owning a cable system. The telephone company cannot own the cable head end and cannot provide the direct service, even in terms of facilities from the point of origination to the customer. That is a question we have to deal with in the context of the rewrite, and I hope that you would look at it in terms of information delivery as well.

BRIGITE KENNEY: It seems to me in the early days, when there were three mandated access channels, one rationale was that cable television would be a medium of abundance. There would be many, many channels, and for the public necessity and convenience, if you will, some would be set aside for public use by tax-supported institutions. There is one other thing I would like to bring into the picture, and this goes a little bit beyond cable. There has been some think-

ing among ourselves, among librarians, and we have gone on record a couple of times saying that if indeed we are an information transfer mechanism using technology and if information is for the public good, we should request that telecommunication channels of all kinds be made available at preferential rates for organizations such as libraries. This might be another rationale that could be used.

CHIP SHOOSHAN: If I didn't know better, I would think you had bugged our offices. We were talking about just that. That is the kind of approach that seems to us to have a great deal of merit. This is very important where we are talking about common carrier, because a common carrier must make services available to everyone at the same rates. You can't discriminate. But you could provide in the statute the ability for that carrier to provide preferential rates to certain groups. This was done in the Public Broadcasting Act, the original act, stating that AT&T, in providing the interconnection for public broadcasting, could do so under preferential rates. That was necessary and very proper because again, there was a rationale for requiring access.

In our discussion here regarding cable, I suppose the rationale is that when a cable company uses that public right of way to string its cable, the public—that is the franchising entity whether it be a state or, as in most cases, a county or city—can make demands upon that businessman as a trade-off for using those rights of way. But my question, going back to Lynne Bradley's testimony was, isn't that more properly a decision that should be made on the local level where the franchise is being let? What's the basis for the federal government making that decision where the resource being used, the right of way, is really a local good that is being made available? So these are the kinds of questions we are trying to answer.

**Statement of
Raymond DeBuse
Associate Director for Network,
Washington State Library**

The Washington State Library administers the Washington Library Network (WLN), a small but growing automated library network, or bibliographic entity that supplies cataloging, ordering, and other kinds of bibliographic information to libraries via on-line computer facilities. Such utilities today serve nearly two thousand libraries in the U.S. over thousands of miles of leased telephone lines and through a variety of dialed toll service carriers. This reliance upon the telecommunications common carriers by library network operations is increasing steadily and will continue to do so as new services and extensions of existing services are developed for libraries. Some of these services will almost certainly be delivered directly to homes and offices, perhaps via cable as well as telephone lines.

We are, therefore, vitally concerned about the structure and regulation of the telecommunications common carriers as these will be affected by the proposed legislation. We must be assured of the ready availability of reliable and affordable communications channels.

The encouragement of increased competition in the common carrier arena sought by the legislation could prove highly beneficial to bibliographic data utilities. In particular, I am pleased to see the interconnect guarantee. While

the current standard of service is reasonably good, we regularly experience frustrations in obtaining responsive service from telephone companies which many of us feel is the direct result of their monopoly status. We also see rates that in some instances appear arbitrarily high, even though they have resulted from a regulatory process. With the rapidly changing technology of telecommunications, greater competition is becoming more feasible.

Yet, we must proceed with caution toward deregulation; that deregulation of other industries has yielded benefits does not mean that a similar pattern will be followed in the telecommunications industry. Telecommunications remains highly capital intensive. It also has an enormous capability to affect the public interest. There is no guarantee that under deregulation, monopolies will not be perpetuated or even increased. This, along with the primary business objective of maximizing return on capital, could yield very uneven communication service and pricing across the country.

I would prefer to see a continued federal regulatory role in seeking common carrier commitment to provide service in the public interest, convenience, and necessity. In an industry undergoing drastic changes, potentially both in structure and technology, we must be assured a certain amount of stability.

A second major concern to many of us in the computer-based "bibliographic data utilities" is that the bill as drafted does not take into account the increasing difficulty in distinguishing between information processing and information communication. Value-added carriers are doing both, as would AT&T with its ACS offering. The Washington Library Network is moving toward a major reliance upon distributed processing for certain parts of its service, and telecommunications will have to be even more an integrated part of the processing environment than it is now.

To separate information and telecommunications at the federal policy level will lead to confusion. For the sake of all major information institutions, including the government itself, there must be a mechanism for considering telecommunications in the context of the information policy.

Furthermore, looking in another direction, it has long been a principle of U.S. communications policy that there is potential danger in allowing a concentration in a single entity of control over information content and information delivery facilities, where that entity is a monopoly. Until we can be assured that existing monopolies vanish and new ones do not arise, we should continue to place some limitation upon the ability of common carriers to enter the information processing field, even if the processing they could provide might initially appear beneficial to many of us in the processing fields.

Similarly, information processing entities should not be immediately allowed to offer common carrier services without limitation. To allow otherwise is to risk a potentially unhealthy vertical integration in the telecommunication and information industries which could take years to undo.

I suspect that the subcommittee, in drafting the legislation, very early ran into the hard reality: that information is too complex a social and economic phenomenon to allow its being easily addressed in the context of a Communications Act. It thus chose to skirt the issue almost entirely, even removing the word *information* from the title of the present National Telecommunications and Information Administration. This approach may be expedient in achieving major changes in the telecommunications regulatory structure and policy, but

such compartmentalization does not correspond to the world in which libraries, businesses, and individuals operate, and is a disservice to the nation as it struggles to accommodate itself to increasingly difficult information demands and rapidly advancing information technology. To consider telecommunications policy divorced from information policy is as if medical science were to consider circulatory health apart from diet and metabolism.

In summary, I would concur with others who question whether marketplace forces in an industry undergoing unprecedented technological change are sufficient to guarantee service in the best public interest. Further, I urge the subcommittee to include in the legislation a mechanism for insuring that telecommunications policy will be formulated in the context of information policy. As information agencies increase their use of the telecommunications technology, libraries and the data utilities serving them will undoubtedly suffer from the lack of such an approach.

CHIP SHOOSHAN: One of the problems I have with integrating information policy with communications policy is I am not convinced that I know yet what communications policy is or what it ought to be. Although I am very impressed with the quality of your statement and the others that preceded it, I know even less what information policy is or how it can be integrated. Do you see plain old telephone service as part of information policy? Is that affected at all by information policy?

RAYMOND DEBUSE: It seems to me that the federal government, through a variety of programs, supports a large amount of information transfer, and in that context, the government must be concerned with information policy. For example, the National Science Foundation (NSF) is deeply involved in the dissemination of scientific research.

CHIP SHOOSHAN: Relating that to communications policy, we have a jurisdictional problem. Our committee doesn't control NSF, they have their own policies. Nor, do we control what the Education and Labor Committee does. Basically, what we are trying to do is to eliminate as many regulatory and legislative barriers as possible in order to promote the introduction and implementation of communications technology. But it is important, I think, to stress the fact that communication is not an end in itself. It is a delivery system, a series of delivery systems, over which information travels. The FCC is trying to draw the line between computers and communications. The line can't be drawn. It is a fallacy, too, to think that the line between electronic message systems and plain old voice telephone service can be drawn. Basically, we want to get the government out of the business of drawing lines and fitting things into neat boxes. But we would not interfere with the information policy that is being made by the Science and Technology Committee, or the Education and Labor Committee who want to harness that technology to meet societal needs.

Statement of
Suzanne Boles
Community Services Coordinator
Tulsa City-County Library

Though a few libraries over the years have presented book talks and children's story hours over radio, and some have produced these and other types of

programming for television, we are just beginning to realize that we can change the static concept of the "warehouse of information" into a dynamic one through these media. The production of broadcast programs may have been viewed as a real "extra"—"it would be great to . . . but it really isn't necessary." However, the current concerns with expanding the informational resources of libraries, and, quite pragmatically, the need to increase community awareness and support for libraries suggest a more serious assessment of the potential of public broadcasting through use of existing stations or of available noncommercial UHF channels.

Emphasis on Cable TV in recent years has stimulated new thinking of the potential of reaching the public through the media. The Tulsa City-County Library operates the government access cable channel through a studio in the Central Library. Our involvement came about at the height of emphasis, nationally, on Cable—1971-72. The library profession was educating us, the franchise was being fought for in Tulsa, and the LVO Company, one of the bidders on the franchise was promising to make Tulsa Cable a model of community programming. I might add that we are one of the few survivors of the local programming channels. However, three aspects of the present situation are making us take a look at the possibility of switching to public broadcasting:

1. delays in the completion of the cable system—only one-third of the city is wired, though a different management has finally started wiring again.
2. the potential audience size—which will be for a number of years yet the City of Tulsa; the rest of the county has no access to cable but does have public broadcasting, of course.
3. the exciting possibilities of public telecommunications, which have already been discussed here today.

The question is not one individual library system's frustration with one cable company, and it is not a denial of the potential of cable television. The point is that public libraries may be interested in the alternative of public broadcasting. Public broadcasting is technologically capable of doing everything that cable television can do, including two-way capabilities, and it can reach those who have television, but do not choose, or cannot afford a cable hookup. Through public broadcasting, either radio or TV, the various entities in our profession can provide a variety of educational services for those in continuing education programs, for the nonreader, for self-directed learners, to name a few. Informational and cultural services that could be produced either through local libraries, state libraries or associations, or underwritten by the most appropriate of these, would do much to spread our resources to a much wider audience.

With the possible shift of emphasis in a new communications act on public telecommunications over broadcasting, the networking of educational and informational two-way services is thrusting libraries into a new way of thinking about service provision—in a positive way, I think. Cooperation with other providers of these services in a community or geographic area is necessary, of course, in order to provide cost-efficiency to the public. In addition, intra- and interlibrary conferences and training could become more of a reality.

One implication for libraries who decide to take advantage of public broadcasting and/or services through telecommunication, is the need for highly competent and imaginative staff of a different kind: information professionals, computer programmers, staff with radio or TV program production skills, com-

munications experts, and a PR staff that moves beyond publicity to the task of changing the public's concepts of what libraries are all about, and to educating the public in the use of new retrieval skills.

Even though libraries might not be involved in public broadcasting or telecommunications, we can still work to develop stronger ties with existing stations in order to promote libraries, or underwrite programs that help promote the mission of libraries.

Finally, a new communications act must include a number of things for such possibilities to occur.

1. Inclusion of the guarantee of "the public interest, convenience and necessity." After all, this is the reason for any federal communications act.
2. Mechanisms for local programming and local input into policy making which reflect the needs of communities.
3. Clearly stated permission for educational and other public institutions to underwrite programs.
4. Funding for program development and production, and for operational support that emphasizes new programs and services as much as new audiences, so that it becomes unnecessary to tax citizens again and again for quality programs and services.

CHIP SHOOSHAN: Again, I think the thrust and philosophy of your statement is very much in accord with what we have tried to do, toward which the new public broadcasting act moves us. Congresswoman Barbara Mikulski said, "If you take the public's money, you take the public." This is a lesson that public broadcasters are learning the hard way. We are really trying to open up and democratize the process at the public broadcasting station level: open board meetings, open records, just a more open philosophy, and more of an emphasis on local needs, rather than building this fourth national network. One last point. I can understand your frustration given the Tulsa situation, and I am somewhat familiar with that, but I would urge all of you not to give up on cable TV. I think that one of the weaknesses of going to broadcast technology, although it has its benefits, is that it is aimed at a broad audience. You may get your way on to public broadcasting, as we know it today, but unfortunately, it will probably be at 6:00 in the morning on Sunday. That is not to say you shouldn't pursue that, and you shouldn't be a driving force to getting the public broadcasting station transformed in the public telecommunications system, but I think one of the values of libraries as I look at them is that you walk into a library and there are many books for many people, and it is not just shelves of best sellers. I think that the advantage of cable technology is that of providing access to the home through video terminals of a number of different types and various kinds of information and entertainment, and I would urge you not to give up on the broadband future for your needs. I think that we are going to be addressing again the question of how to open that door a little wider for you.

BEVERLY TROST: Allow me to give you a little background about what I am going to ask you. I do not remember living in a house that did not have a telephone in it, but I can remember when the telephone was not an allowable expense under welfare payments. It was considered a luxury. Cable, right now, is seen as a luxury, and a lot of people are saying, "Well I can get a good signal off the air." In other words, they don't understand the potential of it. One of

the problems that I see, since I run a regional educational service agency, and since our cable company has been very generous in offering to build us a discrete 20 channel closed circuit system for 50 buildings in our city that will be separate from the commercial system, is that half of the students will have access to something that another half in the surrounding rural and small towns will not. There is no profit in running cable into a town of 1,200 people at this point, even if we have miraculous fiber optic developments that make it very cheap. Has there been any consideration of writing federal regulatory standards that can be set aside if the state writes its own rules and regulations? If you are reluctant to regulate from the federal level, have you given any consideration to that?

CHIP SHOOSHAN: Yes, we have. If you question us specifically about cable, one example of that is the legislation that passed a couple of years ago dealing with the ability of cable systems to gain attachment rights to telephone company poles. That was a big problem for the cable industry. Basically, we adopted a standard, and said it should be applied by the states, but where the states failed to apply it, the federal government would come in and administer it. So we have looked at these kinds of models, and will continue to look at them.

Reflecting back to the prepared statement, I think it was the case in Tulsa where the cable system came in and said, "We promise to build the entire metropolitan area." Then they stopped, when the more lucrative area was cabled and said, "Well, we cannot afford now to follow through on our commitment." I have seen a lot of great promises in cable franchises because it is a very competitive thing until you get the franchise awarded. Six or seven companies may be competing, and they are going to wire everything from the state university to the mayor's house. The problem raised is a critical one, and that is, how do we, if the government decides it wants to, assure an equivalence of communications service for everyone? The jury is still unclear on whether we want to force this equivalency on people who live in rural areas. There is one school of thought that people live in rural areas to get away from a lot of the problems of urban areas. I would at least like to give people a choice, and one reason we are looking at it again, is that it raises the whole question of allowing telephone companies back into the business of providing broadband service when they must provide facilities to everyone who wants it on a common carrier basis. That's one way you could deal with the problem of making sure that everyone in a particular area was served. We did this with telephone service in 1949. We looked and we saw that about 60 percent of the homes in the country did not have telephone service. So we said let's amend the Rural Electrification Act to provide for loans to telephone companies to serve rural America. These are all questions we are considering, and we hope to propose something that may be more successful than what we proposed the first time.

Statement of
LeRoy Tavares
Tucson Media Corporation,
Tucson, Arizona

Much of what I want to say is going to be redundant in a way, but maybe that's good. The impact of any telecommunications legislation on the citizen-

user of information is a function of the policy goals for that legislation. The primary intent of the currently proposed legislation is to keep telecommunications costs down and to stimulate technological advancement by fostering competition. At the same time, however, this legislation by design or the lack of it, will create a *de facto* information infrastructure and directly impacts the "ecology" of the information environment.

In a symbiotic relationship with this information environment, are the information economy sectors, largely dependent on the telecommunications structure. We are truly an information society, in a transition period between the era of postindustrial/consumption economics, and the age of information and regenerative economics. Fifty percent of the national work effort is tied to the production, use and dissemination of information; almost half of the U.S. gross national product is derived from these efforts.

The exponential growth rate of raw information, and the acceleration of information flow leads to an increasingly more complex society with increasingly larger amounts of "stuff" to cull through to find what you want, and more importantly, what you need. Government and big business have at their disposal technological tools to assist in the culling process; not so, the citizen-user of information.

Already we can see groups of "informationally disenfranchised" citizens—often the economically disadvantaged, minorities, the elderly—whose abilities to utilize the human services delivery systems are limited because they lack the necessary knowledge and basic tools to effectively use these systems. Many communities have information and referral services, often working in conjunction with public libraries, which provide this "life-support" information.

The forthcoming period of austerity and budget tightening will see the collapse of many of these types of services. Can and will libraries pick up the load and provide these services? The information necessary to benefit from tax-supported services, indeed to be a self-reliant member of an information society, is fundamentally different from the commodity information that flows under marketplace forces. The manner in which telecommunications policy affects life-support information must be carefully considered.

Advances in microelectronics and video technology pave the way for a kind of conversational society unprecedented in human history. Not only the home delivery of information goods and services, but home production of information in a highly distributable form. Greater participation in government affairs on the local, state, and national level is imminent, practical, and possible only if made a national priority by those who shape the telecommunication structure and thereby the information infrastructure.

Public broadcasting support is not enough to insure a diversity of ideas and culture, and participation in society's affairs. The age of broadcasting must give way to the age of narrow-casting—specific information for specific needs. The broadcasting industries' desire for source-initiated communications and the citizen-user's need for receiver-initiated communications are at odds, and any telecommunications policy should encourage interaction and debate rather than eliminating it. Ascertainment of the public's needs by broadcasters provides a forum for these discussions.

Libraries are a natural focal point for citizen participation in government in an information age. The same cable systems providing for home delivery of li-

brary services can also provide a means for community dialogues on important issues. National technical standards for cable will insure that the local "electronic town hall" can link with regional and national networks when larger issues arise.

Deregulation of cable could easily lead to patchwork technology virtually short circuiting such democommunications networks. Further, the development of community services is threatened by large cable conglomerates who, when totally deregulated, can swallow local operators who must be responsive to local pressures and needs. By not making community access to cable and community enlightenment via cable the responsibility of the operators, they are free to provide simply television over a wire.

Pure efficiency mindedness can lead to a kind of tunnel vision. The information environment is an ecologically whole system, inseparable from the telecommunications structure. But unlike natural systems, it changes its nature with new technology and shifting policies. The most rapid, broadband, cost-effective telecommunications structure may have damaging social effects in its impact on the information infrastructure—effects, which will be masked from view.

Telecommunications policy has First Amendment implications in that the ability for an individual or group to speak freely *and be heard*, to assemble and discuss issues, and to participate in changes in government are very much a function of the forms of communication available. Citizen communications and information systems must be on a par with those of government and business. Distributing leaflets from a street corner just won't suffice in the information age.

The regulation of the enormous power inherent in telecommunications, for the good of the people and thereby the nation, must be an overriding consideration in any legislative effort.

CHIP SHOOSHAN: I could comment on a number of things, but I think the question you raised about industry structure, that the development of communications industries might in a way preclude some information uses, and will predetermine, if you will, the application of technology, is a very valid point. It is one which, quite frankly, I feel we did not address in the first bill as clearly as we should have. I think that looking at industry structure and recognizing that we can't rely on the antitrust laws to do everything is very important, and I can assure you, it will be an area that we examine in the redrafting of the legislation. That is not to say that some of the other concerns you raised weren't valid and won't be noted either, but I did want to respond on that one point.

Statement of
Brigitte L. Kenney
Solar Energy Research Institute,
Golden, Colorado

Usually, the last speaker doesn't really have anything to say, because everything has already been said, and this is true for me. But, I am delighted to be face to face with Chip Shooshan because I have submitted several sets of testimony to his subcommittee, and I have never met him before. So, if nothing

else, I will get to look at you, and you will get to look at me.

I would like to address Title VII of the proposed Communications Act of 1978. This title provides for the establishment of the National Telecommunications Agency (NTA) in the executive branch of the U.S. government, whose mission would be to:

take such action as may be necessary to provide for the development and implementation of a national telecommunications policy, serve as the principal advisor to the President in matters relating to telecommunications issues and policies . . .

and other issues. The agency would also plan government telecommunications services and systems and would be concerned with matters concerning privacy.

The NTA would presumably replace the present National Telecommunications and Information Administration (NTIA) in the Department of Commerce. It would be an independent agency with a great deal more power than the present one.

My concern is with taking the *I* out of NTIA—that is, information matters would no longer be a concern of the proposed agency.

The history of the NTIA is brief—it was established by President Carter shortly after he took office when the Office of Telecommunications Policy in the White House was abolished. It took some time to acquire the needed staff; there now is a superb group of people, some of the leading experts in telecommunications in the country. The NTIA has recently begun to address information matters under the leadership of Art Bushkin, director of the Information Policy Program who has met with the Legislation Committee of the ALA.

Matters of privacy, freedom of information, information transfer, computer-communications interrelationships—all these are currently being addressed by the NTIA Information Policy Program and other sections of the agency. A draft paper was prepared for the Information Policy Program by me, outlining some of the major information-telecommunications issues with which libraries are presently concerned. The dialogue has only just begun!

While we are all aware of federal funding for libraries (LSCA, HEA, ESEA, NEH, NEA, NSF, and other programs) there has really not been a single focus for information matters in the broadest sense within the federal government. Therefore, librarians greeted the establishment of the NTIA with enthusiasm; perhaps here would be an agency that would consider broad policy issues in context: information transfer and telecommunications have become inextricably intertwined and the time is ripe to consider both together in the formulation of national policies.

The need for such integrated policy-making is evident: it simply makes no sense to direct national efforts toward the development of a telecommunications policy alone. Such a policy merely provides the "skeleton"—information provides the "flesh" to give the system a purpose. Librarians have a deep and abiding interest in an integrated information transfer system which would assure the delivery of information to the remote corners of the country. We believe that no person should be prevented from having the information he or she needs because of geographic or economic considerations. To disseminate information over distance requires a system which would allow a mix of telecommunications technologies, compatible with one another, and able to connect any potential information user to any potential information source, at a reason-

able price. While this is obviously an ideal not soon to be reached, a national effort to develop an information-telecommunications policy could go a long way toward this goal.

It was our hope that such policy development would come from the NTIA; with the elimination of the *I* the new agency would be left to grapple with telecommunications problems alone and we would be right where we were before the NTIA was established.

Libraries do indeed use telecommunications widely; in the future, this use will grow much greater, provided adequate planning is done on the national level to allow implementation of some of the plans we have.

Libraries, 1,500 of them, have installed 2,200 terminals for the exclusive purpose of cataloging books. This means that once a book is cataloged on-line, the information is stored in six Sigma 9 computers and auxiliary hardware in Columbus, Ohio, and this cataloging information is then available to all the other libraries in the network we call OCLC, Inc. Countless others belong to similar on-line cataloging networks elsewhere. There are five major ones now; the number may grow, and these networks are planning to interconnect so that information may be shared to an even greater extent than is possible now.

Several thousand libraries have installed terminals that can access large computer systems to search for bibliographic information, citations to journals, books, legal cases, and the like. There are currently over 100 data bases available with several million citations. To supply the documents which persons receiving the computer-produced bibliographies want, libraries—not many as yet—are experimenting with facsimile and slow-scan video transmission of full-text pages to speed up the document delivery process. Another way technology is used, is to communicate among libraries via TWX requesting needed materials and answers to reference questions.

Another application of communications technology is the remote charging out of books. A library system installs a minicomputer and several dozen terminals, in branches and floors of the main library. Books are checked out and discharged on-line and are, therefore, more quickly available than before when we used manual systems. Reservations for books and other materials, and—yes—the hated overdue notices are produced automatically, making formerly difficult tasks much more efficient.

Cable television is being used to bring community information, book-based programs, and materials produced by local citizens to persons in their homes. On the horizon looms library use of video discs, Teletext, or Viewdata, and similar means of bringing information directly into the home.

These examples only present highlights; it should be clear that with the intensive use of communications and computer technologies in libraries, the attendant problems of privacy, freedom to access information and data, questions of who pays for all this, and many other issues become acute. Thus, we consider it necessary to have a single agency in the federal government that can identify and deal with these problems. For this reason, we strongly recommend that the original purpose of the NTIA be restored.

Let me summarize by saying, we need a forum in the federal government where information can be addressed and adjudicated. We have several large problems that somehow have to be settled. One is the interface between the public and the private sector in the information business. We are at odds quite often, and we need some mediation and some recognition of problems on both

sides. Transborder dataflow is another problem, which goes far beyond libraries, but certainly affects libraries as much as all the other information creators and disseminators. The information policies are being made. It isn't as if we didn't have any, but they are made in a disparate environment by different agencies. No one is coordinating, no one is watching to make sure that the whole thing hangs together, and so we quite often have contrary policies emanating from various branches of the U.S. government and various agencies, even within the branches.

If we take the *I* out of the NTIA, then we have lost the one focal point we do have at the moment, where such matters can be brought together. I like the idea that the new agency will have much more power and will be an independent agency of the executive branch. I don't like the idea that information is no longer a concern. If we do not have a focus within NTIA, where would it lie? Most likely, nowhere at all, and so I would recommend once again, that in the rewrite, the point that I have been making today be considered.

CHIP SHOOSHAN: A very eloquent and good statement. I want to answer your question and also make sure there was no misunderstanding of what I said earlier. We can approach it two ways. I would like to focus on the process involved in putting the *I* into NTIA, because I was involved in that. I want to tell you that that was a very painful process because, just talking sheer politics right now, there was a lot of support for consolidation of the information aspects. And let's be candid about it, we were talking about it as basically in addition to privacy, which you mentioned, and computer policy. That was fought by the Government Operations Committee, by Chairman Jack Brooks, who is very powerful. It was fought and lost at the Office of Management and Budget, when the President was making this decision as an executive order. I don't disagree at all that there is a necessity for bringing together this kind of policy development, but what I am suggesting is, and maybe you don't want to hear pragmatic politics from me today, that battle was fought and lost. There was no support, I emphasize, no support from the Carter administration for making the *I* in NTIA mean anything.

I don't denigrate Art Bushkin in the efforts they are making over there, but if you think that there is a meaningful role for that office over in the Commerce Department, in information policy in the federal government, you are deluding yourself. There is not, and there won't be as long as you have people with the interest, for example, of the Justice Department in the privacy issue, or GSA, the major purchasing agent of the government dealing in computer policy, and every other federal office.

And that gets me back to the point, because I am very sympathetic with the idea of coordinating and consolidating these concerns. One reason we took the *I* out of NTIA in our legislation, apart from these political concerns, was that when you talk about telecommunications and information you are talking about two different things. Telecommunications is a group of technologies for building a delivery system. Information constitutes the goods that are going to be moving over the various technologies. I guarantee you that no one in the federal government wants to give up a piece of the action they have on telecommunication, let alone a piece of the action they have on information. And again, I want to make sure my remarks are interpreted correctly; I am very sympathetic with the needs you indicated, and the needs that were expressed earlier, but I

don't want to see the evolution and development of new communications policies bogged down in a fight over information policy.

Now, let me get back to a point you made earlier when you referred to major issues in information policy. You listed a couple. You listed privacy. There is a clear mandate in the bill for the new NTA to deal with privacy problems. The computer communications interface is dealt with in the legislation by eliminating that interface, preventing the FCC from drawing fine lines and saying—this is communications on the one hand and this is computers on the other, and this should be regulated and this should not be regulated. I think we are going to be even clearer in making that delineation in the new bill. So, again, what I guess I am waiting to hear is some definition of information policy—which doesn't mean re-creating the whole federal establishment and undertaking government reorganization. This is not within the jurisdiction or the intent of our subcommittee. That would be my response.

BRIGITTE KENNEY: I am sure I don't have the answer, because we have been struggling with that one for a long, long time, and we will probably continue to struggle. I guess, in my own opinion, the closest anyone has come to defining what has to amount in this country to a set of policies is in the book of the same title *National Information Policy* or, colloquially called, the Quincy Rogers Report, with which I am sure you are familiar. In this book, sets of issues are identified as privacy, computer communications interface, and ten or eleven others. In one context, and I think this is the first time that had been done, we have about thirty years of studies of policies for a scientific and technical information community that never addressed the needs of the common person. This one is mute on that subject, but says that government policies ought to be considered in ten or twelve different contexts. I think that was a useful first step. I think what I have heard from you this afternoon is loud and clear. Don't you guys waste your time. There has to be another avenue, because this one, if we pull information back in, is going to weigh so heavily the ship might sink. I accept that, but I would like very much to hear your good, sound, pragmatic political advice on what other avenue we might pursue.

CHIP SHOOSHAN: I guess the main, the clearest, most direct response I have to that is that I am not suggesting that it is a battle that isn't worth fighting. I think you could enlist the communications subcommittee in support of the concerns that you and the previous speaker have mentioned about the need for some kind of coherent information policy. What I am saying is, the communication subcommittee of the House Interstate and Foreign Commerce Committee does not have a big enough piece of the action jurisdictionally to deal with this concern. We can put the *I* back in NTIA, but it will be just like the *I* that exists there today.

To give you a good example,—the future of electronic message systems is extremely important, and one which we feel is going to have a big impact on the way information is moved around this country. Henry Geller has spent a lot of time and has written extensively on it. There are a lot of people who are personally committed to opening this market up as wide as possible and seeing what the technology can bring us. There is now a task force within the executive branch looking at the future of electronic message systems in this country. But you want to know who is responsible for that task force? The U.S. Postal Service. What I am telling you is that you can't make decisions in a vacuum and call them information policy without stepping on the toes of literally every

federal agency involved. We have the jurisdiction and the ability in our subcommittee to bring together a cohesive, coherent communications policy but not an information policy.

Now I would be willing to support putting the *I* in NTIA and I think Mr. Van Deerlin would too, as long as we realize the limited nature of what we can accomplish in this legislation. I do think we have to analyze it in terms of the concerns on the part of other committees, other agencies, other federal departments as soon as that concept appears in the legislation.

BRIGITTE KENNEY: Without trying to encourage a debate, I would like to ask you some questions. Are you saying, "Go out and do something about these agencies with vested interests." For example, the House Science and Technology Committee is interested in scientific and technical information. The House Education Committee is interested in lively support of LSCA. Are you saying, "You librarians go out and get these issues brought before the various bodies so that your subcommittee, being a subcommittee only, would get the word from education and science and technology." Is that what you are saying?

CHIP SHOOSHAN: No. Let me tell you what I am saying. Until I see what someone's definition is of information policy, I think it is so diffuse in terms of the federal role that I don't think anyone is going to be able to bring it together. I think what is necessary is to constantly bring to the attention of the other committees and departments, who are engaged in developing information policy, the telecommunications ramifications of their decisions, or the interface between their policy and the benefits telecommunications can bring to them. Again, I can't stress enough—telecommunications should not be, in the federal government or anywhere else, an end in and of itself. It is a mass of technology to deliver services to people, whether in the private sector or the public sector. Information is one of the products being delivered and our doors are open. The Communications Act rewrite might not be the battlefield for addressing all the valid concerns that people have talked about today, but we are supportive, wherever possible, of a coherent government policy. There certainly hasn't been one before in this area.

One final consideration—would the coordinating role that you have just described be sufficient justification for putting the *I* back in? I promise you we will look at this issue again and if we decide to do it, I am going to tell you it is going to take a lot of support, because that issue was fought and lost at OMB in the organization of NTIA. They kept the *I*, but there is not much real clout there to back it up, and coordination without some kind of muscle doesn't really do much, I don't think.

I am really pleased today with the input we have received. I learned a lot from listening to you. I mean that, and I think if some of the testimony we heard during our formal hearings had been as well-focused and articulate as what we heard today, we would have been better off. I mean that sincerely, and I am happy to spend the afternoon with you today. Thank you.

RUTH TIGHE: Chip, we certainly appreciate the time that you have given us this afternoon. We appreciate the effort, and your input, and we are extremely gratified that you have spent this time with us. Thanks again.

This transcript was edited by William D. Mathews with editorial assistance from Heather Nicoll.

Highlights of LITA Board Meetings

The highlights of LITA board meetings are published here to inform division members of the activities of their board. The highlights are not the official minutes of the meetings.

1979 ALA Midwinter Meeting
Washington, D.C.

First Meeting January 8, 1979

The Midwinter meeting of the board was called to order by Sue Martin, president, at 2:00 p.m. The following board members were present: Sue Martin, Mitch Freedman, Barbara Markuson, Ken Bierman, Lynne Bradley, Mary Jane Reed, Lois Kershner, Loreta Tiemann, Donald Hammer, and Bill Mathews. There was a brief discussion concerning the agenda and the sequence of several items was changed. The minutes from the Annual Meeting in Chicago were approved.

FUTURE STRUCTURE OF ALA. The board examined documentation on the future structure of ALA to determine in particular if changes in divisional structure would have any detrimental effect on LITA. A considerable amount of documentation on this subject needed to be examined. After some consideration it was decided to postpone further discussion on this topic until the next session of the board meeting to allow everyone time to prepare themselves fully.

DUPLICATION AND SALE OF INSTITUTE CASSETTES. Don Hammer directed the board's attention to a proposal from George Abbott on behalf of his corporation Information Yield. The proposal offered the services of that corporation to duplicate tape cassettes from LITA institutes. Hammer detailed some of the difficulties inherent in the present duplication process, which is carried out by Hammer himself in his spare time, sometimes working weekends and often at night. The board directed Hammer to pursue the matter and especially to work out more precise performance details such as turn-around time from order to delivery of tapes. Also, it was felt that the nonexclusive nature of the license should be emphasized, that LITA should be clearly identified on the tapes, and that Information Yield should be prevented from using the masters for any other purposes. A resolution was passed

That LITA empower Donald Hammer to make appropriate arrangements

with Information Yield on a nonexclusive basis to duplicate cassettes for LITA, and that the terms and conditions of Information Yield's proposal of December 15, 1978, are acceptable but additional conditions will be introduced as part of Mr. Hammer's arrangements.

LITA AWARDS COMMITTEE. The LITA Awards Committee met, has made recommendations concerning its constitution, and has forwarded a function statement to the Bylaws and Organization Committee. The Awards Committee will become a standing committee of the division. An awardee has been selected and an award will be presented at the upcoming Annual Meeting in Dallas.

AACR II RESOLUTION. Sue Martin reported on the follow-up to the board's resolution on AACR II. After discussion with the ALA president and executive director, the LITA resolution was taken to the ALA Executive Board. They then changed the resolution to explicitly call on LITA, RASD, RTSD, and LAMA to be involved in setting up a mechanism, a timetable, and other details. Since then, at a meeting that included members of LC, ARL, CLR, and many other groups, implementation of AACR II was deferred one year and ALA was asked to establish an AACR II Implementation Studies Committee to gather together existing studies and to identify gaps in those studies that should be addressed. That committee has been constituted and will meet shortly. LITA is well represented on the committee both in quality and quantity. In view of this, it seems that the provisions of the earlier resolution regarding establishment of a mechanism have now been superseded. That is to say, this new mechanism is obviously the one that will carry through the recommendations.

LITA STAFFING. Ruth Frame, associate executive director of ALA, joined the board to give a report on staffing recommendations. Earlier in the fall, a committee of the LITA Executive Board had talked with Bob Wedgeworth and Ruth Frame on present needs for staffing the LITA office. Presently, Don Hammer serves as executive secretary for both the LITA and LAMA divisions. Frame gave a history of the development of LITA and LAMA going back several years. She stated that the combination of secretariats had worked well for quite a while. But now, both LITA and LAMA are expanding their programs, publications, and activities simultaneously. Without additional staff, this has become unsatisfactory. Additional staffing now seems wise, particularly at the program level. After consideration by Wedgeworth, Frame, and Hammer, it has become clear that continuing a joint secretariat is no longer in the interests of either division. A recommendation has gone to LAMA suggesting they explore going to a full-time executive secretary and the feeling is that LITA should do the same. There was further discussion centering around the timing, incorporation of the idea into the budget cycle, and the appropriate coordination with LAMA. Frame indicated that ALA would do everything reasonably possible to make the transition a smooth one.

LITA AFFIRMATION OF THE ALA POLICY ON THE EQUAL RIGHTS AMENDMENT. A statement indicating LITA support for the ALA policy of

holding meetings only in states that have ratified the Equal Rights Amendment was introduced. Discussion touched on the constraints this might bring for future LITA institutes. These constraints were judged tolerable. The following resolution was passed:

That the Library and Information Technology Association (LITA) affirms the ALA policy that no conferences be held in states which have not ratified the Equal Rights Amendment; that no future LITA Institutes, workshops, etc., be held at such sites; and that the Chairperson of the LITA Program Planning Committee be informed of this policy so that the committee can take appropriate action to ensure compliance.

WHITE HOUSE CONFERENCE DIRECTORSHIP. Barbara Markuson outlined her understanding of the present situation regarding staff for the White House Conference. She indicated that a search was underway for a director of the conference and asked the board if a motion could be entertained expressing LITA concern that a qualified person, familiar with problems of the library profession, be sought for this position. The board agreed that such a motion would be in order, and Markuson volunteered to write its text for consideration at the subsequent session.

LITA AUTOMATION BIBLIOGRAPHY. Don Hammer reported that reprints of the "Library Automation Bibliography" from the December issue of *JOLA* have been ordered for distribution directly by the LITA office. It was agreed that this was a good idea and that the availability of such reprints should be included in a small notice in *American Libraries*.

BYLAWS AND ORGANIZATION COMMITTEE. Loreta Tiemann deferred her report until the next session of the board except to ask direction concerning the Membership Committee. After reviewing the history of this committee, the board decided that the Membership Committee should become a standing committee of the division and the following resolution was passed:

That a standing Membership Committee be established to be responsible for recruitment, LITA conference booth, conference hospitality, etc., and that the in-coming Membership Committee chairperson submit a function statement to the Bylaws and Organization Committee for appropriate action.

EXECUTIVE SESSION. The board then went into executive session as announced in the published agenda.

LITA MEMBERSHIP IN AFIPS. A previous action of the board that called for LITA to seek affiliation with AFIPS was reviewed. For some reason, the intent of this resolution was not conveyed through proper channels to ALA administration. It was agreed that the idea would once again be pursued.

PROPOSED DISCUSSION GROUPS. The board considered the idea of forming discussion groups for automated authority files, bibliographic control, and networks. A Network Discussion Group is also under consideration by ISAS. Since the bylaws are specific on this point, it was decided that interested

parties would be advised that discussion groups can be formed once ten or more members sign a petition.

The meeting was then adjourned.

Second Meeting

January 10, 1979

The meeting was called to order by Sue Martin, president, at 2:00 p.m. The following board members were present: Sue Martin, Mitch Freedman, Barbara Markuson, Ken Bierman, Lynne Bradley, Ron Sigler, Mary Jane Reed, Lois Kershner, Jerome Miller, Loreta Tiemann, Donald Hammer, and Bill Mathews. Martin called for reports from committees.

EDITORIAL BOARD. Bill Mathews reported that the Editorial Board has decided to make a number of changes to the journal to make it a more attractive and understandable package. There would also be an effort to solicit articles as part of a plan to make the contents more relevant. Mathews also presented a written proposal to the board, outlining the details of a divisional newsletter. Such a newsletter would highlight LITA events and focus on activities at each ALA conference but would also contain news of a more general nature, short items of interest to all members and sections of LITA. After this presentation, it was resolved

That LITA establish a division newsletter on a continuing basis for at least one year, and approve a first-year budget of \$3,200 in accord with the terms and conditions of the proposal dated January 9, 1979.

A search for a newsletter editor will commence immediately, with the hope that an edition of the newsletter might be ready before the Dallas Conference.

FUTURE STRUCTURE. Discussion of the documentation relating to the future structure of ALA was resumed. The discussion centered around "regional" aspects and the question of joint memberships. However, it was concluded that nothing in the documentation required any action of the board.

PUBLICATION OF INSTITUTE PROCEEDINGS. During the course of the board meeting and interspersed between other items of business, the board heard presentations from three publishers: Knowledge Industries, K. G. Saur, and Oryx Press. The representatives from these publishers all indicated their interest in publishing the proceedings of LITA institutes. It was determined that a "Request for Proposal" would be formulated and sent to these three publishers and possibly others. The responses would then be screened and a recommendation would be made to the board as to which publisher's proposal had the most merit for LITA's concerns.

PROGRAM PLANNING COMMITTEE. Bonnie Juergens described two LITA institutes under consideration by the Program Planning Committee. The first is a 2½-day Institute on Automated Authority Control, to be held in the middle of May and again in September. Tentative locations are Atlantic City and Denver. The first half-day of this would be introductory material. The sec-

and institute would be a two-day program on Automated Acquisitions. This would be held in late November 1979 and again in the middle of March 1980. Locations for these would be Nashville and Seattle. In addition, two programs have been planned for Dallas. One of these would be on holography because of the good response to this topic at a recent institute. Relating to this program it was resolved

That up to \$400 be made available to support the holography program during the Dallas Conference.

The other program would be part of the membership and business meeting of LITA and would include a panel of experts responding to questions using the Delphi technique. Many of the questions would be prepared in advance and would pertain to a wide range of topics such as technology, planning, funding, etc. But the panel would also be open to questions from the floor, so the program would elicit audience participation.

Juergens pointed out that the role of the Program Planning Committee is changing due to the fact that there are now sectional Program Planning Committees. There could be potential conflict between the divisional Program Planning Committee and the sectional ones if their relationships are not carefully clarified. After some discussion of the nature of these conflicts and some observation of apparent overlaps in authority, the board resolved

That an Ad Hoc Committee be established which would include the chair of each section's Program Planning Committee, the present and to-be-designated chairs of the divisional Program Planning Committee, and the chair of the Bylaws and Organization Committee who will serve as the chair of this committee; and this Ad Hoc Committee will have as its function the recommendation to LITA Board the appropriate relationships, responsibilities, and function statements of the various Program Planning Committees with respect to each other. It is urged that this Committee report to the Board at its last meeting in Dallas.

INFORMATION SCIENCE AND AUTOMATION SECTION (ISAS). Lois Kershner reported on the first meeting of the ISAS Executive Committee. The meeting was mostly immersed in organizational details. A Nominating Committee and a Program Planning Committee have been formed. The Industry Relations Committee is establishing its charter. TESLA is working on a character set survey and a bibliography on display devices.

WAYNE STATE UNIVERSITY EXPENSES. George Abbott and Don Hammer discussed a bill relating to a satellite link for a LITA institute at Wayne State University earlier in the year. Expenses were incurred even though the LITA institute was held at the nearby University of Michigan instead. Wayne State employees were on strike, and the campus was closed. It was determined that, rather than pay the bill, Don Hammer should write a letter to the president of Wayne State fully informing him of the conditions that obtained.

INTERNATIONAL FEDERATION OF LIBRARY ASSOCIATIONS (IFLA). Mike Malinconico reported on IFLA activities, especially relating to the mechanization section. After reviewing details of work on international authorities, Malinconico suggested that LITA become more involved and influ-

ential in standard-making activities at the international level. Perhaps LITA could apply for a J. Morris Jones Award to explore how its participation could be enhanced. After some further discussion, it was resolved

That LITA establish an Ad Hoc International Mechanization Consultation Committee for the purpose of exploring the problem of international standardization and cooperation regarding mechanization and related activities so that LITA is more visible, and LITA's needs and representation at international meetings and in international standardization activities be secured, if deemed appropriate by the committee. The committee should make recommendations as to its structure, functions, and future activities by no later than the last board meeting of the 1980 annual meeting in New York City.

This motion does not preclude that the committee might be interdivisional, and it was understood that such a group would probably explore working with RTSD.

MARBI COMMITTEE. Mike Malinconico further reported on progress of the MARBI Committee. MARBI has a large number of proposals before it and is working on its ground rules to insure open participation. Given the heavy work load, it may be necessary to meet between meetings of ALA. There may be some need of travel funds, though it was too soon to tell.

NOMINATING COMMITTEE. Charles Husbands observed that there were some ambiguities regarding the constitution of the Nominating Committee as outlined in the LITA manual. Depending on which statements were accurate, the committee either consists of three or six persons. Its reporting requirements are also unclear. Notwithstanding, everything is well in hand to submit names for the deadline in February.

TELECOMMUNICATIONS COMMITTEE. Steve Silberstein reported on plans to sponsor a program at Dallas in cooperation with MARS. The program would consider telecommunications in libraries as related to the provision of reference services. Three speakers are expected: one to describe the kinds of telecommunications services available today, another to talk about the dynamics of the telecommunications industry, and a third to discuss future telecommunications technologies. The committee has also established a subcommittee to study telecommunications in more detail. This subcommittee would inform itself on present and potential uses and be cognizant of legislative and technical aspects of telecommunications so as to become a resource on which LITA could draw for advice. To support this activity, the board resolved

That the Telecommunications Committee be authorized to expend up to \$250 in support of telecommunications information and data-gathering activities.

AUDIO-VISUAL SECTION (AVS). Ron Sigler indicated that AVS intends to cosponsor a program with VCCS that would explore problems relating to conversion from video to film and vice versa. He also spoke about the fragmentation of audiovisual concerns. It seems that more than forty different groups within ALA have some interest in this topic. Responding to questions from

Mitch Freedman, Sigler assured the board that AVS would move forward with new vitality under his leadership.

EDUCATION COMMITTEE. B. Kenney submitted a written report to the board. She briefly asked if it would not be proper for the Education Committee to be involved in evaluating LITA institutes. While this might not be needed right at the moment, it could be useful if the function statement included such a provision.

VIDEO AND CABLE COMMUNICATIONS SECTION (VCCS). Lynne Bradley stated that the VCCS publication "Guidelines for Video and Cable Communication" was being revised chapter by chapter, and a new edition would soon be ready. She stated that an informal network of contacts was successfully expanding through VCCS. She also indicated that VCCS was interested in doing some preliminary planning and study for a possible videotape exchange. The exchange itself would not be operated by VCCS but perhaps by a public broadcaster. VCCS, however, was interested in participating at the planning stages.

JOINT COMMITTEE ON EDUCATIONAL TELECOMMUNICATIONS (JCET). Lynne Bradley described the many interests in which JCET now finds itself immersed. Among these were the Communications Act rewrite, the World Administrative Radio Conference, public television financing, off-air recording, and the Public Service Satellite Corporation Act.

LITA LEGISLATION COMMITTEE. Ruth Tighe described the very successful open hearing on the Communications Act the committee had just sponsored. She emphasized the committee intent to study the full range of regulatory and legislative issues relating to LITA interests. Regarding this, she presented a proposal to the board to identify these issues more thoroughly for the committee's purposes. The proposal outlined a study that would be conducted during the spring at a cost of \$1,700. The board resolved

That the LITA Legislation Committee be budgeted up to \$1,700 to compile an annotated list of existing federal legislation or regulations in areas of interest to LITA.

ALA AD HOC COPYRIGHT COMMITTEE. Jerome Miller informed the board that there will be hearings during the upcoming session of Congress before the House Judiciary Committee relating to the very important topic of voluntary guidelines for fair use as it relates to off-air copying. He stated that the Judiciary Committee would probably provide travel funds but asked the board to approve contingency funds so that testimony could be provided on this very important issue. Accordingly, the board resolved

That LITA spend up to \$800 to pay for Jerome Miller's expenses to represent LITA at the hearings and meetings.

LITA BUDGET. Don Hammer reviewed the budget, including the amounts committed during the present meeting of the board. It was clear that the divi-

sion was in sound fiscal condition, due in no small part to the very successful series of institutes in the past few years.

BYLAWS AND ORGANIZATION COMMITTEE. Loretta Tiemann submitted a written report that included adoption of new function statements for several LITA committees. She asked for advice concerning the earlier point relating to a possible role for the Education Committee in reviewing LITA institutes. Sue Martin stated that she would be willing to draft something to clarify this relationship.

WHITE HOUSE CONFERENCE STAFFING. Barbara Markuson then introduced the resolution she had drafted following the previous day's discussion. The board resolved that:

Whereas the White House Conference on Library and Information Systems is an event of singular importance to the users and providers of library services and whereas the final program plans must be accomplished rapidly, LITA strongly recommends that NCLIS appoint a recognized leader in the library field as Director of the White House Conference and that the President of LITA take appropriate action to convey the sense of this resolution to appropriate organizations.

The meeting was adjourned.

Communications

Processing OCLC MARC Subscription Tapes at Yale University

Robert P. HOLLEY and Dale FLECKER:
Yale University.

During the past eighteen months, the Yale University Library has acquired significant experience in processing the OCLC MARC Subscription Service tapes, commonly known as the archive tapes. This paper will review a number of problem areas that we have identified. While the Subscription Service does provide each library with a computer tape that includes all the library's machine-readable cataloging, it is important to realize that the service does not automatically provide a ready-to-use machine-readable catalog. There are at least two major reasons for this. First, each time anyone used the "update" or "produce" keys at an OCLC terminal,* a discrete record is written onto the archive tape. Therefore, duplicate archive records may exist for the same bibliographic holding. Second, a machine-readable record that produces an accept-

able set of catalog cards is not necessarily an acceptable record for the production of other outputs, because procedures established with cards in mind may not take into account the needs of other formats. A library may choose to create an incorrect machine-readable record in order to override some automatic feature of the OCLC system.

THE EDITING PROJECT

Our purpose in processing archive tapes is to produce a cumulative master file in which each item cataloged is represented by only one record with correct location information and with acceptable cataloging. We determined that any simple record selection procedure, such as keeping the latest record with the same OCLC record number, would not produce the desired result. Therefore, we use a commercial software package to identify all duplicate occurrences of the same OCLC record number. At four-week intervals, we receive a Subscription Service tape from OCLC and merge the records into our master file. At this point, all new duplicate occurrences are printed out in the full MARC format. The computer printout is edited. Any changes are then made to the master file by using standard punched cards and the commercial software package's editing conventions.

One of the principal requirements in establishing the project was simplicity of operation. While the software package we use includes the ability to correct individual records, this type of decision making would require a highly trained editor. Instead, we stipulated that the only allowable decision was to keep or to delete the entire record in question. If an error was serious enough to justify either ordering a new set of catalog cards or correcting a Yale input record, then an amended ar-

*Five transaction types, initiated by depressing the "update" or "produce" keys with further procedures as required, write records onto the OCLC archive tapes. The five types, each identified within the resulting record, are defined as follows: "Update" adds the library's holding symbol to an existing record or adds a new record to the OCLC data base with the library's symbol; "Produce" orders a set of catalog cards in addition to the results of an "update"; "All Produce" is the same as "produce" except that it allows the ordering of catalog cards for multiple locations with the same transaction; "Cancel" removes the library's holding symbol from a record without affecting the base record; "Replace" changes information in the OCLC data base for an "unlocked" record.

chive tape record was produced through OCLC. If an error did not justify correction in the card file, then the existing archive tape record was not amended.

THE NOTATION SYSTEM

To assure that the editor faces only relatively simple decisions, an OCLC terminal operation who creates a duplicate record is given the responsibility for explaining the duplicate. This explanation is contained in a set of prescribed notations that are added to the local option field (tag 910) whenever a Yale holding symbol already appears on the record retrieved from the OCLC data base. These notations are entered at least twenty-one spaces into the body of the field so that they do not print at the bottom of the catalog card. In order to build the future capability for computer processing, each note is preceded by a #a. The editor thus has all the necessary facts at hand when making decisions on the duplicates and is not forced to consult other files.

We have grouped the notations into four categories according to the reason for the duplicate record: (1) location considerations, (2) card production requirements, (3) OCLC input standards, (4) other. These notations have been adequate to meet Yale's editing needs. Several are required to solve strictly local processing problems, but many would apply in most libraries.

Duplicate records for different locations occur because Yale has found it impractical to build detailed holdings (the 049 field) into each record as suggested by OCLC. To do so, we would need to control location information for approximately thirty-five libraries or special collections. The notation "ad loc" in the 910 field signifies that the record is for an additional copy of a book previously cataloged for another Yale location. All added copy records are kept in the master file with record collapsing as a future problem.

The location of cataloged items can also change. "Trans from XXXX" indicates that the record is for the transfer of a book from collection XXXX (where XXXX indicates the four-letter symbol of a Yale holding library). The editor deletes all previous

records for XXXX library and keeps the "trans from" record as the current location of the item.

"Withdraw XXXX" signifies to the editor that this book has been withdrawn from collection XXXX or that the book in question is now cataloged using a different OCLC record. If there is a previous record for the XXXX location, both that record and the "withdraw" record are deleted. Otherwise, the "withdraw" record is kept, since it refers to a record that was processed before the beginning date of the project. The transaction containing the "withdraw" note can either be a "cancel" or an "update." The "cancel" indicates that the last copy of the item has been withdrawn from the Yale library system and that the Yale holding symbol should no longer appear on the OCLC data base record. An "update" is necessary when other copies remain at Yale; in this case, the OCLC transaction could have been omitted, except for the requirements of editing the archive master file.

Duplicate records for card production subdivide into two types. The more common is any change required to maintain the integrity of the card catalogs. "Corr" indicates correction of an error in a previous record. As stated previously, these corrections should be of a major locational or bibliographic nature. The corrected record is kept and the previous record discarded. "Ad vol" tells the editor that additions have been made to the contents of a multivolume set. The earlier, less complete, record is deleted.

Other duplicate records for card production are tied to the functioning of the OCLC system. "Xcad" identifies a record that was used to order extra cards for a previously cataloged work by means of the OCLC extra card function. Since extra card records cannot be distinguished on the archive tape from full "produce" records, this special notation was required to avoid potential confusion. The editor deletes the duplicate record with the "xcad" notation.

A more disquieting case for future use of the archive tapes is the deliberate creation of an incorrect machine-readable record in order to obtain correct catalog

cards. At Yale, our OCLC card production profile does not always correctly interpret our oversize designation for locally formatted call numbers (099). To obtain usable catalog cards, we add the record to the OCLC data base with an "update" transaction and then recall the record. The #c is removed from the size subfield of the collation (300 field) to avoid triggering the automatic oversize designation. The oversize is then explicitly added to the local call number field by the operator, and catalog cards are ordered by a "produce." "Size" indicates this procedure and flags a future programming problem for any use of the file. Other libraries will need to identify similar cases where card production requirements have taken precedence over accuracy in the machine-readable record.

OCLC standards for input cataloging create another class of duplicates. As members, we are obligated to follow OCLC rules that require, with a few stated exceptions, exact transcription of Library of Congress cataloging copy. For those cases where Yale authority varies from the LC card, we input the card into the OCLC data base according to OCLC standards before modifying the record for card production. Furthermore, though OCLC does not demand strict compliance with LC authority for original cataloging, we input place-name subject headings with indirect subdivision, according to LC standards, before changing most headings to direct subdivision for card production. In the archive tape notation, "lc" designates the exact transcription of LC cataloging copy; "orig" shows the closer adherence to Library of Congress policy for original cataloging; and "Yale" identifies the modified version of the previously input record for card production. Since we hope to use any outputs from our master file after a changeover to closer compliance with LC practice, we keep the "lc" and "orig" records and delete the "Yale" occurrences. Here again, each library will need to decide which record best meets its future requirements from the various duplicates on the archive file.

We also encounter cases where bibliographic variations are so slight, e.g., hardcover and paperback editions, that we

do not feel justified in creating a new record in the OCLC data base. Instead, we reuse the record of an already cataloged edition. "Diff edition" identifies these instances. Both records are kept because they represent separate holdings with different call members.

The final three notations cannot be categorized. "Test" tells the editor that the record was used to test some feature of the OCLC system and should be deleted. "Keep" signifies that the record should not be deleted; "other" provides for circumstances that are not covered by any other note. Explanatory text should accompany the latter two notations.

PROBLEMS

Unfortunately, even a good notation system cannot resolve certain difficulties with the OCLC MARC Subscription Service. First, the records do not contain the date of the transaction. Care must be taken that the archive tapes are processed in the correct order or valuable chronological information for editing will be lost. At times, the cataloging date would also be useful to help resolve problems in the card files when the editing has discovered undetected errors. Once records are in a master file, the lack of a cataloging date could affect any attempt to generate outputs, since even with excellent documentation it would be impossible to know what policies were in effect, both in the library and at OCLC, when the archive record was created.

OCLC's efforts to eliminate duplicate records for the same bibliographic item cause another problem. At present, when the duplicate record is removed, OCLC transfers the library's holding symbol to another record with a different OCLC number. OCLC neither writes a record onto the archive tape nor notifies the library of the change. Any program based upon duplicate occurrences of the same OCLC number will be unable to match uses of the same bibliographic item before and after the elimination of the duplicate, since the records will have different OCLC numbers in the master file. Neither will the terminal operator be aware of the problem, since the library's

holding symbol will appear on the OCLC data base record even though no such record exists in the master file. Therefore, superseded "ghost" records may remain with no simple method for removing them from the file. At present, we have no measure of the size of this problem.

Since the OCLC MARC Subscription Service has provided records only since February 1977, we have also encountered difficulties from not having a complete file of our machine-readable cataloging. Current transactions may affect items that are not in our master file. If OCLC is not successful in providing our complete archive tapes, we will need to purge the file of all "withdraw" transactions that were left in it for the time when the older records would be added.

A final problem occurs with "replace" transactions, since they do not write a full record onto the archive tape. Though present on the CRT screen, local fields, such as holding library, local call number, and local notes, do not appear in the "replace" record on the archive tapes. Because of this, the most stressed rule in inputting has become that "every 'replace' transaction must be followed by an 'update' or 'produce' " in order to guarantee a usable complete record.

We have not yet tried to produce products from the edited file. Any such project will have to deal with a mixture of records that reflect different states of the OCLC system. In its seven years of operation, OCLC has changed its internal formats, e.g., the use of fill characters, the treatment of local notes, etc., and any processing must take account of the changes. Yale will also have to devote a significant amount of effort to call number expansion, because we have made heavy use of the automatic features of the OCLC card production program. Location stamps, both above and below the call number, as well as oversize designations do not always explicitly appear in our archive tapes, even though they are added to the catalog cards by the OCLC card production program. Before presenting any product to the public, we will need to duplicate these segments of the OCLC program in order to provide a usable call number.

CONCLUSIONS

Even with a limited editing project, Yale has encountered several difficulties in processing OCLC MARC Subscription tapes. Multiple occurrences of the same OCLC record for many different reasons led us to develop a system of notations for human editing of our archive tapes. Special procedures, developed to achieve certain goals in our card catalogs, often complicate the selection of usable records from the archive file. Certain features of the OCLC system may also hinder the easy use of the records for other purposes. In our complex library environment, simple criteria for record selection, such as keeping the latest record, would not work. We would recommend that each library study its operations carefully before using its archive tape for any printed or microform outputs. Without such study, a simple algorithm for record selection could very well produce a garbled, useless product.

Processing OCLC MARC Subscription Tapes at North Carolina State University

William C. HORNER: D. H. Hill Library,
North Carolina State University.

The D. H. Hill Library at North Carolina State University is a charter member of the Southeastern Library Network and began using the OCLC shared catalog system in June 1975. The library considers the OCLC system to be valuable for several reasons and the most important of these is the facility and economy provided by OCLC for the creation of a local machine-readable data base of MARC records. The library uses OCLC for current cataloging and retrospective shelflist conversion of both monographic and serials records. The local machine-readable data base is created from OCLC archive tapes that the library has been receiving since June 1975.

The library began the creation of a local machine-readable data base in 1972 using

library-written programs running under IBM's Time Sharing Option interactive system (TSO) on the Triangle Universities Computation Center's (TUCC) IBM S/370, model 165, and using the Library of Congress' weekly MARC distribution service. The limitations of TSO and of the peripheral hardware available on the TUCC computer made this a cumbersome system to operate. Nevertheless, from mid-1972 until June 1975 approximately 45,000 usable records were converted both from current cataloging and retrospective shelflist conversion, including all North Carolina State University theses and dissertations. The rationale for this effort is our conviction that most, if not all, foreseeable library automation projects will use our MARC bibliographic data base in whole or in part.

The tasks of creating current and converting retrospective records have been made both easier and more economical by our use of OCLC. From June 1975 to July 1978, about 135,000 records were created through OCLC. The cost of retrospective conversion (for which no cards are produced and no first-time-use charges assessed) is less than fifty cents a record.

Our local data base is updated from OCLC archive tapes, which we receive at four-week intervals. The considerable processing required to make the data on these tapes useful both for maintaining our data base and for providing some ancillary services we will now describe.

A "raw" archive tape is a time-sequential list of OCLC records "used" by the library through the "produce," "update," "all produce," "replace," or "cancel update" functions. That is, every time the library processes an OCLC record at an OCLC terminal using one of these functions, an archive tape record is created. If the same record is processed twenty times during one four-week period, it will appear twenty times on the archive tape. Furthermore, the archive tape records come to us in extended American Standard Code for Information Interchange (ASCII), which is a computer code that cannot be processed by our IBM computer, which uses Extended Binary Coded Decimal Interchange Code (EBCDIC).

Also, the record is in MARC "communications" format while we prefer to use MARC "processing" format in our master bibliographic data base. Our first task, then, is to convert the "raw" archive tape to a file of usable ordered records by translating the ASCII code to EBCDIC, reformatting the records from "communications" to "processing" format and eliminating unwanted duplicate records.

For convenience we break down the total archive tape processing task into four "jobs," which are run in sequence using a "hold-release" mechanism available at TUCC. If the first job runs successfully, it releases the second, which, if it runs successfully, releases the third and fourth. If any "job" fails to run successfully, it will not release the subsequent "job(s)" to run.

The first job consists of a single program that, using appropriate translation tables, translates the ASCII characters to EBCDIC and converts the record format from "communications" to "processing."

Having converted the "raw" archive tape records into a computer code usable in our hardware and into a format consistent with our programs, we next eliminate the unwanted duplicate occurrences of the same record. The method we use has two preconditions. First, the archive tapes must indeed be time-sequential, i.e., the records must occur on the archive tapes in exactly the order in which they were processed so that, if we assign a sequence number "1" to the first record, "2" to the second record, etc., then, in the case where the library has processed the same record more than once during a processing period, the last use of that record will have the highest sequence number. The second condition requires that the Cataloging Department makes the last processing of the record the "valid" processing and that the record so processed is complete—in particular, the "049" tag, which contains the library's holdings for monographs, must be complete. OCLC prepares the archive tapes so as to satisfy the first condition, and our Monographic Cataloging Department processes records so as to satisfy the second.

The second "job" in our processing sequence uses six required program steps to

eliminate unwanted duplicate occurrences of the same record in the following manner. First in "step 1" one twenty-two-character record is created for each OCLC record on the archive tape. These twenty-two-character records contain the sequence number, OCLC number, holding library code for the first "a" subfield of the "049" tag, and an indicator to distinguish between serials and nonserials. (The holding library code field is set to blanks for nonserials.) The file created in "step 1" is then sorted on sequence number within holding library code within OCLC number in "step 2." In "step 3" consecutive pairs of records are compared and, if the OCLC numbers are equal, the record with the lower sequence number is eliminated. If the same record occurs more than twice, successive comparisons eliminate all but the record with the highest sequence number.

An exception to this general rule is applied to serials. The Serials Cataloging Department enters only the holding library code in the "049" tag (i.e., only the "a" subfield) and enters only one holding library code in each use of a record. For serials, therefore, it may be "legal" to have more than one occurrence of the same OCLC record. As a consequence, for serials "step 3" compares the holding library codes as well as the OCLC numbers. Both holding library codes and OCLC numbers must be equal for the record with the lower sequence number to be eliminated. "Step 4" sorts on sequence number. "Step 5" uses as input both the output of "step 4" and the reformatted archive tape output of "job 1." Only those OCLC records whose sequence in the archive tape output of "job 1" matches the sequence number of the records output in "step 4" are output. "Step 6" sorts the "clean" archive tape on OCLC number. This last "step" of "job 2" releases both "job 3" and "job 4," provided that "job 2" has run successfully.

"Job 3" is a four-step job that uses the output of "job 2" as input to produce eight different acquisitions lists of monographs, classified by general subject category using the LC class number, and an unclassified list of new serial titles. "Step 1" creates a

file of MARC records with a call number sort key prefixed to each record. "Step 2" sorts the output of "step 1" by call number, and "step 3" strips the call number sort key from the records. "Step 4" selects the list(s) in which each title is printed—some titles may appear in more than one list. The format of the lists and the definitions of the class categories were determined by the department heads after considerable discussion. The lists are photocopied and sent to the appropriate academic departments.

There are two versions of "job 4," whose primary function is to produce and maintain a usable MARC data base of the library's bibliographic records. The original version maintained a sequential file (in order by OCLC number) on magnetic tape. This version has a single step that (using external subroutines) uses the "clean" archive tape produced in "job 2" and the current master file as input and, by comparing the OCLC numbers of the archive tape and the master file and interpreting the OCLC transaction code ("produce," "update," "all produce," "replace," or "cancel"), outputs a new master file that incorporates the records in the archive. By decoding and, where applicable, comparing "049" tags, the program also generates cataloging statistics and reports of cataloging activity. These reports give a breakdown of titles added, volumes added, copies added, titles withdrawn, volumes withdrawn for various collections (main, reference, undergraduate, special, design, textile, forestry, and Curriculum Materials Center), totals for the four-week period, cumulations for year to date, and total library holdings. A supplementary report gives a count of shelflist conversions, analytics, government documents, and first-time-use charges.

There are problems, however, both in maintaining and using very large data bases stored as sequential tape files. In processing the tapes, we have been subjected to tape drive malfunctions, worn and dirty tapes, computer operator errors, etc. We have used the tapes to produce selected subject bibliographies using a key-phrase search of both subject and title tags. The searches (and bibliographies)

have been highly successful, but it is inefficient and costly to perform these searches on a sequential tape file.

We have, therefore, installed a new "job 4" that maintains a direct-access master file keyed on OCLC number on magnetic disk. This job requires three steps and, in addition to performing all the functions of the old version, generates the item status records to be used in our circulation system, a call number index to the master bibliographic file, and an error report. The error reporting system "flags" records with errors in the master file but does not delete them. When the records are corrected, the error flags are removed. The four-week error report prints the records with error flags in the same format as the screen display on an OCLC terminal. The use of direct-access disk storage eliminates the problem of worn and dirty tapes and most of the hardware malfunctions and operator errors.

The use of direct-access disk storage also permits us to develop subject indexes that will make the generation of subject bibliographies from the data base economical. We can now generate an index of LC subject headings, but we feel that this approach is inadequate and does not make full use of the search capabilities of our direct-access data base. We are presently working on algorithms to permit searching for key phrases in both subject and title tags. Essentially the problem is to optimize the large storage requirements of an index that contains all possible subject key phrases and the computer processing time required to do a key phrase search in each of a smaller number of subject and title indexes.

At present our direct-access data base is stored off-line; but, ultimately, we expect to put the data base on-line and use it for the operation of a full-service, computer-based catalog.

Our OCLC archive tape processing thus converts the "raw" data returned on the four-week OCLC archive tape into an OCLC-number-keyed direct-access master file and the basic records for our on-line circulation system. By-products of the processing include classified acquisitions lists and new serials list, statistical reports of

cataloging activity, and error reports. The system has the capability of generating indexes for any MARC record data that will be useful to the library patrons or staff and provides an economical means for generating special bibliographies—particularly by subject.

A Study of Data Elements for the COM Catalog

Steven Seokho CHWE: School of Library Science, University of Southern California.

PROBLEM

In converting the traditional card catalog to a COM catalog at the University of Southern California School of Library Science Library, one of the questions raised was which data elements should appear in the entry. The fewer elements included in the COM catalog, presumably the more economical it becomes for production, maintenance, and possibly for efficiency in use. As the future of the card catalog is increasingly questioned, information elements contained in catalog cards are also challenged as to their usefulness. What is the function of a catalog? What information is sought in a catalog by a patron? What is the justification for including all elements found in the traditional catalog card in a new form of catalog? The exclusion of unnecessary elements in the COM catalog should save a significant part of the time and labor involved in data conversion, not only in the initial stage but also in the long run.

The first problem, then, is to identify the essential and nonessential catalog data elements. The next question is that of users' reaction toward the sudden change in both the form and content of the catalog. The USC's decision for this pilot project was to isolate the issue of data elements from the new form of catalog, COM. So, for the first stage, all the traditional data elements have been included in the COM catalog. However, for the next stage of experiment, the essential data elements need to be determined. The purpose of the study, therefore, was to identify the

essential catalog data elements as viewed by catalog users.

QUESTIONNAIRE

A subcommittee was formed within the COM Catalog Project Committee at the School of Library Science. The subcommittee was composed of three faculty members who teach cataloging. They devised a questionnaire as a survey tool to determine those data elements considered essential and nonessential by the general users. The final questionnaire, approved by the parent committee, was administered to students in three library science courses: Introductory Cataloging and Classification, Advanced Cataloging and Classification, and Introduction to Librarianship.

The questionnaire was accompanied by a sample catalog card entry, with specified names for each data element designed to assist respondents not familiar with the phrases used in the questionnaire. The traditional and typical elements of a catalog entry were included:

1. Heading: author's name
2. Title proper
3. Statement of authorship
4. Edition statement
5. Imprint statement (as a unit)
6. Place of publication
7. Publisher
8. Date of publication
9. Collation
10. Series statement
11. Notes
12. ISBN
13. Tracing

Each of these data elements was to be rated on a scale of 1 to 5 (1, absolutely essential; 2, very useful; 3, useful; 4, of little use; 5, of no use). The thirteen elements might be considered crude, as more detailed subelements could be named, such as the types of titles, the varying collations, and the many different notes. However, it was felt that the further breakdown might confuse the respondents. Space was provided for respondents to list other elements that they considered important. The last five questions regarding cataloging course background were added to determine whether there were any cor-

relations between the pattern of responses and respondents' knowledge in cataloging.

ANALYSIS OF DATA

These data on cataloging course background were gathered to observe any possible correlation between the course background and the answering pattern on each element being tested. The Pearson Product Moment correlation was attempted for the relationship. However, no meaningful interpretation could be derived from the result, and it appeared no relationship or very little relationship existed.

Table 1 shows thirteen data elements in the order of score ranking (importance) by mean scores as perceived by catalog users. The heading and the title of a catalog entry were both considered the most important elements. It is reassuring that users still want the author's name to appear as heading, although the same statement of authorship may appear in the body of the entry. In fact, the author statement in the body of the entry ranked seventh out of thirteen elements.

The title is regarded as no less important than the heading (author's name). It is obvious that the title plays the key function in a bibliographic search. Catalog users also consider the date of publication very important.

Elements follow in order: edition statement, imprint (as one unit), tracing, publisher, statement of authorship (in the

Table 1. Catalog Entry Elements in the Order of Importance by Mean Score

Rank	Elements	Mean Score (n=83)
1	Heading (author's name)	1.108
(Tie)	Title	1.108
2	Date of Publication	1.675
3	Edition Statement	1.964
4	Imprint (as one unit)	2.181
5	Tracing	2.262
6	Publisher	2.609
7	Author Statement (in the body of entry)	2.614
8	Notes	2.771
9	Place of Publication	2.804
10	Collation	3.120
11	Series Statement	3.121
12	ISBN	3.506

body of entry), notes, place of publication, the publisher, and the date. It was separately treated as one representing the three elements as a validity check as well as for restricted choice for respondents.

As shown in the table, no element scored beyond "4, of little use." But it is noticeable that three elements, collation, series statement, and ISBN, scored beyond "3, useful." In fact, these three elements have very little practical use for ordinary catalog users. Catalogers have assumed that such information as pagination and illustration might be useful for the patron. Some other elements, such as size and ISBN are included for librarians, not necessarily for patrons. It is clear that a patron is unlikely to look for an ISBN in a catalog. The question to be raised is whether to include such "for-librarians-only" information in the public catalog entry, which is crowded with various items. When the form of catalog is to be changed from the print form to a machine-readable form, the question becomes more serious from the economic standpoint. When a bibliographic record contains fewer characters to store in a machine-readable form, the question becomes more serious from the economic standpoint. When a bibliographic record contains fewer characters to store in a machine-readable form, such as COM or disk, the unit cost per record will be considerably less. Before making decisions based purely on economic considerations, however, it is necessary to determine whether the elements that are less likely to be searched by the general public are indeed valuable and actually used by librarians. If they are used, the significant level of usage should be proved to justify their inclusion. No study has been attempted to identify the librarians' habits of catalog usage. Many catalog elements have been included simply because it is "nice" to have such information and "just in case."

Elements such as publisher, author statement in the body of entry, notes, and place of publication showed only moderate levels of importance to users in a catalog entry. They all scored beyond 2.5. Table 2 depicts the rankings of the same data elements by a different score criterion—the

Table 2. *Catalog Entry Elements in the Order of Importance by Cumulative Positive Percentage Score*

Rank	Elements	Percent Cumulative 1-3
1	Heading (author's name)	98.8
(Tie)	Title	98.8
2	Date of Publication	96.4
3	Edition Statement	95.2
4	Imprint (as one unit)	86.7
5	Publisher	83.1
6	Notes	81.9
7	Tracing	75.9
8	Author Statement (in the body)	69.9
9	Place of Publication	68.7
10	Collation	61.4
11	Series Statement	59.0
12	ISBN	44.6

cumulative percentage of scores 1 through 3, that is, the total percentage of all respondents who gave a score of either 1, 2, or 3 for each item. Since the scores up to 3 represent positive answers, it was thought that the combined scores (cumulative percentages) of only these positive responses might generate different a set of rankings.

It is interesting to note that, except for four elements grouped in the middle of the table 1 ranking, all elements are ranked the same as in the rankings by the mean scores. As shown in table 2, those four elements are: publisher, notes, tracing, and author statement. However, the differences in the rankings of these four items do not seem to present any significance in themselves, because they represent only minor transpositions; the items have not changed their rankings as a group from the mean score rankings.

Under category 15, "Other elements you may recall," in the questionnaire, the following elements appeared with scores and frequencies as provided in table 3.

Table 3 obviously represents sporadic and unsystematic occurrences of data elements that respondents have suggested for evaluation. Because these are items suggested by only those who cared to recall them, calculating the mean scores by either the shown frequencies only or by all number of respondents for ranking pur-

Table 3. Elements Recalled and Scored by Respondents

Elements	Score				
	1	2	3	4	5
Call Number	8	1			
Price		1		1	
MARC	2				
A-V Media Information		1			
Dewey Number	2	2	1	1	
LC Class Number	4	1	1		
LC Card Number	2			1	1
Romanization of Author/Title		1			
Location of the Material	1	2			
Series Title	1				
Coauthors				1	
Illustration		1			
Subject Headings	1				
Contents for Volumes		1			

poses would not be appropriate. The inclusion of the call number seems to be of concern to the respondents, as it was cited most frequently.

SUMMARY

In considering a change of library catalogs from one form to another, especially to a machine-readable form (which seems to be a trend), it is advisable to evaluate critically the elements to include in a catalog entry. Including all traditional elements, especially in a machine-readable catalog, would be economically unjustified and functionally ineffective.

The results of the survey of a group of catalog users at the University of Southern California School of Library Science on this topic of catalog elements indicate that the following items are the most useful and necessary ones in the order of their appearance here: heading (author's name), title, date of publication, edition statement, tracing, publisher, author statement (in the body of entry), notes, and place of publication. Call number is regarded as an indispensable element.

News and Announcements

PUBLICATIONS

Basic Video Production

A comprehensive guide for trainers of small format production, *How to Teach Basic Video Production* includes an explanation of single-camera systems, audio, lighting, production planning, editing, and troubleshooting. The manual has instructor's notes, module outlines, module objectives, glossary, scripts and storyboard forms, plus other educational material. The manual is distributed in a loose-leaf form with updates for one year included in the price.

For further information, contact: Ciel Kabler, Multi Media Productions, Inc., P.O. Box 1041, Virginia Beach, VA 23451; (804) 486-6118.

New Publications from Mansell

The Information Society: Issues and Answers

American Library Association's Presidential Commission for the 1977 Detroit Annual Conference. Edited by E. J. Josey, Chief, Bureau of Specialist Library Services, New York State Education Department, New York. ISBN 0-7201-0823-3.

The thirteen essays in this anthology focus on the critical issues that face librarians as a result of the changes taking place in today's society, which enhance the importance of information supply. The collection complements *Libraries in Post-Industrial Society*, also available in the Neal-Schuman Professional Books series from Mansell.

The essays include eight interpretations of the role of the librarian in the postindustrial society, dealing specifically with the impact on libraries on the growth of information supply; technological, social, and economic change; and the public access to information. The remaining five essays are surveys of the literature available on different aspects of librarianship in the postindustrial society.

Quantitative Measurement and Dynamic Library Service

Edited by Ching-chih Chen, Assistant Dean for Academic Affairs, School of Library Science, Simmons College, Boston, Massachusetts. ISBN 0-7201-0826-8.

Today, with limits on the financial resources available to libraries, it is essential to be able to evaluate services and to investigate ways of maximizing the limited resources available. This book is intended for librarians who have no background statistics or systems analysis, but who are interested in applying quantitative methods to various library management problems and adopting a more scientific and better informed approach to decision making.

The book is in two parts. The first consists of four papers dealing with different aspects of the quantitative evaluation of library services. The second part is a collection of thirteen studies on the application of statistical methods of evaluation to specific library problems. Finally, an appendix describes briefly a recent study to develop a data management system for use in the measurement of library services. There is also a glossary of terms and an extensive bibliography.

Send orders to: Mansell, Merrimack Book Service, 99 Main St., Salem, NH 03079; telephone: (617) 685-8149; telex: (710) 342-1696 (Answerback DDCLW).

Address for queries about Mansell titles: Mrs. Catherine Clark, North American Library Representative, P.O. Box 125, Blue Point, NY 11715; telephone: (516) 363-6328.

Information Services on Research in Progress

The first worldwide compilation of systems and services that provide information on scientific research projects in progress is now available in published form.

The directory, *Information Services on Research in Progress; A Worldwide Inven-*

tory, was compiled, edited, and published by the Smithsonian Science Information Exchange. Funded by the National Science Foundation, it was prepared in cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The report presents data on 179 existing and emerging information centers in fifty-three countries. It provides information on items such as the research subjects covered, language in which information is given, a description of the file, data processing methods and techniques used, services provided, conditions of availability, service charges, and names of contacts.

The book, providing an inventory that covers all areas of scientific and technical research, is divided into three sections:

The first section provides an analysis and statistical overview of the world trend in information on current research. The second part contains descriptions of 179 systems dealing with current research project information throughout the world. The third section contains indexes to specific organizations, system names, persons, and subjects.

In the United States, copies may be ordered from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Hard copies cost \$14.50 each; microfiche \$3.00. Request publication number PB-282 025/AS. Outside the United States, copies may be ordered from the Hungarian Central Technical Library and Documentation Centre (OMKDKO, P.O. Box 12, 1428 Budapest, Hungary). The price for a hard copy is \$14.50 in U.S. currency plus postage.

Directory of Libraries Providing Computer-Based Information Services in the New York Metropolitan Area

A new directory of New York libraries will help reference librarians and researchers throughout the country who are developing strategies for computer literature searches. The "Directory of Libraries Providing Computer-Based Information Services in the New York Metropolitan Area: A Selected List" tells which data base terminals are located in seventy li-

braries in New York, New Jersey, and Connecticut. It also names each library's contact person and indicates who may use the data bases and whether the library charges for their use.

Other useful sections of the directory are: the libraries that have terminals for any of seven major data base systems, the data bases offered by each system, descriptions of 116 data bases, and the addresses for the major systems. A subject index to the bases includes such topics as business, chemistry, patents, and pollution.

Library administrators who are considering the acquisition of computer data bases will find the entire directory a valuable consumer's guide. METRO (New York Metropolitan Reference and Research Library Agency) gathered the information from the agency's ninety-two member libraries in the Long Island Library Resources Council and members of Special Libraries Association.

Copies are available for \$10 each (\$15 if an invoice is required). Checks should be made out to METRO and sent to: METRO, 11 W. 40th St., New York, NY 10018.

Directory compilers were Susan Vaughn, Brooklyn College Library; Karen Kinney, Teachers College Library, Columbia University; and Robert Richardson, Montclair State College Library, Montclair, New Jersey.

Database Magazine Begins Publication

Database, a new quarterly journal edited for users of on-line information systems, has begun publication. *Database* is a companion publication to *Online*, the first magazine produced for on-line users. Both are "trade journals" in the sense that they concentrate on practical, how-to articles on searching on-line systems.

Unlike *Online*, which covers the whole field of on-line systems (management, training, search proficiency, hardware, general data base news, etc.), *Database* concentrates exclusively on the specifics of searching each data base. It provides details on both the content of a data base and on the fine points of how it is "loaded" on particular retrieval systems.

One issue contained lengthy "reference-reviews" on *Psychological Abstracts* (on BRS); *SciSearch* (on DIALOG); plus additional articles on *INSPEC* (on BRS), *Oceanic Abstracts* (on DIALOG), *CIS* (on ORBIT), and searching chemistry files for synthetic organic compounds.

The new magazine also contains a letters column, an editorial, and news pages. As its main feature article, *Database* has several distinct types: (1) "reference-review" articles, which both describe and evaluate the data base in depth; (2) "system-specific" articles, which detail how a file is used on a specific retrieval system; (3) "industry-specific" articles, which describe the ways in which a data base is used in a particular industry; and (4) "applications" articles, which focus on a single application for one or more data bases.

Database is published in March, June, September, and December—alternating with the January, April, July and October issue dates for *Online*. Subscription rates are \$52/year (U.S.); \$56/year (Canada and Mexico); \$72/year (foreign airmail).

For further information on *Database*, or to order, please contact: Barbara Marshall, Online, Inc., 11 Tannery La., Weston, Ct. 06883; (203) 227-8466.

SOLINET Long Range Plan

The expectation with which SOLINET charter members created the Southeastern Library Network, Inc., has begun to be realized in the SOLINET Long-Range Plan. On June 20, 1978, the SOLINET Board of Directors approved the plan, which gives more exact direction to SOLINET technical developments and makes possible the creation of a regional bibliographic data base to be used in the development of products and services for SOLINET members.

Projected for development by the SOLINET staff for the coming five years are:

1. on-line access to a SOLINET data base by SOLINET members;
2. SOLINET concentrator in the OCLC network of libraries;
3. on-line access to other data bases, including the Library of Congress, and commercial information retrieval services;

4. SOLINET data base subject search on-line; and
5. an interlibrary loan system for SOLINET members.

The focal point of development for the next eighteen months will be the creation of the SOLINET data base in the Atlanta-housed SOLINET Data Center. The long-envisioned regional library network for SOLINET members will then become technically possible. A Burroughs computer at the Data Center is being used to edit and process the OCLC-MARC tapes, which contain records of SOLINET member transactions with the Ohio-based OCLC computer center.

Each phase of development outlined in the Long Range Plan will be pursued contingent upon members' needs and wishes, human and fiscal resources, and board approval. As the plan evolves—every year it will be updated—the southeastern node of the emerging nationwide library network will become increasingly apparent.

The SOLINET Long Range Plan—1978 is available. The document may be obtained by sending \$7.50, *prepaid only*, to: Long Range Plan, Southeastern Library Network, Inc., Suite 410, 615 Peachtree St., NE, Atlanta, GA 30307.

Freezing the UC Berkeley Card Catalogs—Report Available

The working papers concluding the fourth phase of planning for freezing the card catalogs at the University of California at Berkeley are now available. The packet addresses the issues involved through eight separate reports: "Authority Structure and Links," "Branch Task Forces A & B," "Non-Roman Alphabet Records," "Physical Facilities and Equipment," "Public and Staff Relations," "Records Format and Display," and "Serials." The packet is available from the Librarian's Office, 245 General Library, University of California, Berkeley, CA 94720. All orders must be prepaid (\$7, 164p.); make check payable to the Regents of the University of California.

SWLA/CELS Journal Discontinued

Effective immediately with volume 3, number 2, the Southwestern Library As-

sociation is discontinuing the SWLA/CELS *Current Awareness Journal*.

The decision was based not on the merit of this project but on the expense. Although the journal is critically acclaimed, production costs have continued to exceed subscription revenue.

Encyclopedia of Information Systems and Services (3d Edition)

Encyclopedia of Information Systems and Services: A guide to Information Storage and Retrieval Services, Data Base Producers and Publishers, On-line Vendors, Computer Service Companies, Computerized Retrieval Systems, Micrographic Firms, Libraries, Government Agencies, Networks and Consortia, Information Centers, Data Banks, Clearinghouses, Research Centers, Associations, and Consultants, third edition, edited by Anthony T. Kruzas (xvi +1,030 pages) and published by Gale Research Co., Detroit, 1978. LC Card No. 78-14575. ISBN 0-8103-0940-8. \$95.

New Information Systems and Services. Several issues covering the period between the third and fourth editions. Soft Covers. Cumulative Indexing. Published by Gale Research Co. ISBN 0-8103-0941-6. Subscription, with binder, \$60. (First issue in preparation)

A comprehensive guide to the information marketplace, Gale's *Encyclopedia of Information Systems and Services*, third edition, provides 2,094 detailed entries on more than 2,500 organizations, including over 400 foreign organizations in fifty-six countries. The encyclopedia covers computer service companies, publishers, libraries, professional societies, government agencies, research organizations, information centers, micrographic firms, clearinghouses, consultants, and other organizations that produce, process, store, and use bibliographic and nonbibliographic information.

A broad subject coverage of the information marketplace is provided, with greatest emphasis on science-technology, biomedicine, business-economics, social sciences, and law. Services covered include data

base publishing and vending, time sharing, selective dissemination of information (SDI), information on demand, retrospective search services, data collection and analysis, computerized text editing, networking, research, micrographic storage and retrieval, consulting, library automation, and abstracting and indexing.

Not included in the encyclopedia are printed commercial and legal services, academic and special libraries with traditional reference services only, public information offices, computer and micrographic hardware manufacturers and distributors, general purpose data management systems, conventional indexing and abstracting services, libraries with minimal library automation activities, and network participants without special services of their own.

Directory of Library Research and Demonstration Projects, 1966-75

The Department of Health, Education, and Welfare, Office of Education, announces the availability of the *Directory of Library Research and Demonstration Projects, 1966-75*.

From 1966 to 1972, the principal emphasis of the Library Research and Development program was on technology. Several projects were funded to apply computers to library functions, to develop and encourage use of microforms, and to develop library organization and management. The program changed emphasis in 1972 to education of the handicapped; innovation and pluralism in education; elimination of racial, ethnic, and cultural barriers to educational opportunities; and career education development.

The directory is a comprehensive record of the projects. The information included is the institution, geographic location, principal investigator, duration, contract number, dollar value, and project description.

Copies of the directory are available free of charge from the Office of Libraries and Learning Resources, Research and Demonstration Branch, Room 3319-A, 7th & D Streets, SW, Washington, DC 20202. Send self-addressed mailing label with request.

***The Network Security Center:
A System-Level Approach
to Computer Network Security***

This report describes a unique approach to the solution of computer network security problems, and provides guidance in the areas of network security architectural issues and implementation options. The approach is based on a network resource, called a Network Security Center (NSC), which performs the functions of user identification/authentication and access request authorization. The NSC works in concert with Network Cryptographic Devices (NCDs) to enforce access control policy through the creation or denial of logically separate cryptographic connections between subjects (users) and objects (resources). The use of a NSC in a network permits effective control over network access, provides for audit data collection, and provides protection against tampering or modification of the access control data base. The architecture presented permits regional subnets, and local control over resources. Network Cryptographic Devices that use the NBS Data Encryption Standard algorithm and are capable of being remotely keyed are a vital part of the NSC security approach. NCDs provide end-to-end cryptographic message protection, source-destination authentication of identity, and, through the remote keying capability, the enforcement mechanism for NSC access control decisions. Implementation options for an NSC are presented, covering the areas of data structures, I/O structure, control structure, and size and performance limitations.

Available from Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, DC 20234, for \$6, order number SD no. 003-003-01881-3.

RESEARCH

Study of Online Searching Process Awarded to Cuadra Associates

Finding more effective ways to teach the use of computer-based on-line systems is the objective of a study contract (NLM N01-LM-8-4734) recently awarded to Cuadra Associates, a Santa Monica-based

firm, by the U.S. National Library of Medicine. The one-year study will be performed by the firm and its subcontractor, King Research.

According to Judith Wanger, vice-president of Cuadra Associates and director of the project, its basic purpose is to determine the relationship between the type of training that individual on-line searchers receive and the quality and style of searching.

The users of on-line systems are trained in a variety of ways. Some receive formal training from the organizations that operate the on-line services. The National Library of Medicine, which provides on-line access to MEDLINE and other biomedical data bases, as part of its congressionally mandated information dissemination role, has trained thousands of searchers. The extensive and well-articulated training program at NLM involves a series of formal workshops at different levels of instruction, supported by a computer-aided instruction program and several multimedia packages. "Many other searchers of NLM's on-line system have been trained by their colleagues or else they train themselves," Wanger said. "Some of them develop their skills through a combination of training approaches. For example, they may receive formal training on another system and get informal training on NLM data bases from their colleagues or may teach themselves how to use the system, using only the system manual and guides. This diversity makes our research job very complicated, but it also makes it very interesting."

Because the study is sponsored by the National Library of Medicine, it will focus on searchers who use NLM's retrieval system. A total of about 200 of these searchers will be invited to take part in the study. The result of the searches they will be asked to perform will be coded to maintain confidentiality, and the data will be aggregated in several ways for comparative analysis. A major comparison will be between those searchers who were formally trained under NLM auspices and those who developed their skills in other ways.

Cuadra Associates, established early in

1978, is an independent company that provides research, development, and consulting in the area of on-line data base services, data base product planning, user education, and related aspects of the library and information science field.

AFIPS Announces Major Program on History of Computing; Proposed Center for the History of Computing Is under Study

The American Federation of Information Processing Societies, Inc. (AFIPS) is launching a number of major activities covering the history of computing. The multifaceted program will be carried out by the federation's History of Computing Committee under the chairship of Jean E. Sammet of the IBM Federal Systems Division, Cambridge, Massachusetts. In recognizing the importance of this undertaking, the AFIPS Board of Directors authorized a continuing program which will cover a number of important areas relating to the history of computing and has asked the committee to study the concept of a permanent Center for the History of Computing which would manage the federation's archival activities and related efforts.

"Few fields of modern endeavor," notes Sammet, "have had so profound and revolutionary an impact on society as computers. Without adequate preservation of our history, we may unduly limit our future." The concept of the Center for the History of Computing will enable AFIPS to meet its responsibilities in this area while taking cognizance of other work, activities, and groups concerned with preserving and using computing history.

The committee is approaching its tasks through a number of important activities. Initial priority will be given to a study of the problem of archiving historical information, including possible establishment of a Center for the History of Computing. In addition, a number of other important projects are now underway. These include development of audiovisual materials for educational purposes; guidance in developing the annual Pioneer Day program featured at each National Computer Conference; encouragement and assistance to the

AFIPS Constituent Societies on special conferences, sessions, and preservation of their own archives; encouragement of historical research, possibly through the awarding of prizes and/or fellowships; and provision of volunteer support to the Smithsonian Institution on relevant activities. An underlying theme of the total program is to make individuals more aware of the importance of the history of computing and its potential impact on future developments.

A number of subcommittees have been established to expedite these activities. These subcommittees and their chairs include: General Archive Problem: Dr. Arnold A. Cohen, University of Minnesota; Audio-Visual Aids: James Van Speybroeck, Scott Community College; Pioneer Day: Henry Tropp, Humboldt State University; Constituent Society Liaison: Joe Ann Clifton, Litton Industries; Smithsonian Liaison: William P. LaPlant, Jr., Air Force Data Services Center; and Research Encouragement: Erwin Tomash, Data-products Corporation.

The General Archive Problem Subcommittee is currently analyzing archival problems and developing a definition and implementation plan for a possible Center for the History of Computing. The proposed center would serve as a central coordinating office for archival and other historical functions performed by AFIPS. This concept envisions a network of autonomous AFIPS-affiliated history centers primarily located in universities, museums, or governmental organizations. The center, according to present thinking, would provide central clearinghouse services for computing history and would be headed by a professionally qualified director supported by a small staff.

The activities of the other subcommittees are expected both to draw upon and supplement the archival function. Audio-Visual Aids will pursue a dual function. One is preparation of a series of slide presentations portraying various aspects of the history of computing which will be made available to universities, other educational bodies, and to chapters of the AFIPS Constituent Societies. The second function is to compile a catalog of existing audiovisual

material for use by any group seeking such information. Efforts of the Pioneer Day Subcommittee will be concentrated on developing a consistent overall framework within which each Pioneer Day program will be structured, organized, and presented; included will be development, coordination, and preservation of relevant historical material.

Constituent Society Liaison will address the task of assisting the AFIPS Constituent Societies, making certain that the other AFIPS History of Computing Committee activities do not interfere with their existing programs, and guarding against unnecessary duplication of effort. The subcommittee's activities fall into two major areas: (1) providing assistance on special conferences, sessions, and specialized bibliographies; and (2) helping and encouraging the societies in development of archives and histories of their own activities. Supplementing all the archival activities, the Research Encouragement Subcommittee will seek to establish a program of incentives to foster professional research in the history of computing. Present activities include study of a possible fellowship program to encourage the entry of students into the history of computing, and a possible award program to provide visibility and recognition for work currently being carried out.

Because of the vast amount of material now held by the Smithsonian Institution, and the relatively small staff they have to deal with it, a Smithsonian Liaison Subcommittee is being established. It will attempt to provide volunteer assistance in a variety of ways, including the processing of oral history transcripts and the cataloging of written computer material.

In all its activities, the History of Computing Committee will work closely with Bernard A. Galler of the University of Michigan, editor-in-chief of the recently announced AFIPS journal, *Annals of the History of Computing*.

Computerized System Allows Libraries to Pool Information

In the Federal Republic of Germany, plans are being drawn up for a more extensive integration of libraries into national

and international information networks. The German Ministry of Research and Technology, for instance, intends to sponsor the setup of library centers in the individual German Bundeslaender (states) as a project for the next few years. For projects of this type, Siemens AG has developed BVS, a new computerized library integration system. It lends itself to the automation of all bibliographic assignments in big libraries as well as to the creation of library pools on a local or regional level.

BVS is a computer program system permitting bibliographical or other library-specific data to be captured, modified, searched for, and retrieved. It enables a stock of bibliographical and subject-indexing data to be assembled on the basis of a freely selectable classification scheme and includes provisions for incorporating already existing data. BVS permits the automation of all library functions, such as accessioning, cataloging, and lending, and also provides an information service. The system can be used both in the on-line and in the batch mode.

Search criteria for the retrieval of stored data can be specified at random and the number of descriptors used in wording the search questions is not limited. If desired, a three-level authorization check system may be employed to bar certain users from access to certain data, or to enable only certain users to update data files.

Standard interfaces allow BVS to be expanded not only by specific user programs for individual libraries but also by already existing standard programs, e.g., the library catalog system BIKAS2. BVS also features communication interfaces to local lending systems. It can be run on any Siemens System 4004 or 7.007 computer with a main memory capacity of about 450 KB. In all, up to 254 display terminals can be connected.

COURSES AND SEMINARS

Computer Concepts Course for Computer Students

A self-instructional course providing information useful to first-time computer students has been announced by Info 3,

publishers of audiocassette EDP courses. *Computer Concepts for Small Business (CCSB)* covers basic computer concepts, including hardware, software, types of data and how it is processed, and roles of EDP personnel, how systems are developed, how to select a computer, and how to negotiate with vendors.

CCSB provides a broad understanding of the concepts needed in order to interact with or to use computer services in the business environment. Also, it is designed to provide academic departments with an individual instructional training tool to supplement textbook materials. For learning resource centers, it serves as reference material as well, due to the organization of appendixes and bibliographies.

One attribute of this course is its coverage of micro-computers and computer stores, something not prevalent in other computer concepts courses for business.

Each of the eight lessons is preceded by a specific set of learning objectives and ends with a review quiz. The appendixes include a glossary, extensive annotated references, and journal articles related to the lessons.

A GOT chart showing goals, objectives, and tasks for this course is available free. It shows in detail the learning sequence and the measurable skills taught in the course.

The course contains more than two-and-a-half hours of instructional audiocassette tapes plus a workbook of over 200 pages. Time to take the course ranges between four and six hours. The single-copy price is \$145.

For more information, contact Info 3, 21241 Ventura Blvd., Suite 193, Woodland Hills, CA 91364. Toll-free number is (800) 423-5205; in California (213) 999-5753, collect.

New Specialist Degree at Graduate Library School of Indiana University

The Graduate Library School of Indiana University has announced the development and implementation of a new program of graduate study leading to the Specialist Degree in Library and Information Science, which began in the spring semester (January) 1979. Intended primarily as a

vehicle for practicing librarians to obtain a structured program of advanced study without going all the way to the Ph.D., the specialist degree requires the completion of thirty hours of course work, of which fifteen must be taken in library and information science. The other fifteen hours may be taken in another field related to the student's career goals, such as higher education, instructional technology, business management, or public administration. Fifteen of the thirty hours must be taken on the Bloomington campus of Indiana University. There is no formal residency requirement in the sense of a prescribed number of courses to be completed within one semester or summer session (i.e., the entire program may be taken on a part-time basis), but the program must be completed within a period of five years.

Basic admissions requirements are a grade point average of *B* in graduate and upper level undergraduate work and three letters of recommendation. Ordinarily the school will expect candidates to have a minimum of two years of successful experience following receipt of the master's degree, but consideration will be given to students who may find it advantageous to proceed directly into the specialist program. The program assumes that candidates will have earned the Master of Library Science Degree or a master's degree in a closely related field and that they will already possess a knowledge of the fundamental areas of library science. Thus, the program is open to recipients of the Master of Education Degree who may have specialized in school media center work and who have thus achieved mastery of the basic core of librarianship. The program is also open to graduates of library science programs not yet accredited by the American Library Association.

The program for specialist candidates will be planned with the advisory committee on an individual basis with the career goals of the student being the primary consideration.

For further information, contact: Dr. George Whitbeck, Associate Dean, Graduate Library School, Indiana University, Bloomington, IN 47401.

Courses in PRECIS Indexing in 1979

Interest continues to grow in this method of subject indexing designed for use in automated systems. A two-week course in the application of PRECIS (the *Preserved Context Index System*) will be offered next year in two Canadian locations, July 30–August 10 in Edmonton and August 20–31 in Toronto.

The Toronto course is sponsored by the Faculty of Library Science, University of Toronto. Joint sponsors of the Edmonton course are the Faculty of Library Science, University of Alberta, and the Edmonton Public Library.

The instructors will be Derek Austin of the British Library, developer of the system, and Jutta Sørensen of the Danmarks Biblioteksskole, Copenhagen, foreign language consultant for the PRECIS translingual project.

The British Library's PRECIS course has been given twice previously in North America, in 1977 at Dalhousie University, Halifax, and in June 1978 at the University of Maryland. While in the United States for the latter course, Austin was honoured by the American Library Association, receiving the Margaret Mann Citation for 1978.

The setting up of courses in two regions was promoted by inquiries from many sources.

CONTACTS; *Edmonton*—Professor Andre Nitecki, Faculty of Library Science, University of Alberta, Edmonton, Canada, T6G 2J4; telephone: (403) 432-4729. *Toronto*—PRECIS Course 1979, Faculty of Library Science, University of Toronto, 140 St. George Street, Toronto, Canada, M5S 1A1; telephone: Irene McCordick (416) 881-2635.

**MEETINGS
AND CONFERENCES****Sixteenth Annual Clinic on Library
Applications of Data Processing**

The Graduate School of Library Science and the Office of Continuing Education and Public Service, University of Illinois, held the Sixteenth Annual Clinic on Library Applications of Data Processing

April 22–25 in the Illini Union, University of Illinois at Urbana-Champaign. The theme of the clinic was the Role of the Library in an Electronic Society.

The theme was a timely one: There is evidence to suggest that society is moving rapidly toward a largely paperless communication system, one in which many types of publications may disappear in print-on-paper form to be replaced by electronic alternatives. The implications for libraries and librarians are obvious.

The meeting looked at various technological developments that may lead us into a paperless society and discussed the implications of these developments for libraries.

Major presentations were:

- *Happiness Is a Warm Librarian* by Derek de Solla Price, Avalon Professor of the History of Science, Yale University, New Haven, Connecticut.

- *Prospects for an Electronic Journal* by Richard Roistacher, research associate, Bureau of Social Science Research, Washington, D.C.

- *The Impact of Technology on the Production and Distribution of News* by Carolyn Marvin, lecturer, Institute of Communications Research, University of Illinois, and Mary Mander, visiting lecturer, Department of Journalism, University of Illinois.

- *Technical Services in an Electronic Library* by Michael Gorman, director of technical services, University Library, University of Illinois at Urbana-Champaign.

- *Prospects for a Dynamic Library* by Gerard Salton, professor of computer science, Cornell University, Ithaca, New York.

- *Future Directions for Machine-Readable Data Bases and Their Use* by Martha Williams, research professor, Coordinated Science Laboratory, and professor of library science, University of Illinois.

- *The Status of Paperless Systems in the Intelligence Community* by Robert Hooper, chief, systems analysis staff, Office of Central Reference, Central Intelligence Agency, Washington, D.C.

- *Electronic Mail and the Office of the*

Future by Leonard G. Levy, manager, advanced systems, Combustion Engineering Inc., Stamford, Connecticut.

- *Electronic Information Exchange and Its Impact on Libraries* by Murray Turoff, director of the Computerized Conferencing and Communications Center, New Jersey Institute of Technology, Newark, and Starr Roxanne Hiltz, chairperson, Department of Sociology and Anthropology, Upsala College, East Orange, New Jersey.

- *Computer Technology: A Forecast for the Future* by William J. Kubitz, associate professor of computer science, University of Illinois.

- *Scenario for an Electronic Library* by F. W. Lancaster, professor of library science, University of Illinois; Laura Drasgow, research associate, Library Research Center, University of Illinois; and Ellen Marks, research associate, Library Research Center, University of Illinois.

Annual Meeting—Canadian Association for Information Science

The Canadian Association for Information Science (CAIS) will hold its seventh annual conference May 12–15, 1979, at the Banff Springs Hotel, Banff, Alberta (located in the heart of the scenic Rocky Mountains just west of Calgary).

The theme of the conference is "Sharing Resources, Sharing Costs." Three to four hundred information specialists (computer scientists, librarians, documentalists, etc.) will gather to share experiences and present ideas on dealing with budget restraints and expanding needs.

The American Society for Information Science (ASIS) Conference, sponsored by WESCAN ASIS, will be held in Banff immediately following the CAIS conference.

For further information, please contact: Ronald F. Peters, Publicity and Publications Chairman, c/o Environmental Design Unit, University of Calgary Library, Calgary, Alberta, T2N 1N4; (403) 284-6828.

Conference Planned on Federal Information Policies and Access

"Federal Information: Policies and Access" will be the theme of the third annual

institute on federal information sponsored by the American University.

The institute, which features both policy discussion and "nuts and bolts" information, will enable participants to explore such subjects as federal data bases and software programs, their accessibility, cost, and future; on-line developments; retrieval of fugitive government publications; micro-republishing, archival collections; national library developments, congressional information, and federal agency practices; and private sector sources of federal information.

The two-day meeting, to be held in Washington, D.C., May 17–18, 1979, will be of particular interest to librarians and information specialists in the public and private sectors, information entrepreneurs, federal agency publishers and editors, and representatives of professional and trade associations who pursue federal information.

Questions should be addressed to Melinda Beard, College of Public Affairs, American University (202) 686-2513.

Towards 2001—New Information Technology and Its Future Impact

Advances in information technology and their future impact on both society and the information profession will be the subject of the 1979 Annual Conference of the Institute of Information Scientists, being held at the Imperial Hotel, Torquay, on 6–8 June 1979.

This international conference will bring together different sectors of the information industry to discuss the development of information technology in the twenty-one years since the founding of the IIS and consider what changes are foreseen over the next twenty-one years.

The four main sessions will cover:

1. Overview of the role of information science in the post-industrial society.
2. Specific technological developments.
3. Information technology and the information profession.
4. Impact of the information industry on society.

On-line systems and the impact of telecommunications, micrographics and holographic storage of data, Viewdata pros-

pects, educational developments, national library networks, social and psychological consequences, and parliamentary and press control of information are among the topics to be discussed by the international panel of speakers and chairmen.

Conference fee is £90 (£70 to members of IIS). Brochure and booking forms will be available from the conference secretary: Mike Allen, Head of Information Services Unit, Beecham Pharmaceuticals, Coldharbour Road, The Pinnacles, Harlow, Essex, England.

Symposium on User-Effective Information Systems

The eighteenth annual technical symposium of the Association for Computing Machinery (ACM), Washington, D.C., chapter, and the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology will be held June 21, 1979, at the NBS Gaithersburg, Maryland, headquarters.

The theme of the symposium is "Information Systems—Effectiveness for the User." It will be concerned with both good technical design of systems and their fulfillment of the human or organizational purposes they are intended to serve. Some of the topics will be: "Computing for the Handicapped User," "Design of Information Systems," "Design Management and Utilization of Data Base Systems and Data Base Networks," "Documentation of Systems and Procedures, User Training, and Post-implementation Audit and Review," "Supercomputers," "Evaluation and Validation of the Performance of Hardware, Software, or Firmware," "Interfaces between Users and Data Bases," "Large-scale Applications," "Novel Applications, Techniques, and Hardware," and "Per-

sonal Computing, and Possible Faces with Large Computers and Data Bases."

For information concerning the symposium's technical program, write to Angela Turvey, 4910 Butternut Drive, Rockville, MD 20853.

Fifth International Conference on Very Large Data Bases

The Fifth International Conference on Very Large Data Bases has been scheduled for October 3-5, 1979, in Rio de Janeiro, Brazil.

R. J. Libero and Jose Schiffini, both of IBM-Brazil, have been named general conference chair and steering committee chair, respectively. Stanley Y. W. Su of the University of Florida will serve as U.S. conference chair, and V. W. Setzer of the University of Sao Paulo, Brazil, will serve as Latin American conference chair.

Howard L. Morgan of the University of Pennsylvania is the U.S. program chair, and Antonio Furtado of Pontificia Universidade Catolica, Brazil, is Latin American program chair. According to Morgan, contributed papers were accepted through March 5, 1979. Contributors from Latin America were to contact Professor Furtado, and all others, Professor Morgan.

As one of the first international computer conferences to be held in Latin America, the conference was expected to generate widespread interest in the computing community. A number of related local activities and special travel arrangements were planned in conjunction with the conference.

For additional information contact: Roger W. Elliott, Computer & Information Sciences Dept., University of Florida, Gainesville, FL 32611; (904) 392-2371.

Book Reviews

Micrographics, by William Saffady. Littleton, Colo.: Libraries Unlimited, 1978. 238p. \$15. LC: 78-1309. ISBN: 0-87287-175-4.

One advantage of being a very bright, extremely competent bundle of energy is that you have more options when faced with a problem. Take the case of Dr. Saffady, who, unable to find a fully satisfactory text for the micrographics course he teaches at the School of Library and Information Science at SUNY Albany, took the easy way out by writing one. I think *Micrographics* is the best text available for teaching librarians about that subject. It is comprehensive, covering everything from the history of micropublishing to the newer technologies of computer input microfilm and microfacsimile transmission. The icing on the cake, however, is that like all of Saffady's writings, *Micrographics* is most readable. The illustrations are not masterworks of high quality printing and layout, but with very few exceptions, they are well chosen to illustrate the text.

Micrographics is an excellent first source. However, it does not give exhaustive detail on any aspect of micrographics for it is first and foremost a textbook and will be most useful when interpreted, expanded upon, and used as a basis for discussion by a well-qualified teacher.

The flaws in this work do little to diminish its value, but they are annoying, especially since it is generally so well done and so needed. Of minor importance, but immediate impact, is the cheap cover executed in an off-shade of unborn pumpkin. More significant, the book necessarily references a lot of the literature of library micrographics and thereby too often tends to legitimize writings which are second- and third-order literary pollution. Also, a number of references are too old to be meaningful in this fast-changing technical field.

Micrographics also contains some errors and some questionable assertions. For example, in reading about the pros and cons of roll film, one finds the statements: "A high quality microfiche reader can be purchased for about two hundred dollars. A reel microfilm reader of comparable quality costs about twice as much." Another instance is reference 24 of chapter one. The reference does not include the information for which it is a reference and there is a mistake in the title and in the pagination of the reference.

Micrographics is worth more than any two basic micrographics seminars I have ever attended and it costs only fifteen dollars. Cheap cover and all, it's a great bargain.

Carl M. Spaulding
Council on Library Resources

Book Theft and Library Security Systems, 1978-79, by Alice Harrison Bahr. White Plains, N.Y.: Knowledge Industry Publications, 1978. 128p. \$24.95 LC: 77-25284. ISBN: 0-914236-14-8.

This book is intended as a manual for the library practitioner weighing solutions to the problem of theft of library materials. Eight chapters introduce the reader to the seriousness of library theft, investigating the extent of losses (and how to finance such measurement), electronic security systems marketed for libraries, a survey of users of such systems, alternatives to electronic systems, and the protection of library materials other than books. An appendix of libraries presently using electronic security systems follows with a short bibliography and index.

Bahr presents a readable, although slim, text which gathers together in one volume basic descriptive data on the major electronic security systems presently installed or being sold in the United States. Certainly this could be advantageous for the

busy library manager. However, one should bear in mind that much of the information presented is available directly from each vendor and in greater detail.

In discussing possible techniques to use in establishing base-line data relative to materials loss, Bahr identifies the book census, inventory, and sample. Methodologies and formulas are offered with citations to the professional literature provided as documentation. The inadequate verification of sampling technique, for example, should alarm a skeptical library manager looking for solid operational guidance.

The comparison of available electronic security systems is useful and updates the much more comprehensive *Library Technology Reports* of November 1976. A brief discussion of alternatives to electronic systems and the protection of serials and nonbook materials serves to whet the reader's appetite for more.

Perhaps the most beneficial aspect of this volume is its attempt to treat a complex problem "holistically" through the identification of a variety of factors having impact on the problem. It may be an impossible goal to meet, however, as the book suffers from relatively scant coverage of each topic throughout.

The paperbound volume is typewritten, with an unannotated bibliography and a very brief index. The references reflect a fairly comprehensive search of the professional literature, but with very little hard empirical data in evidence. This title is a

useful reference but not a *vade mecum* on the topic.

Craig R. Conover
Sussex County Library System
Newton, New Jersey

BOOKS RECEIVED

Analytical Access: History, Resources, Needs, by Richard J. Hyman. Flushing, N.Y.: Queens College of the City of New York, 1978. 68p. \$5. LC: 78-18413. ISBN: 0-930146-12-3.

Closing the Gap between Technology and Application: Proceedings of the 1977 EDUCOM Fall Conference. Boulder, Colo.: Westview Press, 1978. 215p. \$20. LC: 78-2233. ISBN: 0-89158-167-7.

The Directory of Fee-Based Information Services, 1978-79, by Kelly Warnken. Woodstock, N.Y.: Information Alternative, 1978. 96p. \$5. LC: 76-55469.

A National Periodicals Center: Technical Development Plan. Washington, D.C.: Council on Library Resources, 1978. 255p. LC: 78-14692.

Non-Book Materials in Libraries: A Practical Guide, by Richard Fothergill and Ian Butchart. Hamden, Conn.: Linnet Books, 1978. 256p. LC: 78-15999. ISBN: 0-208-01673-2.

Systems Analysis in Libraries: A Question and Answer Approach, by Chet Gough and Taverekere Srikantaiah. Hamden, Conn.: Linnet Books, 1978. 158p. \$9.50. LC: 78-7539. ISBN: 0-208-01753-4.

The Editorial Board wishes to thank Eileen Mahoney and Chere Elliott of the Central Production Unit at ALA for their excellent judgment in restyling the journal. We believe this contemporary and attractive use of typography will make the journal more appealing and readable.

INSTRUCTIONS TO AUTHORS

The *Journal of Library Automation* welcomes manuscripts related to all aspects of library and information technology. Some specific topics of interest are mentioned on the masthead page. Feature Articles, Communications, Letters to the Editor, and News Items are all considered for inclusion in the journal. Feature Articles are refereed, other items generally are not. All material is edited as necessary for clarity or length.

Manuscripts must be typewritten; a single copy is sufficient. All text must be double spaced, *including footnotes and references*. Manuscripts should conform to *A Manual of Style*, 12th ed., rev. (Chicago: University of Chicago Press, 1969). Illustrations should be prepared carefully as camera-ready copy, neatly drawn in a professional manner on separate sheets of paper. Manuscript pages, bibliographic references, tables, and figures should all be numbered consecutively.

Feature Articles consist of original research, state-of-the-art reviews, or comprehensive and in-depth analyses. They may be from ten to twenty-five pages in length. An abstract of 100 words or less should accompany the article on a separate sheet. Headings should be used to identify major sections. Authors are encouraged to relate their work to other research in the field and to the larger context of economic, organizational or management issues surrounding the development, implementation, and use of particular technologies.

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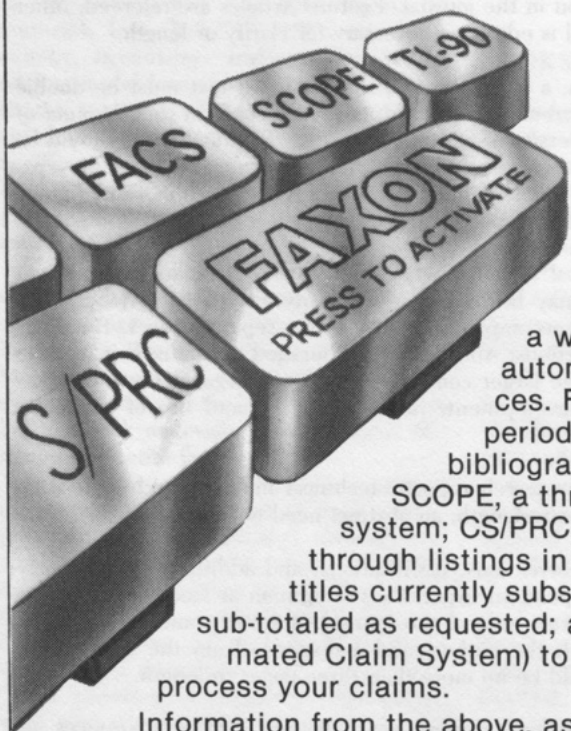
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News Items may announce publications, conferences, meetings, products, services, or other items of note. These should be limited to two pages in length.

Book Reviews are assigned by the book review editor. Readers wishing to review books for the journal are invited to contact the book review editor, indicating their special areas of interest and expertise.

Names and addresses of the journal editors may be found in paragraph three on the masthead page. In all correspondence please include your own name, institutional affiliation, mailing address, and phone number.

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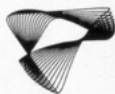
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Scheduled for publication in 1979 are:

MINICOMPUTERS IN LIBRARIES, 1979-80.

By Audrey N. Grosch (March 1979) -- library automation... distributive processing... minicomputer hardware and software... disks vs. cassette tape... input and output services... communications equipment... directory of libraries with systems.

THE FUTURE OF THE CATALOG: THE LIBRARY'S CHOICES.

By S. Michael Malinconico and Paul Fasana (April 1979) -- book form... microform... cards... on-line... pros and cons of each approach... technology, economics and near-term prospects.

AUTOMATED LIBRARY CIRCULATION SYSTEMS, 1979-80.

By Alice Harrison Bahr (2nd ed., April 1979) -- overview of library circulation systems... available systems (CLSI, Checkpoint/Plessey, Gaylor, 3M, IBM, etc.)... why and how to automate... implications and trends... directory of manufacturers and libraries.

THE LIBRARY MANAGER'S GUIDE TO AUTOMATION.

By Richard W. Boss (May 1979) -- potential of automation... the risks... planning... manager's role in selection and negotiation... when not to automate... training and interpersonal relations... case histories... selling the program... trends in automation.

VIDEO IN LIBRARIES, 1979-80.

By Alice Harrison Bahr (2nd ed., August 1979) -- types of equipment... library experiences... types of programming... programming centers... cable... new technology.

PHOTOCOPYING IN LIBRARIES.

(2nd ed., tentative) -- the photocopying "problem"... summary of previous studies... impact of copyright law... Copyright Clearance Center... early experiences.

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LIBRARY NETWORKS, 1978-79.

By Susan K. Martin (3rd ed., 1978) -- computer-based library network developments... OCLC's new organizational structure... BALLOTS and WLN as full-fledged network utilities... national bibliographic network.

MICROFORMS: THE LIBRARIANS' VIEW, 1978-79.

By Alice Harrison Bahr (2nd ed., 1978) -- selection... acquisition... uses... space and financial implications... maintenance and processing... viewing equipment.

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Right now! Just as we deliver to LCSH/8) with LCSH proven software. The same staff. The most up-to-date

B/NA technical services include college, research, and special libraries around the world.

To sum up, then, we would like to speak with you about some, or all of the following:

- shelflist conversion to MARC;
 - database management of OCLC (or other network) records;
 - book, (COM) fiche, or film catalogues;
- and, of course,
- Subject Authority Control by LCSH/8.

Please call (503) 643-8423. Or write to Blackwell North America, 10300 S.W. Allen Blvd., Beaverton, Oregon 97005. Ask for Michael Moen, one of the twelve librarians on our technical services staff, all of whom are knowledgeable about MARC structure, COM fiche and film catalogues and, of course, fully automated Subject Authority Control by LCSH/8.

