

LIBRARY RESOURCES & TECHNICAL SERVICES

Vol. 28, No. 1

January/March 1984

CONTENTS

	<i>Page</i>
From the Editor's Desk . . .	3
An Analysis of Reviews and Library Holdings of Small Publishers' Books. <i>Judith Serebnick and John Cullars</i>	4
Book Production Quality: A Librarian's View; or, The Self-Destructing Library. <i>Paul H. Mosher</i>	15
<i>The Indian National Bibliography</i> —Its Present State and Future Prospects. <i>Joel C. Downing</i>	20
Considerations in the Creation of a Holdings Record Structure for an Online Catalog. <i>Arnold Hirshon</i>	25
Electronic Publishing and Its Impact on Libraries: A Literature Review. <i>Meredith Butler</i>	41
Technical Services in the Age of Electronic Publishing. <i>Edwin Brownrigg, Clifford Lynch, and Mary Engle</i>	59
Electronic Publishing and Library Technical Services. <i>Brian Aveney</i>	68
Electronic Publishing, Libraries, and the Survival of Information. <i>Gordon B. Neavill</i>	76
In Memoriam: John W. Cronin	90
Instructions to Authors	91
Index to Advertisers	92

EDITORIAL BOARD

Editor, and Chairperson of the Editorial Board. ELIZABETH L. TATE

Assistant Editors:

PHYLLIS A. RICHMONDfor Cataloging and Classification Section
EDWARD SWANSON

CAROLYN C. MORROWfor Preservation of Library Materials Section

FRANCIS F. SPREITZERfor Reproduction of Library Materials Section

MARTIN J. FAIGELfor Resources Section

LINDA SAPPfor Serials Section

Editorial Adviser:

DORIS H. CLACK (for Regional Groups)

Liaison with RTSD Newsletter:

ARNOLD HIRSHON, *RTSD Newsletter* Editor

Library Resources & Technical Services (ISSN 0024-2527), the quarterly official publication of the Resources and Technical Services Division of the American Library Association, is published at ALA Headquarters, 50 E. Huron St., Chicago, IL 60611. *Business Manager:* William Bunnell, Executive Director, Resources and Technical Services Division of the American Library Association. *Advertising Sales Manager:* Mary E. Swenson, ALA Headquarters. *Editorial Office:* 11415 Farmland Drive, Rockville, MD 20852. *Advertising Traffic Coordinator:* Leona Swiech, Central Production Unit/Journals, ALA Headquarters. *Subscription Price:* to members of the ALA Resources and Technical Services Division, \$10 per year, included in the membership dues; to nonmembers, \$20 per year; single copies \$5.

Second-class postage paid at Chicago, Illinois, and at additional mailing offices. POSTMASTER: Send address changes to *Library Resources & Technical Services*, 50 E. Huron St., Chicago, IL 60611.

Library Resources & Technical Services is indexed in *Library Literature*, *Library & Information Science Abstracts*, *Current Index to Journals in Education*, *Science Citation Index*, and *Hospital Literature Index*. Contents are listed in *CALL (Current Awareness—Library Literature)*. Its reviews are included in *Book Review Digest*, *Book Review Index*, and *Review of Reviews*.

Instructions for authors appear on p.91-92 of the January/March 1984 issue of *Library Resources & Technical Services*. Copies of books for review should be addressed to Arnold Hirshon, Editor, *RTSD Newsletter*, Cabell Library, Virginia Commonwealth University, 901 Park Ave., Richmond, VA 23284. Do not send journal issues or journal articles for review.

The contents of this journal, unless otherwise indicated, are copyrighted by the Association. All material in this journal copyrighted by the American Library Association may be photocopied for the noncommercial purpose of scientific or educational advancement.

© American Library Association 1984

Publication in *Library Resources & Technical Services* does not imply official endorsement by the Resources and Technical Services Division nor by ALA, and the assumption of editorial responsibility is not to be construed necessarily as endorsement of the opinions expressed by individual contributors.

From the Editor's Desk . . .

As this new year begins, the present and the future will be much on the minds of those who have read George Orwell's seminal work. It has been much on the mind of the editor as this issue was prepared. The first four papers, consequently, reflect the state of the art today. Serebnick and Cullars report their interesting investigation of the relationship between library holdings and book reviews of the output of small presses. Mosher expresses his concerns about book production quality, while Joel Downing paints a disheartening picture of the problems besetting *The Indian National Bibliography*. Hirshon's suggestions for the creation of holdings records in the automated environment remind us that the automated environment of tomorrow will be the world of electronic publishing. Its promises and its threats provide the theme for the four papers on what may well be the state of the art tomorrow. Butler's literature review offers many good suggestions for background reading on tomorrow's world. The two papers that follow, one by Edwin Brownrigg and his colleagues and the other by Brian Aveney, predict the probable effects of electronic publishing on the particular world of the technical services librarian. Gordon Neavill's words of caution for scholars and librarians conclude the series as he points out that electronic publishing may very well bring the fulfillment of one of "the sacred principles of Ingsoc"—"the mutability of the past."*—*Elizabeth L. Tate*

*George Orwell, 1984 (New York: New American Library, c1949), p.23.

An Analysis of Reviews and Library Holdings of Small Publishers' Books

Judith Serebnick and John Cullars

At a time of continuing growth for small publishers, this study was designed to answer questions related to the availability of reviews and library holdings of small press books. The investigators took a random sample of 1980 books from Small Press Record of Books in Print, searched for reviews of the books in three indexes, and consulted the OCLC database for holdings records. The data collected indicate that (1) almost half of the books received one or more reviews, (2) a small core of journals accounted for the majority of reviews, and (3) a significant relationship existed between the number of reviews a book received and the number of libraries owning that book. The findings suggest that information on the books of small publishers is more readily available than has been assumed.

THE GROWTH OF small publishing in the United States during the last two decades has been phenomenal, and industry analysts foresee continued expansion.¹ Though numerous small houses still stress poetry and fiction, others have developed specialties in nonliterary categories. This specialization combined with effective consumer marketing, cooperative arrangements, receptiveness to new technology, limited press runs, and an emphasis on backlist and midlist titles has brought success to many small publishers at a time when some large trade houses face severe financial problems. After years of neglect, small publishers are now considered "more market-oriented, less subjective, far more business-like, and far less wasteful"² than their mainstream colleagues, and their healthy state is reflected in the increased attention they receive in industry journals, at publishers' conventions, in bookstores.

With a few notable exceptions, librarians, as well as large publishers, booksellers, and industry statisticians, have traditionally bypassed small presses. Many librarians assume that small press books are rarely reviewed, seldom stocked by dealers, infrequently found in online cataloging systems and that consequently the uncertainties and difficulties of acquiring them are obstacles that cannot be surmounted by libraries

Judith Serebnick is Assistant Professor, School of Library and Information Science, Indiana University, Bloomington; John Cullars is Bibliographer for the Humanities, University Library, University of Illinois at Chicago.

with limited funds and staff. The lack of quantitative research in this area militates against confirmation or rejection of our traditionally held assumptions.

This exploratory study is aimed at answering a number of questions related to access to information about the books of small publishers. Specifically, the investigators asked: Are the books of small publishers reviewed? If so, how frequently are they reviewed? Is there a core of journals responsible for the majority of reviews? Is there a core of publishers whose books receive the majority of reviews? Is there a significant relationship between the number of reviews a book receives and the number of libraries owning that book?

For librarians who use reviews as one important source in making selection decisions, it seems useful to know about the availability of reviews of books of small publishers. Though we tend to assume that the books of large trade houses and university presses are frequently reviewed, and that small press books are seldom reviewed, actually only a few surveys report estimates of the number of books reviewed in the United States—and the data vary. For example, a 1975 survey found that fewer than 10 percent of the books published in this country each year are reviewed.³ A later survey (1978), limited to nonjuvenile nonfiction dealing with some aspect of sex, concluded that 64 percent of 602 titles published 1972-74 were reviewed in at least one of six major library review journals.⁴ In a 1979 survey of 944 publishers by the Committee of Small Magazine Editors and Publishers, 39 percent (366) of the publishers who responded indicated they had been reviewed in the standard library press, a quarter (238) did not know, and a third (318) said they had not.⁵ Significantly, 42 percent (396) noted that at least one of their publications had been reviewed in small press journals.

We generally assume that since many librarians use a variety of reviews for selection, books with a higher number of reviews have a greater probability of coming to the attention of more librarians and thus of being purchased. Still, limited quantitative research is available to support this assumption. Also, research in this area has tended to focus on public libraries where reviews are heavily consulted for selection decisions.⁶ As expected, this research has found that books and films receiving more reviews are owned in significantly more libraries than are books and films receiving fewer. An objective of this investigation is to determine if a similar pattern holds for the books of small publishers—which have not figured prominently in earlier studies—and for academic and special libraries as well as public libraries.

METHODOLOGY

The first problem in this investigation was one of definition. Currently, there is no consensus on a definition of *small publisher* or *small press*. *Alternative publishers*, described as “non-standard, non-establishment groups or individuals,”⁷ are often classified with small presses. Also, *independent presses*, those “lacking substantial capital” and specializing in “the publication of materials that commercial publishers reject,”⁸ are usually grouped with small publishers. In the extensive 1982 *Publishers*

Weekly special report on small publishers, Appelbaum confirms that defining small publishers in operational terms is difficult: "Some authorities suggest focusing on annual sales, with \$3 million as a ceiling; some suggest titles per year as a criterion, with top limits in the 20-25 range; and some believe the hallmark of the small publisher is a state of mind, a desire to initiate and orchestrate the process that connects writers to readers."⁹

For the purposes of this study, small publishers are defined operationally as those publishers included in an appropriate edition of *Small Press Record of Books in Print (SPRBP)*, edited by Len Fulton and Ellen Ferber, recognized authorities on small publishers. The 1981-82 edition of *SPRBP*, used as the resource for this study, includes more than 1,800 small publishers and some 14,750 individual listings of books, pamphlets, broadsides, posters, and poem-cards.¹⁰ Surely, one can argue that thousands of small publishers are not represented in *SPRBP* (e.g., the 1983 edition of *Book Publishers Directory* includes more than 7,000 publishers, most of whom could be considered small publishers).¹¹ Still, *SPRBP* does include a sizable number of active publishers generally accepted as small publishers, and for the purposes of this investigation, it is the only source including adequate information in a suitable format.

"With a few notable exceptions, librarians, as well as large publishers, booksellers, and industry statisticians, have traditionally bypassed small presses."

The decision was made (1) to take a random sample of new non-juvenile books published in 1980 in English, hardcover and paperback, each over \$2.50, from the 1981-82 *SPRBP*, (2) to search for reviews of those books in appropriate indexes, and (3) to consult the OCLC database for records of holdings in libraries. The investigation was conducted in the Indiana University Library, Bloomington, during the spring of 1983, and was limited to three indexes and the online cataloging system and other sources available in that library. By selecting 1980 books for study, the investigators assumed that their sample would be fairly recent, while the compilers of the indexes would have had the time to include late as well as early reviews.

The indexes searched for review citations were *Book Review Index*,¹² *Current Book Review Citations*,¹³ and *Alternative Press Index*,¹⁴ and each was searched through 1982 issues. The three indexes consulted offer access to review citations in approximately 1,490 journals, including scholarly, popular, specialized, and alternative journals. In addition to indexing the regular review sections of journals (e.g., "Book Review" in *Library Journal*), *Book Review Index* also indexes special review articles and bibliographic essays (e.g., "LJ's Small Press Roundup").

In using OCLC as a database for holdings information, the study is limited to member libraries, totaling almost 3,300 (based on March 31, 1983, statistics).¹⁵ Approximately 51 percent (1,687) are college and uni-

versity libraries, 17 percent (548) are public libraries, 17 percent are special or corporate libraries (548), and 11 percent (376) are federal government libraries. The remaining 4 percent are library school libraries (54), state government libraries (37), and secondary school systems and school libraries (45). Though this study is limited to OCLC members, and thus only an approximate measure of all library holdings, still use of OCLC did provide holdings information on a wide variety of libraries. Given the varied output of small publishers and this study's objective of analyzing holdings in academic and special libraries as well as public libraries, OCLC holdings data on a diversity of libraries with differing collection strengths seemed advantageous.

In order to determine an appropriate sample size of books that would allow for an acceptable margin of error, a random sample of 50 titles of 1980 books was drawn from *SPRBP*, using random number tables to specify page and item numbers. After checking the three indexes for reviews, the investigators determined that 40 percent of the books (20) had received one or more reviews and 60 percent (30) had not been reviewed in the journals indexed. Accepting a confidence level of 95 percent with a tolerable amount of error no greater than plus or minus 0.06, the investigators needed a random sample of at least 188 books from *SPRBP*.

Shortly into the study, an unforeseen difficulty arose. The data in *SPRBP* were in some cases insufficient, inaccurate, or unverifiable. For example, some books given a 1980 publication date were 1979 or 1981 publications, and a goodly number were reprints. All such titles were eliminated from the sample. In addition, when the investigators were unable to confirm bibliographic data for a number of books in OCLC, the *National Union Catalog*, or the *American Book Publishing Record*, those books were also eliminated from further consideration, though a count was kept of the number of titles thus discarded. Bibliographic data for 87 percent of the books were verified in OCLC. Less than 13 percent of the titles was eliminated for lack of verification.

In all, a random sample of 327 books was drawn from *SPRBP*, resulting in a usable sample of 214 books. The 214 books were issued by 150 small publishers. One hundred thirty-one publishers, or approximately 87 percent, are United States firms; 14, or 9 percent, are Canadian; and 5, or 3 percent, are British. (The coverage in *SPRBP* is worldwide, though almost all the works listed are in English.) Among the U.S. publishers, 30 percent are centered in California, 15 percent in New York, 7 percent in Massachusetts, 6 percent in Ohio, and the remaining 42 percent in 26 states and the District of Columbia. Of the total of 150 publishers, 112 (75 percent) each accounted for only 1 book in the sample of 214 titles; 26 publishers (17 percent) each accounted for 2 books; 9 publishers (6 percent) for 3 books; and 1 publisher each (2 percent) for 4, 6, and 10 books.

Thus a wide diversity of publishers is represented in this study. In addition, the content of the books is diverse: approximately 29 percent are poetry; 10 percent, fiction; 8 percent, belles lettres and criticism; 8 percent, how-to and self-help guides; 8 percent, history; 6 percent, sports and exercise; 6 percent, arts and crafts; 5 percent, ethnic studies; 3 per-

cent, economics and finance; 3 percent, religion; 3 percent, feminism; 2 percent, politics; 2 percent, ecology; 2 percent, science and medicine; 2 percent, energy; 1 percent, gays and lesbians; and less than 1 percent, social issues (e.g., child abuse). Review data and OCLC holdings records were collected for each title.

RESULTS

The analyzed data suggest these answers to questions about the number of reviews for books issued by small publishers. Of the 214 books in the final sample, 101 books, or 47 percent, received at least 1 review. The lower percentage found in the pretest (40 percent) can be explained by the fact that the investigators had not then realized that some publication dates and other bibliographic details in *SPRBP* are inaccurate. Thus, for a number of titles in the pretest, the search of review indexes was ineffective. On the other hand, the elimination from the final sample of titles that could not be verified through OCLC, the *National Union Catalog*, or *American Book Publishing Record* may have introduced a bias that would tend to exaggerate the percentage of small press titles that were reviewed. Titles not contained in these three standard sources would be more obscure than most small press titles and consequently less likely to be reviewed. Still, less than 13 percent of the titles were eliminated for lack of verification and possibly a number of those titles were reprints, books with the wrong date, or nonexistent works. To include nonverified titles in the final sample might have introduced a bias in the opposite direction.

The books receiving reviews were issued by 81 small publishers: 79 percent had 1 book reviewed; 19 percent, 2 books; and 2 percent, 3 books. Consequently, no small core of publishers accounted for a majority of titles reviewed.

Table 1 displays information on the number of reviews received by the 214 books. The data indicate that 20 percent of small press books received only 1 review; 11 percent received 2 reviews; 9 percent, 3 reviews; 3 percent, 4 reviews; and 4 percent, 5-15 reviews.

Which journals reviewed small publishers' books? Table 2 displays pertinent data, indicating that 89 journals reviewed 1 or more of the 101

TABLE 1
N REVIEWS RECEIVED BY SMALL PUBLISHERS' BOOKS
(N = 214)

N Reviews	N Books
8-15	2 (1%)
7	3 (1%)
6	2 (1%)
5	2 (1%)
4	6 (3%)
3	19 (9%)
2	24 (11%)
1	43 (20%)
0	113 (53%)

books, and the books received a total of 241 reviews. In the table, the 89 journals are ranked in 4 zones, with Zone A including the journals that reviewed the highest number of books and Zone D including journals reviewing the least number of books. The data show, for example, that in Zone B, *Best Sellers* and *Quill & Quire* each reviewed 8 books, accounting for 16 of the 241 reviews.

The data in table 2 are Bradfordian in character, indicating that a small core of journals is responsible for the majority of reviews. Ten journals (11 percent), those in Zones A and B, each reviewed 6–35 books, accounting for 131 reviews, or 54 percent of all reviews. Only 3 journals—*Library Journal*, *Choice*, and *Booklist*—are responsible for almost 29 percent of all reviews. On the other hand 60 journals (67 percent), those in Zone D, each reviewed 1 book, accounting for only 25 percent of all reviews. Still, of the books that received only 1 review, 63 percent were reviewed by journals in Zones A and B.

The four top-ranked journals each publish thousands of reviews annually. Since their output is significantly higher than that of the great majority of journals, there was a higher probability that they would review more books in this study than would other journals. In 1980–82, *Library Journal* averaged 5,700 reviews of nonjuvenile books annually; *Choice*, 6,647 reviews; *Booklist*, 3,225 reviews; and *Publishers Weekly*, 4,420 reviews.¹⁶ In Zone B, *Small Press Review*, *American Book Review*, and *Parnassus: Poetry in Review* are widely known for their attention to small publishers. *Books in Canada* and *Quill & Quire* were especially prominent in reviewing Canadian small publishers, as one would expect. Since the books in this investigation ranged over many subject areas, it is not surprising that most of the top-ranked journals are general in scope, reviewing books in almost all subject disciplines. In Zone C, more of the journals are specialized, and thus one would expect fewer books reviewed in each. It is perhaps significant to note that at least two journals heavily used by librarians, particularly public librarians—*Kirkus Reviews* and the *New York Times Book Review*—reviewed substantially fewer small press books than did *Library Journal*, *Choice*, *Booklist*, and *Publishers Weekly*, the other major library review journals.

Is there a relationship between the number of reviews a small press book receives and the number of libraries owning that book? As noted above, previous research, concerned mainly with books of larger publishers and with major library review media, demonstrated that there is a statistically significant relationship. Those books receiving a higher number of reviews in core journals were owned in significantly more libraries than were books receiving a lower number of reviews. Also, books receiving only one or no reviews were infrequently owned in libraries.

Table 3 displays OCLC holdings data for the 214 books, with data stratified by the number of reviews received. To read the table, note, for example, that 9 books received 5–15 reviews. Of those 9 books, 1 book (11 percent) was held in more than 500 libraries; 1 book (11 percent) in 300–500 libraries, 6 books (67 percent) in 100–299 libraries, and 1 book (11 percent) in 50–99 libraries. Based on percentages, the data show a

TABLE 2
 JOURNALS REVIEWING SMALL PUBLISHERS' BOOKS ($N = 101$)

Zone	N	Names of Journals	N Books Reviewed	N Reviews Received
A	1	<i>Library Journal</i>	35	35
	1	<i>Choice</i>	18	18
	1	<i>Booklist</i>	16	16
	3 (3%)			69 (28.6%)
B	1	<i>Publishers Weekly</i>	14	14
	1	<i>Small Press Review</i>	10	10
	1	<i>Books in Canada</i>	9	9
	2	<i>Best Sellers, Quill & Quire</i>	8	16
	1	<i>American Book Review</i>	7	7
	1	<i>Parnassus: Poetry in Review</i>	6	6
	7 (8%)			62 (25.7%)
C	1	<i>Kirkus Reviews</i>	5	5
	1	<i>American Reference Books Annual</i>	4	4
	7	<i>Christian Science Monitor, Librarians' Browser, Ms, School Library Journal, Stony Hills, Times Literary Supplement, Virginia Quarterly Review</i>	3	21
	10	<i>American West, Canadian Forum, Christian Century, New Women's Times, New York Times Book Review, Science Books & Films, Science Fiction Review, Western American Literature, Wilson Library Bulletin, World Literature Today</i>	2	20
	19 (21%)			50 (20.8%)
D	60	[60 journals each reviewing 1 book only]		60
	60 (67%)			60 (24.9%)

Note: Percentage totals do not all equal 100% due to rounding.

TABLE 3
 OCLC HOLDINGS OF BOOKS STRATIFIED BY N REVIEWS (N = 214)

N Reviews	N Libraries									
	Over 500	300-500	100-299	50-99	40-49	30-39	20-29	10-19	1-9	0
5-15 (n = 9)	1 (11)	1 (11)	6 (67)	1 (11)						
4 (n = 6)		1 (17)	4 (67)					1 (17)		
3 (n = 19)		2 (11)	6 (32)	4 (21)	1 (5)	2 (11)	3 (16)	1 (5)		
2 (n = 24)		1 (4)	3 (13)	8 (33)	1 (4)	1 (4)	2 (8)	3 (13)	5 (21)	
1 (n = 43)			6 (14)	5 (12)	4 (9)	5 (12)	5 (12)	12 (28)	5 (12)	1 (2)
0 (n = 113)			1 (1)	9 (8)	6 (5)	5 (4)	7 (6)	25 (22)	59 (52)	1 (1)

Note: Numbers in parentheses are percentages. Totals do not equal 100% due to rounding.

clear trend, with those books that received a greater number of reviews owned in more libraries. For example, 84 percent of the books with 4 reviews are owned in 100–500 libraries, while only 14 percent of the books with 1 review are owned in 100–500 libraries. On the other hand, only 17 percent of the books with 4 reviews are owned in fewer than 20 libraries, but 42 percent of the books with 1 review are owned in fewer than 20 libraries. Books that received no reviews fared poorly; 53 percent were owned in 9 or fewer libraries. To test whether there is a statistically significant relationship between the number of reviews a book receives and the inclusion of that book in libraries, a correlation coefficient was calculated for the number of reviews received by each of the 214 books and the number of libraries owning the books. The Pearson r is .34, which is significant at better than the .01 level.

“ . . . one can assume that the majority of small publishers’ books are not receiving the multiple reviews necessary to ensure purchase by a large number of libraries.”

To discover what types of libraries were purchasing the small publishers’ books, a random sample of 25 titles (25 percent) was drawn from the population of 101 books with reviews, and specific holdings information on each was gathered. The 25 books are held in 1,481 OCLC member libraries, of which approximately 47 percent are university libraries, 14 percent college libraries, 27 percent public libraries, 2 percent state libraries, and 10 percent cooperative processing centers, regional library systems headquarters, secondary school libraries, special and corporate libraries, and the Library of Congress.

SUMMARY

In this investigation, limited to 214 books selected randomly from the 1981–82 *SPRBP*, at least 1 review was found for 101 books, or 47 percent of the titles. Though it may come as a surprise to some that almost half of the small publishers’ books were reviewed, it is important to emphasize that of those 101 books, 43 received only 1 review and 24 only 2 reviews. Only 9 books received more than 4 reviews. Since this study, as well as previous research, has shown that the number of reviews a book receives is significantly related to the number of libraries owning that book, one can assume that the majority of small publishers’ books are not receiving the multiple reviews necessary to ensure purchase by a large number of libraries. Though this study did not investigate the direction (favorableness) of reviews, since research has shown consistently that the great majority of published reviews are favorable,¹⁷ it is possible to suggest that even if the majority of small publishers’ books had received favorable reviews, the limited number of reviews militated against wide purchase by libraries that use reviews for selection.

This study did not gather data on the selection methods used by

OCLC members. However, the investigators assumed that reviews were surely not the sole criterion for purchase. One can conjecture that doubtless the subject matter of a book, the importance of an author, and the authority of a publisher were factors. For example, the book with the highest number of holdings in this study is not only a widely and favorably reviewed title, but it is also about the evolution of solar architecture and technology. Another book with large holdings is by Henry Miller, and it was published by Capra Press. On the other hand, a book that received only 1 review, in *Social Work*, but is concerned with child abuse, is also held in hundreds of libraries. In addition, a number of poetry and fiction titles were infrequently held despite 3 or more reviews.

The investigation identified a small core of 10 journals (11 percent) responsible for 131 reviews, or 54 percent of all reviews. The 3 top-ranked journals published 29 percent of the reviews. The 4 top-ranked journals each publish approximately 3,200–6,650 reviews annually, and it is not unexpected to find that they had the space to review more small press books than did other journals. *Library Journal* reviewed almost twice as many books as second-ranked *Choice*, with 37 percent of *Library Journal's* reviews appearing in the annual "LJ's Small Press Roundup."

The findings relate not only to data in previous studies but also to widely held assumptions in the literature. First, the investigators concluded that though they used only 3 sources, it was relatively easy to verify bibliographic data for the great majority of the small press titles. The OCLC database (the first source consulted) provided information for 87 percent of the books; the *National Union Catalog* and the *American Book Publishing Record*, for almost 1 percent. Second, while it is necessary to consult a large number of review journals to obtain reviews of all small press publications, still by consulting a relatively small core of journals one can find a significant number of reviews. Also, of the books receiving only 1 review, 63 percent of the reviews appeared in the more prolific journals. Several of the core journals probably warrant wider use by librarians. Third, though this study did not gather data on the use of reviews by OCLC members, the significant correlation found between the number of reviews a book receives and the inclusion of that book in libraries is further confirmation of findings in previous research, and additional research can have implications for understanding collection overlap.

“. . . by consulting a relatively small core of journals one can find a significant number of reviews.”

At a time when the books of small publishers are reaching a large, receptive consumer audience, often through direct mail marketing by the publishers, librarians also need to become more familiar with the publishers' lists and with additional review sources. This study suggests that the process of gaining greater familiarity should not be as difficult as has been assumed.

REFERENCES

1. Judith Appelbaum, "Small Publisher Power: New Perspectives on the Big Publishing Picture," *Publishers Weekly* 222:23-51 (Sept. 10, 1982).
2. John P. Dessauer, "The Uses of Adversity," *Publishers Weekly* 222:32-38 (Dec. 17, 1982).
3. Sandra K. Paul and C. A. Nemeyer, "Book Marketing and Selection: Selected Findings from the Current AAP/ALA Study," *Publishers Weekly* 207:42-45 (June 16, 1975).
4. Judith Serebnick, "Book Reviews and the Selection of Potentially Controversial Books in Public Libraries," *Library Quarterly* 51:390-409 (Oct. 1981).
5. Daniel Tsang, "Alternative and Small Publishers View Librarians: An Empirical Study," *Alternative Materials in Libraries*, ed. James P. Danky and Elliott Shore (Metuchen, N.J.: Scarecrow, 1982), p.117.
6. For example, see Kenneth S. Tisdell, "Staff Reviewing in Library Book Selection," in LeRoy C. Merritt, Martha Boaz, and Kenneth S. Tisdell, eds., *Reviews in Library Book Selection* (Detroit: Wayne State Univ. Pr., 1958), p.133-78; or Joseph William Palmer, "Influence of Published Reviews of 16mm Motion Pictures on Film Selection in Public Libraries with Large Film Collections" (Ph.D. dissertation, Univ. of Southern California, 1973); or Serebnick, "Book Reviews."
7. James P. Danky, "The Acquisition of Alternative Materials," in *Alternative Materials in Libraries* (see ref. 5), p.13.
8. Bill Henderson, "Independent Publishing: Today and Yesterday," *Annals of the American Academy of Political and Social Sciences* 421:93-105 (Sept. 1975).
9. Appelbaum, "Small Publisher Power," p.24.
10. *Small Press Record of Books in Print 1981-82*, 10th ed., ed. Len Fulton and Ellen Ferber (Paradise, Calif.: Dustbooks, 1981).
11. *Book Publishers Directory: A Guide to New and Established, Private and Special Interest, Avant-Garde and Alternative, Organization and Association, Government and Institution Presses*, 4th ed., ed. Linda S. Hubbard (Detroit: Gale, 1983).
12. *Book Review Index*, 1980-1982 (Detroit: Gale, 1980-83).
13. *Current Book Review Citations*, 1980-1982 (New York: Wilson, 1980-83).
14. *Alternative Press Index: An Index to Alternative and Radical Literature*, Jan./Mar. 1980-July/Sept. 1982 (Baltimore: Alternative Press Center, 1981-82).
15. *OCLC Participating Libraries as of 1983 March 31*, memorandum to Network Directors and Service Center Directors from Thompson M. Little, dated May 27, 1983.
16. *Bowker Annual of Library & Book Trade Information*, 27th ed., ed. Joanne O'Hare and Betty Sun (New York: Bowker, 1982), p.414; 28th ed., ed. Joanne O'Hare (New York: Bowker, 1983), p.405.
17. For example, see G. A. Marco, "An Appraisal of Favorability in Current Book Reviewing," University of Illinois Graduate School of Library Science *Occasional Papers*, 57: 1-20 (Dec. 1959); or Judith Serebnick, "The Relationship between Book Reviews and the Inclusion of Potentially Controversial Books in Public Libraries" (Ph.D. dissertation, Rutgers Univ., 1978).

Book Production Quality: A Librarian's View; or, The Self-Destructing Library

Paul H. Mosher

THIS STATEMENT IS ENTITLED "a librarian's view"—indefinite article, singular—because the results of a survey suggest that most librarians may not consider book production quality a problem at all. The Association of American Publishers/Resources and Technical Services Division Joint Committee in 1982 conducted a survey of one thousand librarians.¹ Only one-fifth of the librarians surveyed about book production quality responded to the questionnaire. Of those who did respond, 46 percent said they were generally dissatisfied with book production quality during the last century. However, 56 percent of the respondents said they would not find useful a symbol printed in books indicating whether or not they were printed on acid-free paper; and 69 percent said that use of acid-free paper was not important to their libraries. These results suggest that problems of preservation and conservation are unimportant to many librarians. But whatever may be the opinions of those 69 percent of the few librarians who bothered to respond to the survey, I have no doubt that the use of acid-free paper in book publication is not only important to libraries *and librarians*, but vital. The durability of the books they buy is, or ought to be, of concern to all libraries; most librarians have experienced chagrin and frustration when a much-used, often-circulated book falls apart, and must be replaced or restored. The life expectancy of books is vital to all libraries with a research component—those libraries that presume to store a portion of recorded knowledge and information for use by future generations.

I was asked to address in this paper the impact of book production standards on libraries, but that request contains an unfortunate paradox: since book production standards do not exist, they can have no impact on libraries.

I can also say without equivocation that the impact of current book production malpractice on the thousands of libraries in the world that

Edited version of a paper presented on July 12, 1982, at the RTSD/AAP Joint Committee program, "The Physical Quality of the Books Libraries Buy: Problems and Solutions," by Paul H. Mosher, Director of Collection Development, Stanford University Libraries.

presume to preserve for our children or our children's children some part of the present and past knowledge of the world is absolutely devastating. To quote from the final report on book paper of the Council on Library Resources Committee on Production Guidelines for Book Longevity:

In the past few years there has been increasing awareness that millions of books and other documents all over the world are disintegrating. We are in danger of losing more than a century of the human record—since the early 19th Century when paper manufacturers began the widespread use of processes that left acidic residues in paper. Such residues in the presence of light, heat, moisture and air hasten the process of deterioration of the cellulose fiber, thus weakening the paper. For example, over six million volumes in the Library of Congress are now so brittle that their survival is threatened. Much effort has been expended, with very modest success, to devise economical ways of preserving these books. Much more needs to be done.

Our concern here is not preserving books of the past, but rather those of the future. Books containing the acidic seeds of their own destruction continue to be produced by the millions, storing up problems for the future, failing to provide a permanent record of our own times.

The impact on many of our research libraries is staggering. While new techniques of gaseous deacidification promise means of halting the self-destruction of the books in our libraries, even this process merely stops the internal fire in place, and cannot rectify damage already done. Peter Sparks has estimated that gaseous deacidification may eventually cost as little as \$5 a book. This estimate means that the Library of Congress' problem may cost them as *little* as \$60 million in 1982 dollars. This figure is calculated by taking the \$5 per book figure estimated by Sparks and adding another \$5 (probably a very conservative figure) for finding the books, physically removing them from the stack, sending them to the deacidification point, bringing the books back, returning them to the shelves, and so forth. Columbia University has previously estimated the cost of dealing with book disintegration in the Columbia University Libraries at about \$35 million. Even in the gentle climate of the San Francisco Bay Area, we have found that about a quarter of the five million books at Stanford have become so embrittled that under ideal circumstances we would no longer allow readers to consult them until some sort of preservative action could be taken. For us, the problem is significantly smaller than it is for some of our sister libraries in the East, where atmospheric conditions are so much more gruesome. At Stanford, the cost of deacidifying the books in serious condition would probably cost only about as much as the entire consolidated budget of our university libraries for a single year. Problems with binding presently cost additional large sums, and if all books with dilapidated or decaying bindings were repaired, the cost would probably add another 20 percent to the cost of deacidifying the paper.

While the present problem appears so large as to be almost incomprehensible, it is only the tip of the iceberg of preservation needs. If 25 percent (1.25 million) of the books at Stanford are currently in seriously embrittled condition, what about the remaining 75 percent (3.75 million)?

Each year we receive and process about 125,000 books; that figure has held constant for some time, and we are doing what we can to maintain that purchasing level—a clear benefit to the publishing industry. But how many books that we acquired in 1950 will be on the disaster list in the year 2000? How many published in the year 1984 will be well on their way to disintegration by that time? How much money that libraries currently spend on the purchase of books will they instead have to divert to preservation? Are publishers aware that their failure to produce durable books for libraries will have an adverse effect on future acquisitions budgets?

Here are some truly monumental dilemmas. The problem is so great, so costly, and so complex to deal with, that as yet the libraries with real conservation or preservation programs and budgets are only making little scratches in the surface of the mountain of the problem. The very vastness and incomprehensibility of the issue tends to make us want to forget about it, to shelve it, to put it away, to relegate it to the remote storage facility of history. In fact, libraries may be so preoccupied with trying to comprehend the problem and deal with it that they haven't got time to complete surveys such as the one mentioned above. It's like dealing with world hunger, with the cruelty of dictatorial governments, with pogroms, or nuclear holocaust. How much of the response of the 69 percent really meant: "We can't deal with it, we can't afford to deal with it, please somebody do something about it"?

Perhaps I can put our problem into a more reasonable form by transforming it into a proposal: It seems to me that librarians could justifiably claim that publishers force libraries to do publishers' work for them at very high cost when publishers supply poorly bound books printed on acidic paper. The expense to libraries of binding, rebinding, deacidification, and replacement of all their decaying books is indeed staggering. If librarians don't ask publishers to pay the retrospective expense of preserving the mountains of acidified books that are their bequest to libraries, why can they not ask—demand—that in the future this legacy of decay be reversed by publishers' providing libraries with the opportunity to buy books printed on durable paper and bound durably at cost plus a reasonable profit?

It is unlikely that even the loudest and most anguished cry from the combined throats of all librarians who worry about the problem will be heard anywhere but in the board rooms of university presses and a small number of other publishers whose largest audience is libraries.

How then can we deal with the prospective situation, with the future of our libraries' collections, with the capacity of our grandchildren or great-grandchildren to learn about the world of our own time, to appreciate the books, novels, and stories, the works of scholarship that characterize the "age of acidification"?

Sure, we'd like cake. We'd like subsidies from publishers to help us with retrospective preservation—even a token amount would mean a great deal, especially if focused on the slowly shaping cooperative efforts of consortia to find common and shared solutions to the vast problems of retrospective preservation—those, for example, encouraged by the

Council on Library Resources. We would love to have consistent, uniformly enforced standards that would provide those libraries that want them with durably printed and bound books—books printed on the alkaline or neutral papers that are usually but inconsistently available to printers—paper which costs no more than the groundwood paper that has created our “self-destructing libraries.” Indeed, we would champion standards forcing the use of long-life paper and really durable binding. We would join Herb Bailey in wondering, as he did in his 1977 Bowker Memorial Lecture, if we may not need a law that would require publishers to print on the title page of each acid-impregnated book they produce: “The Librarian of Congress has determined that this book may be dangerous to your library, or more simply, ‘This book has acidosis.’”³ *But*, and let me underscore this, we’ll settle for guidelines!

What good is a standard if no one will follow it? The conglomerates that own the largest trade-book publishers run them by the bottom line, as Thomas Whiteside so effectively pointed out in his powerful recent series in *The New Yorker*.⁴ Libraries—especially ones with research components—just aren’t numerous enough to carry any real weight with the “big guys.” They aren’t going to follow standards; they aren’t going to buy standards; but they might increasingly follow responsible guidelines. Let us join together as librarians in supporting the two guidelines on book paper and binding prepared and published by the Council on Library Resources Committee on Production Guidelines for Book Longevity.⁵

These guidelines call for paper manufacturers to produce and stock the relatively small amounts of alkaline or neutral book papers that would be required by publishers, and ask that publishers use these papers to print hardback books for which libraries would be a significant part of the audience. They also ask publishers to be sure that the text block of a book is properly sewn or glued and to provide strong hinges. These few steps alone, if regularly followed by publishers, would make an enormous difference; bibliographic Armageddon can be avoided, in other words, simply by consistent application of relatively few reforms. I would be remiss if I failed to observe that these steps are already being taken by a number of responsible publishers—why not the rest? I recommend that RTSD and ALA endorse these guidelines and urge the printing, paper, and binding industries to follow them to the greatest possible extent. They are practical, reasonable, responsible, and would go a long way to achieving our ends.

Alternately, publishers of trade or scholarly books could without great difficulty assess the library market for books printed on long-life paper with durable binding and produce runs thereof, charging cost and a reasonable profit. Certainly, many of my colleagues and I would rather pay a somewhat higher initial cost for a book knowing that it would last a few hundred years, rather than have to pay the inflated later cost of reprints, if available, or more likely, the high costs of labor and treatment involved in removing books from the shelves, deacidifying them, and re-binding them.

If we can’t have the cake, how about at least a reasonable amount of

good whole-grain bread? Let us call upon publishers not to continue to force libraries to bear a large portion of their responsibilities in producing for a known academic or research library market self-destructing books for which the libraries and their parent institutions or funding agencies must pick up the enormous added cost of preservation and conservation. The capital involved to provide the investments required by the guidelines may be recoverable in the long run. Production of groundwood paper produces acids in the processes of manufacture, and acid is also generated during the process of printing on it. The life of such equipment may be lengthened by switching to neutral pH or slight alkalinity. And the cost of acid-free paper need not be more expensive than acidic paper of the same quality.⁶

The medical profession has learned that the costs of preventive medicine—both in money and in suffering—are vastly lower than the costs of illness. Is not the present situation analogous?

Maybe we'd like standards and subsidies, but we'll settle for guidelines if they're followed. If the durable paperback is an unreal expectation, let's at least have reasonable availability of durably produced books in hardback format. Estimate the market and let the marketplace determine the price of the books and the success of the program. It's up to librarians, individually and collectively, to educate and persuade our less-aware colleagues of the perils of our present course, and to publicize and teach not only *retrospective* preservation, but to emphasize *prospective* preservation as well.

REFERENCES

1. AAP/RTSD Joint Committee, "Results of Survey of 1000 Librarians on Book Production Quality" (June 1982). Unpublished tabulation available from the Joint Committee, care of the Resources and Technical Services Division, American Library Assn., 50 E. Huron St., Chicago, IL 60611.
2. Council on Library Resources Committee on Production Guidelines for Book Longevity, "Making Books That Last," Interim Report on Book Paper, *Publishers Weekly* 219:19 (May 29, 1981).
3. Herbert S. Bailey, Jr., "The Traditional Book in the Electronic Age," *Publishers Weekly* 212:24-29 (Dec. 5, 1977).
4. Thomas Whiteside, "The Blockbuster Complex," published in three parts, *The New Yorker* 56:48-101 (Sept. 29, 1980); 56:63-146 (Oct. 6, 1980); 56:52-143 (Oct. 13, 1980). For a related argument see Daniel N. Fischel's treatment of the finances of publishing in "Publishing's Bottom Line—1: Dollars . . . or Sense?" *Publishers Weekly* 219:38-40 (May 22, 1981); "Publishing's Bottom Line—2: Publishing Risks and How to Take Them," *Publishers Weekly* 220:34-36 (July 10, 1981); and "Publishing's Bottom Line—3: The Dangers of the 'Portfolio' Approach to Management," *Publishers Weekly* 220:22-24 (Sept. 4, 1981).
5. The most recent full-text published versions of the guidelines for paper and binding are CLR Committee on Production Guidelines for Book Longevity, "Making Books That Last" (see ref. 2); and the preliminary report on bookbinding, "Binding Books to Last," *Publishers Weekly* 222:37-40 (July 2, 1982).
6. Council on Library Resources Committee on Production Guidelines for Book Longevity, "Making Books," p.21.

The Indian National Bibliography— Its Present State and Future Prospects

Joel C. Downing

This description and short history of The Indian National Bibliography concludes with proposals for its future prepared after a study by the author undertaken at the request of the government of India.

IN 1982, as a retired member of the staff of the *British National Bibliography*, I was invited by the Indian government to visit India and advise on the reorganisation of *The Indian National Bibliography (INB)*. The visit took place during November—a very pleasant month in which to spend some time in Delhi, even in the moister and hotter climate of Calcutta, where *The Indian National Bibliography* is located within the National Library.

The Indian National Bibliography has been in existence since 1958, when from then until 1963 it was published annually with interim quarterly issues. During the succeeding four years the frequency of the interim issues was increased to monthly. Much of the energy and initiative during these early years stemmed from the inspiration of the then national librarian, B. S. Kesavan, who also held the post of editor of *INB* until his retirement in 1963. However, from 1968 until 1970 neither annual volumes nor interim issues were published, though the material for these years is still available in the *INB* offices. Annual volumes and interim issues for the years 1971 to 1976 and interim issues for 1977 have appeared, though after an interval which has made them more of historic than practical value. In 1978 the monthly issues were suspended in order to concentrate upon the production of the delayed annual volumes.

Since 1970 the post of editor of *INB* has been detached from that of the national librarian and has been established as a grade within the structure of the Central Reference Library—an institution eventually to be set up in Delhi, as distinct from the National Library in Calcutta. Unfortunately such expectations have not yet come about, and *INB* is still the only operative element of this potential central reference library. This means that the editor and his staff do not form part of the hierarchy of the

Joel C. Downing, before his retirement in 1981, served as Director of Copyright and English Language Services, Bibliographic Services Division, The British Library.

National Library, nor does the editor have professional contact at a higher professional level.

At the time of the present study two annual volumes, those for 1977 and 1978, were being prepared at government presses in Calcutta and Bombay. Composition of the text is particularly difficult, for entries in *INB* are for books in fourteen languages recognised by the Constitution of India, including Hindi, Bengali, Malayalam, Tamil, Urdu, and others, besides English. No one press could be found in 1958, or even at the present time, with the capability of setting material in the different scripts representing those languages. Consequently the original designers of *INB* decided to romanise entries for those books in nonroman scripts so that all the entries could be understood readily by librarians and others who possessed the ability to read roman script. Such a decision, capable of permitting entries to be arranged in single sequences by subjects, and authors and titles, led to further difficulties, for additional diacritical marks, not available in standard roman founts, are required to differentiate the meanings of words spelt similarly in the different languages. Little of this roman text can be comprehended readily by the Monotype keyboarders employed in setting the text of *INB*, entailing a very slow rate of setting and an equally painstaking correction process on the part of the editorial staff. The use of such a complex typography ensures a cumbrous and time-consuming production operation, which has led to continuous delays in the production of annual volumes, and undoubtedly contributed to the demise of the interim issues.

Since 1958 there has been little or no change in the general format of *INB*, which was based initially upon that of the *British National Bibliography*. Entries in each issue, whether interim or annual, are first arranged in subject order according to the Dewey Decimal Classification, though recent editions have not been adopted. Cataloguing is basically that of the 1949 ALA code. An alphabetical index of authors and titles and an alphabetical subject index are also provided. The languages of the entries in the classified and alphabetical listings are identified by simple language codes. There is no attempt to bring together material in each language into separate sequences. The work of preparing material in the several languages is allocated to specialists, there being fourteen assistant editors, one for each language. They have the support of subeditors for those languages which produce the greatest quantity of material. Since its inception *INB* has been located at the National Library in Calcutta, which itself is housed in the Belvedere, the viceregal lodge of the old capital.

Despite some evidence of operational improvements in recent years, the rate at which this is being accomplished is not significant enough to satisfy the requirements of either librarianship or the book trade, whether at home or abroad. The decision to suspend the monthly issues after that for December 1977 is to be regretted. The impetus created by a regular publication at frequent intervals injects a sense of urgency and deliberate achievement which is impossible to maintain by a cycle of annual publications. While the annual volumes possess a reference value, it is the regularity and currency of the interim issues which determines

the value of a national bibliography of the size of *INB*.

A current national bibliography relies entirely upon the existence of legal deposit laws and their effective operation. In this respect *INB* depends upon the operations within the National Library. The Delivery of Books (Public Libraries) Act, 1954, amended in 1956, requires the deposit by publishers of newly published items at the National Library and other specified institutions. Many Indian publishers are aware of the requirements of these acts and deposit some, if not all, of their publications voluntarily, though not always promptly. Due to the great number of Indian languages, there are, however, publishers that are extremely negligent in deposit, or are unaware of the acts, and whose publications are very difficult to identify. Variations in the deposit of publications seriously affect the currency and comprehensive nature of *INB*, though continued delay in the appearance of *INB* itself does little to encourage vigorous action on the part of the staff of the National Library in pursuit of missing publications. It will be appreciated that only those members of staff capable of reading the different scripts are qualified to undertake such work. Reviews and advertisements in newspapers and journals, together with publishers' catalogues, are the main source of information, but there must be material in some languages that does not achieve such publicity.

Most Indian publishers recognise the purpose of the National Library to act as the depository library for the national archive. They would clearly appreciate improvements in the regular and more frequent appearance of *INB*, which would help in the sale of their products and induce many publishers to deposit promptly and voluntarily, especially their more expensive publications. At present, editions, which are generally small by Western standards, are sold out before records for them appear in *INB*. Despite complaints regarding the number of copies required by the various national and state laws, the greatest area of comment stemmed from the steadily increasing cost of forwarding publications by registered post to the depository libraries. Frequently the cost of postage across the country is greater than the value of the material dispatched.

INB improved in currency and comprehensiveness would clearly stimulate sales to individuals, libraries, and other institutions, as well as disseminate knowledge of the nation's publishing to a worldwide market. There is a considerable interest in Indian studies, particularly in Europe and America. Indian publishers also regret their inability to apply ISBNs to their publications. No agency as yet exists in India to cooperate with the international office in Berlin, or to coordinate activity within the Indian book trade. The lack of such a system in India means that the largest output of books in the English language outside the United States and Great Britain does not benefit from the possibility of automated processing in book shops and publishing houses.

Besides being the third-largest producer of books in English, India is the seventh-largest country in the total number of books published. Nevertheless by the nature of the material produced it must be concerned with the absorption of its production within its own community. The

development by IFLA of its program of universal bibliographic control depends increasingly upon the interchange of machine bibliographic records. India, as yet, is not in a position to develop such services, either internally or internationally. The employment of such systems relies upon stable and viable nonmechanised services for effective development—a condition which has not yet been identified. Such a condition should not necessarily limit research and prospective development, though it does restrict direct application to ongoing services. There is sufficient potential for expansion of library services in India to allow for continued experimentation, particularly to avoid the mistakes that have been made in countries at the forefront of automated bibliographic services. In a nation such as India, with so great a potential for human development—physical, political, and spiritual—a national bibliography, by the range and variety of its content, serves not only as a record for posterity, but as a means of improving the life and aspirations of every member of the living community.

It is essential, therefore, to propose solutions which would lead to the regular and current appearance of *INB*, through the agency of improved methods of production and simplified administrative procedures. With the acquisition of up-to-date phototypesetters being developed by Monotype (India) and located in the offices of *INB*, it should be possible to set and have printed regular monthly issues commencing, it is hoped, in 1984. The present method of production, cumbrous and slow as it is, should be retained to produce annual volumes for 1979 to 1983, the later years being combined two to a volume. The new monthly issues will need to be printed by photo-offset lithography, a process which is not available at the government press near Calcutta. Consequently, steps will need to be taken to find acceptable commercial printers. To ensure a continuous and regular publication it will be necessary to maintain a full complement of staff—a factor which is never easy within an environment of great bureaucracy. Associated publications with which the staff of *INB* have been associated should be given a much lower priority and the resources released should be organised by a stronger management team, assisted by a small professional advisory body meeting at regular intervals.

With all the proposed developments taking place it would be unwise to venture other changes within the publication itself. However, consideration should be given to adopting more recent practices in cataloguing and classification. AACR2 and Dewey decimal classification, 19th edition, should be applied so as to bring *INB* into line with other major national bibliographies. India could then take its place within the councils of ABACUS. Consideration should also be given to the use of ALA romanisation tables, so that at an appropriate point in the future the exchange of machine-readable records would be possible.

It is chastening to visit a country, such as India, to study professional activities with which one has been associated for a working lifetime. Factors such as climate, communications, languages, natural resources, and the variety of cultures at regional and national level constitute problems outside the experience of many Western communities. Yet it is to

be hoped that the study undertaken will lead eventually to the recognition of *The Indian National Bibliography* as one of the world's principal contributors to universal bibliographic control.

No one visiting India can ever forget the charm and hospitality of everyone one meets. The enthusiasm and generosity of the editor and staff of *INB* and the librarians I met was second to none. The care and attention with which one was guided by the staff of the British High Commission, whether at 4:20 a.m. on first arrival at Delhi Airport, or at 2:00 a.m. after a delayed flight from Calcutta, will always be appreciated. *INB* needs the support of librarians and bibliographers everywhere to ensure its improved service in future years.

Considerations in the Creation of a Holdings Record Structure for an Online Catalog

Arnold Hirshon

The record structure used to represent holdings data in an online catalog must be designed so that the data put into the record are suitable for the various types of output to be derived from those data. The library systems maintenance format for holdings data should be organized in a way that is logical for the staff who are creating and maintaining the data. The format should be structured so that it may be manipulated for appropriate output, with the internal organization in the computer being a secondary concern. In this paper the relationships between data input and output are explored, and the record structure for the holdings segment of the Triangle Research Libraries Network online catalog is described briefly.

THE DEVELOPMENT OF automated systems for the representation and manipulation of bibliographic data has generated a number of issues that have received much attention in recent years. With the advent of OCLC, much of the attention was paid to bibliographic descriptions. More recently the focus has been upon authority control.

Only recently has much consideration been given to the machine representation of holdings data. In this regard, *holdings* is broadly defined to include the specific housing location; the call number; size information; the full piece-specific hierarchy and enumeration; the status of the piece; and bibliographic or local notes about specific pieces.

In the past, through work with the ANSI standards for summary and detailed holdings for serials, holdings data were considered in terms of data elements and basic syntax.¹ The ANSI standards speak to the display of the holdings data but not to automated manipulation nor to transfer of those data.

The content designation of holdings data for machine manipulation has to this point been accomplished through nonstandard measures, and

Arnold Hirshon, Assistant Head of the Cataloging Department at Duke University at the time this paper was prepared, is now Associate Director for Technical Services at Virginia Commonwealth University. The holdings record structure, described in this paper, was developed by the TRLN Cataloging Policy Committee, of which the author was a member. He is indebted to Jeanne Sawyer and Barbara Branson for reviewing the manuscript and to Joe Hewitt, TRLN Cataloging Project Coordinator, for his encouragement.

often these have involved the input of data without much regard for their output. OCLC, for example, developed standards for the use of a single holdings field, the 049, using a series of subfields to represent the necessary holdings information, such as the piece hierarchy, missing pieces, and notes. Other than the stamps and holding codes, OCLC never used the data in that field for their own purposes. When others started to apply the data, OCLC added a local option field, the 949, which has been widely used for holdings in local systems and for transaction codes that permit updating.²

Other systems, such as the Washington Library Network and the Research Libraries Group, developed separate records, and the latter employed separate fields for most data instead of a string of subfields.³

Missing from these early development efforts was a thorough understanding of how the holdings data were to be applied in the various library systems. Concentration in system specifications on input led to a compact system of data representation, but one that was inflexible, clumsy, and difficult to apply. Machine representation of serials holdings, therefore, generally was not done in libraries that had to rely upon the 049 field alone.

Calls for greater consideration of the computer-related aspects of holdings data began in 1981, when Tamer Uluakar noted that no standardized system for machine representation of holdings data had been devised, but that many separate schemes were being created. To correct that situation, he called for the creation of a MARC format for holdings data, and he cited three reasons for doing so: (1) to ensure the machine-interpretability of the data to avoid the need for rekeying; (2) to enhance the compatibility of future systems; and (3) to save system development time by making it unnecessary for each system to redevelop its own holdings system.⁴ Similar concern for the need for a MARC format was expressed by Ruth Carter in early 1982.⁵

In 1982, the Southeastern Association of Research Libraries Cooperative Serials Project and the Library of Congress began to develop a format for representing holdings information in machine-readable form.⁶ Drafts were completed and circulated throughout the library community in 1982, and it is expected that a final draft of the MARC format for holdings and location data will be approved and distributed in 1984.⁷

COMMUNICATIONS VERSUS MAINTENANCE FORMATS

The MARC format for holdings data is significantly different in one respect from the MARC formats for bibliographic and authority data. While the latter two standards are "communications formats," they also have been widely applied in systems as the user formats with little modification. This likely will not be the case with the MARC format for holdings. As with the other MARC formats, the holdings format provides a standard means for exchanging data on machine-readable tapes among libraries. Tape systems, which rely upon batch processing, do not have to address the problems created by interactive updating nor ad-

dress the logical structure to enhance the maintenance operations.

The holdings record, however, must be structured in a manner that is most appropriate for the use that will be made of the data. The functional requirements for a library's maintenance format are greater than the communications requirements. The MARC format presents data in such a way that local systems will likely need to augment and reorganize the data to create a local maintenance format that accommodates the various applications of the holdings data.

A maintenance format must accommodate more types of output than a communications format, and it must do so in a way that is hospitable to easy updating. A principle of the MARC format for holdings, for example, is that it should be used to record what a library actually owns, and not to show volumes that are not owned, such as materials on order or materials that have been withdrawn from the collection. This principle was developed after consideration of what types of data *other* libraries might find useful. While it may be arguable as to what information different libraries might find of value, there is agreement that a communications format needs to communicate only information that is of interest outside of the local library setting.

A maintenance format, on the other hand, must accommodate not only what other libraries need to know, but also the needs of the local library. Many of the needs for holdings data place divergent requirements as to what data are to be supplied, and in what form. Some common examples of automated output are statistical reports, printed lists, and online displays. In all areas of library operations, there is need to record and apply holdings data, but in different ways. The requirements for input may change depending on the function to be accomplished. For example, an acquisitions system needs to record the number of copies ordered, while the circulation system needs a record of the specific piece numbers assigned to each physical volume.

Libraries have essentially two types of holdings data: "transactional" and "archival." These admittedly overlap in some respects. Transactional data fix the status and location of each piece of material for a limited period of time; materials on order, in process, or in circulation fit into this category. Archival data reflect the relatively permanent condition of the material, such as whether or not it has been withdrawn from the collection. The MARC format does not need to accommodate transactional data because it is not expected to be of interest for communications purposes. A local maintenance format must include both in support of various applications.

This requirement means that a maintenance format must be amenable to a wider variety of information to be input, that manipulation of the data must be easy to perform, and that the output requirements will be more diverse than for a communications format. Each type of output presents its own requirements, and the most important of these deserve some consideration. While some of the considerations below might also apply to a communications format, the primary applications are within local maintenance.

APPLICATION OF HOLDINGS DATA

RETRIEVAL

Holdings data in an automated environment need to be retrievable both by library staff and users. The holdings record itself may be retrieved by the same methods as the bibliographic record, such as author or title, because the holdings record is paired with its bibliographic record. There also may be, however, *piece-specific* "added entries" that permit greater access to the material and that, by their piece-specific nature, would not be appropriately added to the bibliographic record. In rare book cataloging, for example, it may be useful to have controlled entry retrievability (as opposed to simply keywords) through such access points as type of binding or paper, the name of someone who autographed a specific copy, etc.

The related information to be retrieved as part of the holdings record is also critical. Perhaps the most complex situations for retrieval are not in serial publications per se but in analytics. For example, when a single analytic is retrieved, should the holdings record also reveal the other volumes that are available in that set or series, or should it simply reflect the holdings for that analytic? When there is a set within a series, should both the set and series relationships be covered in the same record, or must the user separately search bibliographic records and retrieve them *seriatim*? While this is actually a bibliographic relationship, the logical construction of the holdings record should permit accurate retrieval of the related and equivalent publications because of the relationship of the bibliographic and the physical pieces.

DISPLAYS

The displays of holdings information are likely to be different for public use and staff use. How the information is to be displayed can have a significant effect on how the data are input. Whether information is entered in coded or in free-text form is a key consideration. Coded data have the advantages of generally being easier to input, saving storage space, and being faster for the computer to access. In addition, coded data are more flexible for future applications. When displays are created based upon coded data, consistent terminology can be assured because the data can be validated for accuracy. Should the library wish to change terminology, the alteration does not require a massive re-editing or conversion of actual data in the record itself. Information, about size for example, might be input simply as free-text data, but if the library changes its definition of *oversize*, retrieval and changing of the affected records are more difficult if the data are not coded.

Piece-specific bibliographic notes should be part of the holdings record because they describe only a specific copy or volume, whereas the bibliographic record describes the entire item. As with the notes in bibliographic records, it is preferable to have different tags for the different types of notes to permit greater flexibility in terms of keyword indexing and accessing.

A display for staff use would show the necessary coding for content

designation, while the public display would either suppress these codes or translate them into terminology that is understandable by the public. The content designation, therefore, must be amenable to this translation, including indication when necessary of whether the information contained in the field is to be suppressed or displayed for the public.

STATISTICS

The generation of statistical data is likely to be a major output from a maintenance record. Information not transmitted in the communications format, such as archival status information showing whether the item is active or withdrawn, needs to be coded into the record. Other data needed for further enumeration of the library's holdings, such as the physical format of the material, must also be present in the record.

The actual piece data, such as copy and volume numbers, must be represented in a manner that makes statistical compilations practical. For example, if the volumes were to be lettered rather than numbered, the data string for the volume enumeration preferably should not be represented as a range (e.g., volumes *A-R*) because this would require the computer to translate letters into numbers. Although such simple ranges of letters may be counted, frequently the letters are names of volumes or roman numerals, which cannot always be counted by a computer.

Another difficulty arises from the representation of volumes and parts as ranges, particularly when there are missing pieces, such as "volumes 1-3, parts 2-6." The numbers given in piece enumeration are the numbers of the specific volumes, not the total number of volumes. In actuality, this enumeration is:

v.1
 pt.2-6
v.2
 pt.2-6
v.3
 pt.2-6

The computer should not be programmed simply to take the highest number of the lowest subpart (pt. 6) and then to multiply this number by the highest number given at the highest level in the piece hierarchy (v. 3). The result in this case would be to multiply six times three. In reality the physical volume count is not eighteen but fifteen, as is easily ascertained when the holdings for each volume are represented separately. If the holdings were not represented separately, computer programming obviously would be further complicated if the highest level were represented by a range, with the lower level having a combination of ranges and gaps, such as v.1-3, pt.2-6, 8.

PRINTED PRODUCTS

Printed lists and other products, such as spine labels, may require that the data be input in a certain format or in a flexible coded manner to allow for proper manipulation. For spine labels, if the location has been treated as free-text rather than coded data, and if that free-text informa-

tion is too wide to print on a spine label, the necessary adjustments will be difficult to make. If the data have been coded, however, a programmed table could instruct the computer which location name to supply in which circumstances; while the online display might show "Chemistry," the printed labels or printed lists might show only "Chem."

GENERAL STRUCTURE FOR HOLDINGS RECORDS: A METHODOLOGY

As noted earlier, the MARC format for holdings and locations provides a framework for communication of holdings information, but it does not provide a maintenance format. The Triangle Research Libraries Network (TRLN), whose members are Duke University, North Carolina State University, and the University of North Carolina at Chapel Hill, has developed a maintenance format for holdings as part of a joint development of an online catalog. This project has been funded by a grant under the Higher Education Act Title II-C program. All three members of TRLN use OCLC for cataloging support.

In 1979, agreement was reached by the three libraries on a uniform syntax for the entry of holdings data into the OCLC holdings field. Agreement was reached later on the use of transaction codes to make it easier to update OCLC records.

Although work on the TRLN format began before the MARC format had been developed, the format is compatible with the MARC format in that the data can be restructured to meet the MARC specifications. The format provides content designation that allows for the input and storage of detailed holdings data for all formats of materials. It also provides a uniform syntax for the enumeration of copies, volumes, part, etc.

GOALS

The first of the goals set for the TRLN format was that the general structure be designed and expressed as a *logical*, or conceptual, structure without regard to the physical structuring of the data within the computer. This decision not only freed the planners from unnecessary concern with systems design, but it also permitted them to consider the problems from the library perspective and to look at the inputs and the outputs rather than the processes.

The format was to provide archival data for detailed holdings both for items held and items withdrawn from the collection. The holdings record was to support both the immediate functions of the online catalog and the other anticipated library functions needing archival data. Transactional data were not a direct concern during development because the emphasis of system development was on the online catalog. Consideration was given, however, to possible additional data that might be needed for such purposes as circulation or check-in, and the record design was to be flexible enough to incorporate these types of data, as additional systems components were completed.

Some of the immediate online catalog functions to be served by the archival data were the following: to display holdings information for

both general library users and staff; to replace the traditional shelflist; to verify new call numbers and avoid assignment of duplicate numbers to different titles; to exchange data with other libraries or organizations for specified categories of materials; to keep statistical records; and to produce spine labels.

Some of the *non*-online catalog functions, not directly addressed in the development of the TRLN format, that required some archival data were the circulation of material, the recording of monographs and serials received on standing order, including the automatic claiming of materials, and the binding control.

Another goal was to create a data structure that would provide for maximum flexibility in the creation, maintenance, and application of the data. The record structure was to be comprehensive and similar in approach to the MARC formats used in the bibliographic and authority components in the system.

PAIRINGS OF HOLDINGS AND BIBLIOGRAPHIC RECORDS

The TRLN format is based on some underlying principles about the logical structure. The holdings description itself would not contain summary data but would be piece-specific, or detailed. To display the holdings of all physical and bibliographic units efficiently, all housing locations within an institution were to be represented within a single holdings record; therefore, the most important consideration was that the holdings record should be arranged hierarchically. Allowance was made for the inclusion of relevant information associated with a field at any level of the hierarchy.

A corollary principle was that each physical piece should generally be represented logically in only one holdings record. For an item represented by multiple bibliographic records, such as an analytic for a set or a series, the holdings record would be associated primarily with the bibliographic record that stood highest in the bibliographic hierarchy. Further, when there were multiple records for an item, all appropriate bibliographic records would be linked. This logical structure was independent of the actual physical storage in the computer. This approach was found most satisfactory by the library staff responsible for maintaining the data because it would be the easiest to understand and the most efficient in terms of data maintenance.

The translation of these principles into specifications resulted in only one holdings record for each bibliographic entity in general. Where a physical volume has multiple bibliographic relationships, a *collective* holdings record is created. For example, in the case of a physical volume that is part of both a set and a series, there may be a bibliographic record for the series as a whole, for the set as a whole, and for the specific analytic. The analytic has an added entry for both the series and set. The holdings record is created at the most inclusive bibliographic level, which is the series. Therefore, for multiple copies of the analytic, or multiple volumes in the set, this information would be represented only in the series holdings record. This procedure would be followed for analyt-

ics, whether the series is classed together or not. This record then carries the bibliographic record identification numbers along with the appropriate volume.

Similarly, for an analyzed set *not* in a series, there would be one collective holdings record for the set, but no separate holdings record for each analytic.

From this collective holdings record, it is possible for the system to extrapolate data from any level of the hierarchy to display holdings data for the user. For example, the user is able to retrieve holdings data for the entire series, just for the set, or just for individual volumes within the set. The bibliographic displays include holdings data based on the level of the bibliographic record retrieved, e. g., if the series record is retrieved, the holdings data for the entire series are displayed, but if the set data are retrieved, only set holdings data are displayed.

The alternative to collective holdings records would be to have separate holdings records attached to the separate bibliographic records, with all bibliographical relationships shown at the lowest level. There is no reason to believe those records would be easier to create or to maintain if linkage across bibliographic levels still needed to be provided. It is likely that the opposite would be true; the cataloger and the user alike would need to consult multiple records rather than just one. In addition, for items that are classified separately, there would not be a single access point that would bring together all of this holdings information into a single collective record. Neither the call number nor the series entry nor the set entry alone accomplishes this purpose. Providing the record structure from the lowest level up, therefore, would be less flexible in terms of access as well as in other applications. Further, to store data only at the lowest level of the hierarchy would likely result in greater overhead in terms of storage, and the compilation of accurate collection growth statistics would be difficult if not impossible.

While the creation of this collective record does place some additional burdens upon the library staff to ensure that all data are correctly entered into the single record for all of the pieces in the hierarchy, the method ultimately is beneficial to the user. Some of the difficulty in creating the collective holdings record and assuring record accuracy can be alleviated by automatic supplying of some data and through record validation techniques. By consolidating all of this information, the user benefits by being able to retrieve a specific item and then find related items by proceeding rapidly up and down through the bibliographic hierarchy.

GENERAL DESCRIPTION OF THE TRLN RECORD STRUCTURE

TRLN holdings records are divided into two parts: the "header" and the "block." The header contains general bibliographic information, both in coded and free-text form, that is title-specific. The block contains copy-specific holdings data.

The basic elements of the header are the record identification number; fixed-length fields for the author and title; the bibliographic level; the classification number used for shelving purposes; the dates that the

record was created and last used; the physical format of the material; and a field to define the "caption data," which are the terms used for volume designation, e.g., "v." The header generally includes the same information for all MARC bibliographic formats except for some additional data fields for serials and manuscripts.

There are two types of fields in the block, and they are distinguished by the type of tagging. Alphabetically tagged fields are used for the piece enumeration, including the library location where the material is housed; the piece enumeration fields for copies, volumes, etc.; accompanying materials; equivalency relationships for pieces of a set within a series; information about the archival status (lost, withdrawn, etc.); the size requirements for shelving, such as oversize; and the physical format of the individual pieces. For consistency with the bibliographic format, numerically tagged fields are used for notes about individual pieces, and alternate or multiple call numbers for different locations. A short explanation of the record structure will be found in the appendix.

COMPOSITION OF THE HEADER

The data elements in the header are necessary either to identify the record or to support one of the essential functions of the holdings record. Some also appear logically as part of the bibliographic record display, but can be edited in only one of the two records. The record identification number (the "rid") is paired with the record identification number of the bibliographic record, which is the OCLC number. Holdings record identification numbers have prefixes: *H* for a simple holdings record, *S* for set analytics, or *C* if it is a "collective" holdings record. The *C* is used when the item is part of a hierarchy, such as a set within a series.

The physical format fixed field contains a locally defined two-character code that is supplied when all pieces represented in the piece enumeration are in the same format. These codes are different from the format designations provided in the MARC 007 field for physical description. The first character is for a general format designation (book, A-V, map, manuscript, machine-readable data file, music, microform, or sound recording); the second character is a specific code for the material, such as sound discs. The codes are, in all cases, at least as specific as the AACR2 general material designator; in some cases, AACR2 specific material designators have been adopted. If the item has pieces in different formats, a code for "multiple" is inserted. There is room for expansion should new formats need to be defined.

The call number field includes classification and book numbers for shelving purposes. The field follows the same content designation conventions as specified in the MARC bibliographic formats. The header field carries the shelving number only when that number is used for all locations in the record. If there are different call numbers for different locations, the header shows "multiple" call numbers, with the call numbers given in the block with each location or piece within a location, as appropriate.

The definition field (DEF) is linked to the tagged piece enumeration fields, and the definition field may occur only once. In the following ex-

ample of a DEF field, the first level field of the piece hierarchy (VOL) is defined as "Bd." and the second level field (PRT, for part) is defined as "Heft."

DEF VOL = Bd. ≠ a PRT = Heft

Allowance is also made for redefinition should the definitions of any of these field values later change.

COMPOSITION OF THE BLOCK

Organization of Data Using Fields versus Subfields. A major issue in developing a maintenance format for holdings is how to best organize the data. There are two basic options for piece enumeration: (1) either a single holdings field that shows the piece hierarchy through subfields, or (2) separate fields for each piece level.

The OCLC and the MARC formats essentially use a single holdings field. In the MARC format, however, the field is repeatable to accommodate changes to the definition of the volume designators. After careful consideration of this option, it was rejected by TRLN, primarily because multiple subfields are complicated and are not flexible enough to accept varying types of input. Further, use of subfields created long text strings acceptable for communications purposes, but not particularly easy to apply in a maintenance format. By separating piece levels into separate fields, it became easier to show information positionally and to provide greater detail in content designation.

As an illustration of the subfielded method, consider as an example an item held in two locations: AAAA and XXXX. Each location has a different call number and its own copy number sequence. There are three levels to the piece hierarchy, with definitions of "Bd.," "Heft.," and "Abt." In location AAAA, Band 2 was signed by the author, a fact to be displayed as a public note; a replacement copy requested for Band 3 is recorded in a note not to be publicly displayed.

The field tag is 049, the location is in subfield a, the copy number is in subfield c, the piece hierarchy is represented in subfields v, p, and q, and missing pieces are noted in subfield m. Notes are in subfield n, and the call number is in a subfield l; both notes and call number subfields are followed by the tag, placed in brackets, and the field data. For notes, within the brackets, an initial character before the tag of a percent sign (%) indicates that the note should be displayed to the general public, and a number sign (#) indicates that the note is not to be supplied. Information also appears in brackets after individual pieces without modification to indicate the piece identification (e.g., bar code) numbers. The method of recording holdings in a single field with subfields is illustrated in the example below.

```
049 AAAA ≠1 [050] BX569.R345 ≠b N72 1973 ≠c 1 ≠d [≠v = Bd. ≠p = Heft
≠q = Abt.] ≠v 1 [0123456789] ≠p 1 ≠q 1 [1234567890] 2 [2345678901]
≠v 2 [3456789012] ≠n [% 500] Signed by the author ≠m 3 [5384950694]
≠n [#500] Replacement ordered ≠v 4 [4567890123]
XXXX ≠1 [050] BX73.G475 ≠b R24 1973 ≠c 1 ≠d [≠v = Bd. ≠p = Heft
≠q = Abt.] ≠v 1 [5678901234] ≠p 1 ≠q 1 [6789012345] 2 [7890123456]
≠v 2 [8901234567] 3 [9012345678] 4 [9876543210]
```

While there are undoubtedly other ways in which this information could be input using subfielding techniques, and this example is *not* purely based upon OCLC conventions, this is a likely solution if depth of content designation is to be preserved. The result, however, is a dense data string where positional information such as notes becomes difficult to insert or to find.

Compare this to the TRLN field-related system. For each field except the definition field, there are three indicators. For purposes of this example, all indicator positions are blank, except that missing pieces are noted in the third indicator with a value of *m* and notes have a third indicator that shows either to display (code: *d*) or not display (code: *n*). Call numbers are shown in tagged fields. The three piece hierarchy levels are VOL, PRT, and SP1 (subpart level 1).

DEF VOL = Bd. ≠ a PRT = Heft ≠ a SP1 = Abt.

```

LOC AAAA
050 BX569.R345 ≠ b N72 1973
COP 1
VOL 1 [0123456789]
PRT 1
SP1 1 [1234567890] 2 [2345678901]
VOL 2 [3456789012]
500 d Signed by the author.
VOL m 3 [5384950694]
500 n Replacement ordered.
VOL 4 [4567890123]
LOC XXXX
050 BX73.G475 ≠ b R24 1973
COP 1
VOL 1 [5678901234]
PRT 1
SP1 1 [6789012345] 2 [7890123456]
VOL 2 [8901234567] 3 [9012345678] 4 [9876543210]
```

Even with this relatively simple case, it is apparent that the use of separate fields makes it simpler to discern different types of information and easier to insert information at different levels of the hierarchy.

Fields and Indicators. All fields in the block have three indicator positions. The indicators in the alphabetically tagged piece enumeration fields provide additional descriptions about the specific pieces. The first two positions describe the physical format of each piece, using the same codes as for the format in the header; these codes appear even if all pieces represented in the record are in the same format. The third position shows the permanent status of the each piece: e.g., active, lost, missing, or withdrawn.

Bibliographic notes employ the same tags as in the bibliographic formats, but only some of the tags have been authorized for use in the holdings record. The first two indicators are the same as in those formats, and the third position indicates under what conditions the note should display.

The call number fields also employ the same tags as defined in the bibliographic formats, with the first two indicators defined accordingly. The third indicator shows whether the call number can be assigned to

more than one physical piece, as with accession numbers that are made unique by the presence of the name of the library location.

General Piece Hierarchy. The piece hierarchy is normally expressed in five fields: LOC (location of the material), COP (copy number), VOL (first piece hierarchy level, normally "volume"), PRT (second piece hierarchy level, normally "part"), and SP# (third and succeeding piece hierarchy subpart levels; the number sign is replaced by an arabic numeral starting with 1 and up to 9). The VOL and PRT fields have default designator values based upon the physical format of the material; for example, the VOL field is automatically defined as "disc" for sound discs.

Subfields provide further information, such as free-text description of a location; coded data used for statistical purposes; format of the material to be displayed with the location and the call number; size information in coded form; coded data for statistical purposes; and coordinate numbering systems, e.g., the volume number and the related years for coverage for serials.

Special Piece Hierarchy. Two special fields have been defined for particular situations. EVL is used when the holdings record is related to two or more bibliographic records. This commonly occurs when an item is a set within a series, and both numbering schemes are to be shown in the record. In this case, the bibliographic hierarchy explained earlier is applied; the series numbering takes precedence over the set or analytic numbers, and therefore the series number appears in the subfield a of the EVL field. Within each EVL field, the set number appears in a subfield, with multiple codes provided for multiple levels of a set hierarchy. The record identification number of the bibliographic record for the analytic is provided in the EVL field as well. If the item is not in a set (and therefore has no set/series equivalencies), the normal VOL field is used. For example, in a series there are five volumes. Volumes 1 and 2 are not in a set; volumes 3, 4, and 5 are in a set, and each volume has its own analytic. Figure 1 is for an item for which there is no cataloging for the set as a whole; i.e., the set is represented only by the analytics. The record identification number of each bibliographic record is preceded by the code "rid."

The entire holdings record appears as follows:

```

LOC  AAAA
VOL  1 ≠r 100
VOL  2 ≠r 200
EVL  3 ≠e 1 ≠r 6074
EVL  4 ≠e 2 ≠r 8013
EVL  5 ≠e 3 ≠r 9016

```

A separate field is used for equivalence situations because this not only permits immediate recognition that the field will contain the additional equivalent numbering data element, but also the presence of the necessary equivalence data elements can then be assured through automated record validation. The field permits collocation of holdings information so the user may determine everything the library owns in the set or series from a single record, rather than having to page through separate biblio-

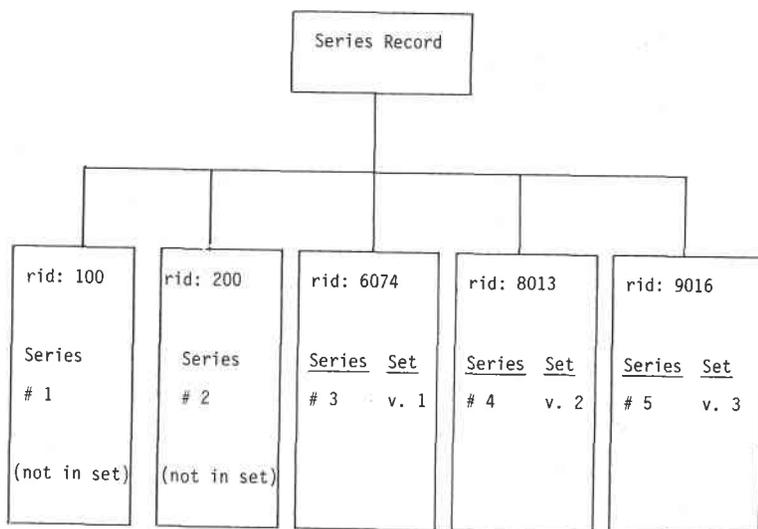


Figure 1
Relationship of Set to Series

graphic and holdings records to obtain this information. In addition, this collocation ensures greater accuracy in the compilation of collection growth statistics by avoiding counting multiple records. This avoids counting one bibliographic record for the set and a second record for the series, when there is actually only one physical piece.

Accompanying Materials. Another special situation in terms of holdings is the treatment of accompanying materials. Accompanying materials present special problems because they may be in different formats from the main work and they may accompany only part of the main work. In the TRLN format, a separate subhierarchy was created. At the copy level, the field is the ACP, down through the hierarchy with AVL, APT, AS#.

It is possible to show which volume is being accompanied by positioning the accompanying material field immediately after the appropriate piece enumeration field. If the accompanying material accompanies the work as a whole, the ACP is given after the COP field and before any other piece enumeration field.

COP 1
ACP 1
VOL 1

If the accompanying material accompanies a specific volume, then the ACP field appears after that volume, part, etc.

COP 1
VOL 1
PRT 1
ACP 1
PRT 2
VOL 2

CONCLUSION

In the design of the TRLN general structure for holdings records, special consideration had to be given to several problems because of the diversity in output and the complexity of the requirements to be satisfied by the products.

- It was necessary to design the record as a logical structure for maintenance rather than a physical structure within the computer. The applications of the data and the needs of the various constituent groups became paramount.

- The record had to be designed to integrate all archival holdings data into a single record, paired fully with multiple bibliographic records. Though the result is a complex record that places demands upon the person preparing the data, it ultimately permits the user greater flexibility in data access. The holdings data might be represented more simply to provide relief for the cataloging staff, but the result would be to misplace the burden of discovering the bibliographic relationships and collocating the holdings information upon the general public. Furthermore, many of the perceived burdens for data input, such as the linking of record identification numbers, can be alleviated either through automatic supplying of the data or through automatic record validation.

The complexity of the record structure also should not be exaggerated. For the vast majority of the actual holdings records, including serials, the records will be straightforward, and many of the optional fields and subfields will not need to be applied.

- Separate fields for each level and type of piece enumeration were created in an effort to solve the problems of the single holdings field with subfields. In the latter approach, bibliographic notes that are item-specific could not be adequately tagged, indicated, or subfield coded.

In developing the capabilities of the TRLN online catalog, the planners needed to identify accurately the library functions to be supported, the data elements to support those functions, the basic organization of those elements, and the point at which that support needed to be built into the system design. Because the handling of open entries is ultimately an archival shelflist function, the TRLN holdings record incorporates the data now in the MARC bibliographic record, as well as the piece-specific holdings data, necessary to accommodate these functions. However, only the data elements now in the bibliographic record and piece enumeration were included; when the full check-in or circulation system is developed, it will be necessary to determine what additional nonbibliographic and nonholdings data elements will be needed in the record.

In an integrated automated system, the separability of records present in the manual environment will cease. When a fully integrated library information system is operational, it should not matter whether the functional design of the shelflist preceded the check-in system, or vice-versa. As long as there is correct identification from the outset of the functions and data elements that need to be supported in the system, that information may be integrated into the system design at the earliest pos-

sible moment. Thus planning for the future of library record maintenance is made more comprehensive, predictable, flexible, and accurate.

REFERENCES

1. American National Standards Institute, *American National Standard for Serial Holdings Statements at the Summary Level*. Approved Nov. 15, 1979 (New York: American National Standards Institute, 1980). Work has been completed by the American National Standards Committee Z39 SC E to combine the summary standard with the detailed holdings standard and to issue both in a single standard. In addition, a separate Z39 Subcommittee SC W is developing a holdings standard for monographs.
2. "Use of OCLC Field 949," *RTSD Newsletter* 7:30 (May/June 1982); "More on OCLC 949 Field," *RTSD Newsletter* 7:66 (Sept./Oct. and Nov./Dec. 1982).
3. Research Libraries Group, [*RLIN*] *Holdings Field Guide* (Stanford, Calif.: Research Libraries Group, 1981).
4. Tamer Uluakar, "Needed: A National Standard for Machine-Interpretable Representation of Serial Holdings—A Commentary," *RTSD Newsletter* 6:34-35 (May/June 1981).
5. Ruth Carter, "Standards: One That's Missing," *LITA Newsletter* 8:8 (Spring 1982).
6. *Proposed MARC Format for Holdings and Locations: Working Draft* (Gainesville, Fla.: Southeastern ARL Libraries; Washington, D.C.: Library of Congress, 1982).
7. Arnold Hirshon, "MARC Format for Holdings and Locations: An Overview," *RTSD Newsletter* 8:25-27 (Mar./Apr. 1983).
8. All TRLN documents, including the complete "General Structure for Holdings Records," are available at cost from Publications, Triangle Research Libraries Network, Davis Library, University of North Carolina at Chapel Hill, Chapel Hill, NC 27514. A list of other TRLN publications is also available from this address.

APPENDIX A
SHORT EXPLANATION OF THE TRLN
TECHNICAL HOLDINGS RECORD STRUCTURE

HEADER

- RID: Bib 1v1: Format: Entrd: Used: Rec stat:
 Name: [generally main entry, if present]
 Title: [as much of title proper or uniform title that will fit on one line]
 09X [call number, with appropriate tag, placed here if the call number is the same for all locations]
 DEF: [definition of caption data]

BLOCK

Line Tag Ind. Text
no.

- COP— Copy number. Also included in subfields: date of status transaction; nonretention status; record identification number between bibliographic and holdings records, etc.
- LOC— Location code. Also included in subfields: format of material; free-text location information; statistical data; physical size of volume.
- VOL— Volume numbers. Also included in subfields: statistical data; date of status transaction; retention status; acquisition status; coordinate numbering systems.
- PRT— Part numbers. Also included in subfields: same as in VOL field.
- SP#— Subpart numbers. Last character of tag is replaced by a specific subpart level number, e.g., SP1, SP2. Also included in subfields; same as in VOL field.

- EVL— Equivalence field. Includes in subfields the series numbering, the set numbering, and the record identification number of the set analytic.
- ACP— Accompanying material field. May have multiple levels, e.g., ACP = copy, AVL = volume. Also included in subfields; same as in VOL field.
- 5XX— Bibliographic notes (piece-specific or local only). Use tags: 500 (general note); 501 (bound with); 504 (bibliography/discography); 506 (limited use); 510 (citation); 525 (supplement); 533 (photoreproduction); 541 (provenance); 543 (solicitation information).
- 09X— Call number, if different call number used in different locations. Use correct 05X-09X tag.

Indicators for the alphabetically tagged fields: Positions 1 and 2 are for the physical format of the material; position 3 is for the archival status, e.g., lost, missing, withdrawn. The first two indicators for the note and call number fields are the same as defined in MARC bibliographic formats. The note third indicator shows whether the note should be included in public displays. The call number third indicator shows whether the call number may be duplicated across library locations.

Electronic Publishing and Its Impact on Libraries: A Literature Review

Meredith Butler

Electronic publishing is a topic of vital interest to the future of libraries. In this review of recent literature on electronic publishing, key researchers, issues, and trends are identified. Predictions about the rate of technological change and the likely impact on libraries are explored. Related concerns about technological change and copyright, newspaper production, and the publishing industry are discussed briefly.

INVESTIGATING THE CURRENT literature on electronic publishing is like opening a Pandora's box. What seems like a straightforward topic on first glance is, in fact, endlessly complex. The topic of electronic publishing covers a wide spectrum of activities in a variety of industries and professions. Most obviously related are the publishing industry, particularly newspaper and journal publishers, the telecommunications and broadcasting industries, libraries and other information providers, and vendors and suppliers of computer hardware and software.

The literature on electronic publishing is still manageable, but daily growing rapidly in quantity and complexity. This literature review is a bibliographic essay, a summary of recent articles and research reports of interest primarily to librarians. Concluding the essay are brief synopses of articles of peripheral interest focused more closely on the publishing industry and professions concerned with legal and copyright issues raised by computer technologies. Although this author has been thorough and judicious in selection, there is no doubt that many additional informational resources could be added to this bibliography. This work should be viewed as a catalytic resource to generate interest in further reading and discussion on a topic that should be foremost in our thinking and planning for our libraries' future.

This literature review by Meredith Butler, Assistant Director for Planning, State University of New York at Albany, had its origins in a project the author undertook for the RTSD Reproduction of Library Materials Section Committee on Technology. The editor wishes to express her appreciation to the author for her cooperation in bringing her review of this burgeoning literature up to date, as of the latest possible moment in October 1983.

Broadly speaking, electronic publishing is the substitution of electronically generated material, usually displayed on a cathode ray tube, for material published as print on paper. This definition may be expanded to include the dissemination of text and graphics over electronic channels (television, radio, cable TV, and telephone wires).

Many people in the publishing, computer, and telecommunications industries are writing about electronic publishing, videotex, information delivery systems, and machine-readable storage devices. But when the focus is narrowed to the implications of these new technologies on libraries and the role of the electronic library in the electronic society, the field narrows to a few key researchers and futuristic thinkers. Certainly F. W. Lancaster has been an eloquent spokesman on the paperless society and the future of libraries for many years. Donald King is another leader in this field, as are J. C. R. Lickliger, James Thompson, and a few others.

It is likely that the impact of technological change on libraries will be revolutionary and far-reaching. Are we preparing ourselves to understand and adapt to these technological changes? Are we making decisions today that will encourage the smooth transition to the electronic library?

OVERVIEWS

Frederick W. Lancaster in his recent book, *Libraries and Librarians in an Age of Electronics*, attempts to pull together his extensive writings on evolving technology, the paperless society, and the implications of this evolution for libraries.¹ Through his writing, Lancaster hopes to stimulate librarians to reassess the role of the library as an institution and the role of the librarian as an information specialist.

Lancaster reviews the technological trends of the last twenty years in telecommunications and computer technology for applications such as information storage and retrieval, electronic mail, teleconference, interactive television, and publishing and forecasts the likely impact of future technological developments for libraries and what the future of libraries might be.

Librarians looking for a short cut through "future" literature of the past two decades will find in this book an excellent overview of contributions by Toffler, A. C. Clarke, Peter Drucker, and E. C. Joseph. The extensive bibliography can be mined for further reading on most aspects of technology discussed in the body of the text.

Lancaster's several scenarios of the likely future of the library as institution are provocative and challenging but more than a little naively simplistic in their assumptions about technological change and human adaptation to and acceptance of it.

This book, however, provides an excellent foundation and starting point from which to explore electronic publishing, telecommunications, computer technology, and other developments of the age of information.

Donald King's paper, *Electronic Publishing and Its Implications for Libraries*, provides a good overview of the future effects of information technology on libraries and library services.² King emphasizes the roles of

online retrieval systems and electronic processes involving published literature. The following aspects are examined: line charges and terminal costs, a comprehensive electronic journal system, interlibrary loans, electronic publishing via a text editing system, economic constraints, and technological constraints. His focus throughout the report is on scientific and technical literature.

King cites Lancaster's delphi survey of experts in the field on future developments in electronic publishing and their projected timetables for change.³ King thinks that changes won't come as rapidly as many experts predict because of economic rather than technological reasons. Large fixed costs of abstracting and indexing publications will have to be recouped by publishers. Currently costs are recouped by selling a large number of printed copies, thus lowering the cost per copy. There will have to be a balance maintained between the price of an online search and the published bibliographic products for publishers to have the economic incentive to go electronic.

Improved telecommunications technologies such as optic fiber and satellites will provide a broader range of materials through telecommunications media at much lower cost. Use of intelligent terminals or microcomputers that can receive, store, and print out messages quickly will also help to reduce costs.

There presently exist all the components of a comprehensive electronic journal system that could provide the full text in addition to a bibliographic citation of a research article. Electronic processing on demand is the most economic form of journal distribution. The question is not can we do it, but when are we going to do it.

King does not believe that a completely electronic and paperless society is going to happen, largely because of economic and political considerations and the lack of incentive to change on the part of communication participants. He sees the need for electronic alternatives to present information systems and discusses in some detail the likely future for scientific and technical information and the effects change will have on libraries.

James Thompson in his recent addition to the literature, *The End of Libraries*,⁴ states in no uncertain terms that the unusability of present day libraries, a result of sheer size of collections, the inadequacies and vagaries of classification systems, the nature of the book itself, and library professionals' attitudes, may lead to the extinction of libraries. Libraries are failing to respond fast enough to "pre-emptive technology," that is, technology that eliminates all former options. Continued inertia will result in libraries' losing their basic connection with information access, with their recreational, cultural, educational role. They will become archives of increasingly irrelevant collections of printed materials. Thompson believes, "libraries must change because they—or, at least, what they represent—are too important to society. They are mankind's memory."⁵ Librarians must reject collection building and focus on building linkages for information users. Libraries have a vital role to play in the electronic age. Their mission of selection, storage, organization, and dissemination of information will remain crucial. The way li-

braries carry out this mission will have to change dramatically if libraries are to survive. Thompson distills the ideas of some of the leading thinkers on the electronic age and presents a coherent and challenging message.

Mary Wolfe, in her paper, *The Future of the Library in an Electronic Society: The State of the Art*,⁶ describes how applications of technology to library functions generally follow the three-phase pattern set by business. In phase one, technology is applied to the automation of manual procedures in order to save time and/or money. Phase two involves the use of technology for nontraditional, innovative approaches to traditional functions, while phase three represents the use of computers to provide nontraditional services or processes. Libraries are seen to be moving to phase two and three applications, and Wolfe postulates that developments in teleconferencing, electronic mail, and electronic publishing will have an important impact on the functions of the library in the future.

Frederick W. Lancaster may be considered a pioneer in the field of electronic publishing. His several articles and books on the future of libraries and paperless information systems have given many other researchers much food for thought. In 1979, Lancaster edited the *Proceedings of the 16th Annual Clinic on Library Applications of Data Processing* in which the role of the library of the future was the focus of the presented papers.⁷ Many of the papers were given by experts outside the library field. Topics covered included electronic publishing of both newspapers and journals, computer conferencing, electronic mail, and forecasts about computer technology.

In addition to Lancaster's own paper,⁸ there are many papers in the proceedings that express provocative ideas. Yale Professor Derek de Solla Price proposes that secondary literature will be eliminated by primary literature in machine-readable form and that librarians will develop new skills to mediate between computers and people.⁹ Gerald Salton presented his views about users creating a do-it-yourself classification system that eliminates the need for authority control.¹⁰ Taken as a whole, these papers present a combination of solid information and interesting predictions and are required reading for all librarians interested in the electronic future of libraries.

F. W. Lancaster, in his "Mission Possible—A Future Information System,"¹¹ creates a scenario for potential future publication of journals in electronic form, from report writing and text editing at individual terminals to acceptance via electronic mail by publishers, to receipt of journal information at subscribers' terminals. Lancaster asserts that the scientist will receive much, if not all, professional mail in electronic form, will communicate with professional colleagues through personal terminals (electronic mail and teleconferencing), and will publish through electronic databases. Electronic journals will be issued by professional societies and commercial publishers, will have editors and editorial boards, policies and standards for acceptance of contributions, and some form of refereeing. The pattern of distribution and use of electronic journals may be similar to the present pattern of distribution and use of on-

line databases, i.e., payment of royalty fee for access to information.

Bibliographic control of literature could be handled through online cooperative networks of information centers. The "libraries" of the future? The librarian of the future could become an indispensable guide to a rapidly expanding universe of information resources in electronic form.

A. E. Cawkell in his 1980 article in the *Journal of Information Science* states that the rate of introduction of electronic publishing will depend on the convergence of telephone, data transmission, and computer technologies.¹² This convergence will in turn depend upon political, social, technological, and commercial factors. The first two will retard the rate of change while the latter two will accelerate the rate.

Communication monopolies are eroding and total communications costs will be reduced as more satellite, fiber-optic, and improved coaxial cables are introduced.

Copyright will continue to present problems, but organizations may push for litigation to clarify complex issues.

Consumer acceptance of computers remains an unknown, but the likelihood is that computers will gain wide acceptance, despite fears associated with unemployment, invasion of privacy, etc. The author asks a critical question not addressed by many writers on this topic: What will the increase in real information be? His prediction is that it will take ten to fifteen years for all-digital communications systems to become widely available.

The most likely system to become available in the near future in businesses and homes is a videotex system. If it becomes widely distributed, is cheap and easy to use, embodies a printer, and meets the needs of consumers, it will set the stage for electronic publishing. A sufficiently large customer base will have been established. Cawkell does not expect to see this development until the latter half of the decade.

Present-day information retrieval services will increase charges to users as demand for their printed services drops. New databases that can't recover costs for a printed product will be more expensive. However, these costs will be offset by reductions in communications costs. "During the next five years (1981-86) it is hard to visualize any major shift from print-on-paper to all-electronic systems on a global scale. The most likely opportunities will occur in the business and office areas."¹³

Turoff and Hiltz in a recent article in the *Journal of the American Society for Information Science* state that computer-based alternatives to the traditional print-based journal may soon make our concept of a professional or scientific journal outmoded.¹⁴ The authors believe we are at least a decade away from substantially supplementing print-based journals with electronic ones. They also point out that any replacement for present-day journals will have to take into account the dual roles of information dissemination tools as well as the provision of social control for scientific fields, i.e., serving as a vehicle for the recognition and reward of successful researchers.

The authors reexamine the concept of the journal in the light of current computer-communications technology and discuss four forms of

electronic journals that have emerged on the Electronic Information Exchange System (EIES). The four forms are: (1) an informal newsletter, (2) an unrefereed "paper fair," (3) a journal that replicates the traditional print-based system, and (4) a highly structural inquiry-response system. The economic imperatives that will force the replacement of current print-based journals are reviewed. It is predicted that the next few decades will witness the emergence of networks of small computer systems dedicated to dispersed journal functions and under the control of the primary communities responsible for the creation of the information.¹⁵

Jeanne Guillaume offers readers a rare and exciting opportunity to find out how an electronic journal and computer conferencing really work.¹⁶ The author reports the evaluation results of an experimental computer conferencing system, Electronic Information Exchange System (EIES), developed by Murray Turoff at the New Jersey Institute of Technology. The evaluation looked at the functioning of the interactive group of academics involved in the experiment as well as the quality of the research and the information exchange carried out. "Users had mixed feelings about the viability of computer conferencing as an effective medium of exchange and decidedly negative feelings regarding the system's usefulness for producing and/or storing personal files or documents."¹⁷ What was missing in the electronic conferencing was a lack of process/observational skills among the participants. Skills that may be present in a group that interacts in person, may be stifled by electronic communication. The author concludes, "It is not sufficient for participants, system designers, and computer specialists to assume that the interactive and information exchange patterns which are appropriate in a print medium will be equally appropriate in an electronic medium."¹⁸

The Fall 1981 issue of the *Drexel Library Quarterly* focuses on many different aspects of the electronic library.¹⁹ Joseph Matthews offers a primer on the computer and what it can do; Richard Sweeney discusses remote document delivery through videotex and the role of public library services in the electronic telecommunications systems that are currently being developed; Brigitte Kenney reviews the past, present, and likely future of library information delivery systems; Neal Kaske and Nancy Saunders present their thoughts on networking and the electronic library. Additional topics covered include C. Edwin Dowlin's article on the education necessary to prepare professionals for the electronic library; Barbara Conroy's views on training and development of staff who work in the electronic library; and Richard Walter and V. F. Kralisz' article on financing the electronic library.

Although, as is so often the case with collections like this one, quality differs from article to article and some of the material presented is basic textbook material, this collection contains a number of thought-provoking ideas and packages a lot of interesting perspectives on the topic in a readily accessible format.

Kenneth Dowlin proposes an expanded role for the electronic library and stresses that the future is here and that libraries should be adventurous and welcome the ability to provide an enormous increase in the

amount of information for the public.²⁰ He stresses that rather than technology, access and the use of technology to expand access should be the focus of librarians' thinking about the future.

In contrast, S. D. Neill²¹ believes that the role of the library of the future is unclear and that libraries are in a difficult position to initiate change because they are "impartial providers of information on demand."²² The author's view of librarians of the future is that they will be self-employed information brokers. Public libraries will be unwilling to compete with private information companies and will "divert their energies to the information-poor segments of society."²³ Neill's predictions about the impact of change on university libraries are surprisingly conservative, e.g., they will change their operations but not their purposes. By the year 2010, the author believes, all university libraries and large public libraries will provide free access to online bibliographical services, but these services will be peripheral to the high priority of the book collection. Conservation and storage of materials will become primary professional goals. The author believes change over the next thirty years will happen very gradually and libraries in 2010 will not look so very different from libraries in 1984.

Seiler and Raben believe the modern library will be replaced by the electronic library and that academic administrators may not be as resistant to the idea of electronic dissemination of research findings as many think.²⁴ In a benchmark survey of academic administrators of 226 U.S. universities on the issue of electronic publishing and the academic evaluation system, the authors found a surprisingly widespread attitudinal acceptance of electronic publication as an acceptable alternative to traditional print publishing. They identify cost rather than user acceptance as the primary factor with which librarians and information personnel will have to cope in planning for change.

Although not specifically addressed to the effects of computer technology on libraries, Susan Artandi's thought-provoking essay identifies some of the social changes that computerization brings about.²⁵ Artandi believes that social awareness concerning the impact of technology has not been given serious thought. Librarians will be directly affected by the issues of system complexity, accountability, privacy, data security, and job displacement that accompany technological change and need to give these issues serious thought now.

And what of the future of the book? Elie Shneour, in a recent essay in *Publishers Weekly*, diagnoses the problems of print publishing.²⁶ "Paper and labor costs have been rising so steeply as to jeopardize the long-term survival of the book as a major element of modern civilization."²⁷ But, he goes on to say, "the book has attributes of such convenience over every other existing form of information storage and retrieval that it is not likely to be easily superseded."²⁸ Can we retain the real advantages of the book and avoid the rising costs of traditional publishing? Shneour thinks it is possible, but cautions that the specifics of how are yet to be developed and refined. The scenario he presents would eliminate libraries and the publication of books as we know them today.

Edward Walters, a professional historian and director of libraries, of-

fers a counterview in his article, "The Future of the Book: A Historian's Perspective."²⁹ He believes that technology will lead to a more complex and more diversified information environment, rather than change services in any radical way. His view is based on his analysis of the differing research requirements of academic disciplines and the likely economic pressures on researchers.

Peter Curwen's comprehensive study of the state of the art of British publishing devotes a few pages to the future of the printed word and electronic publishing.³⁰ The author takes exception to the prediction that the printed book will be replaced by the electronic book. Although Curwen agrees that the electronic book is a practical proposition from a technological point of view and that the economics of electronic publishing will make the electronic book attractive in the marketplace, he questions whether the reading public will purchase electronic books on a scale necessary to make them an attractive buy. He feels that it is too soon to tell what will happen, but cautions about predicting a premature death for the printed book.

As is evident from the above summaries, many authors are examining electronic technology and discussing its various applications to libraries. Baumol and Blackman are two of the very few authors writing about the cost of computerized operation of libraries relative to costs of more conventional operations.³¹ The authors dissect the "technocratic view" of the future expressed by Lancaster, Thompson, and others and test the hypothesis that traditional labor-intensive methods of library operation will give way to the computer because of economic incentives. Using cost data from the past three decades, Baumol and Blackman illustrate the cost disease of library operations, discuss trends in computer costs, and show how the rising costs of computer software are outpacing the decline in computer hardware costs. The probability that the rate of technological progress in electronics and communication will continue is almost a foregone conclusion. The authors predict that the labor component of electronic technology will be subject to the cost disease found in traditional operations and computer costs will actually begin to rise. In short, the electronic library will retain a large labor-intensive component and will continue to need substantial financial support to carry out its mission. Baumol and Blackman present a very thought-provoking and well-documented economic analysis of the prospects of the electronic library.

In addition to these articles just discussed in which the primary focus is electronic publishing and implications for libraries and library collections, there are numerous articles in which the impact on newspaper publishing, on the printing industry, and on the communications industry is discussed. The following is a brief synopsis of some of the more interesting material that discusses electronic publishing in this wider context.

PUBLISHING ASPECTS

Borrell, in his article, "Developments in Electronic Publishing," looks at the application of new technologies in the printing industry and sees that this industry is trying hard to integrate the technologies of word

processing, photocomposition and phototypesetting, computer graphics, laser scanning, communications, and information retrieval.³² Economic limitations are forcing publishers to introduce techniques of electronic publishing, incrementally for the moment, but ultimately the total capture, dissemination, and display of information will be through digital techniques. The common factor for this transitional period is the introduction of electronics into the mechanical processes of printing. Borrell believes that "the crucial factor hindering a fast transition to electronic media is the inability of digital technologies to produce images that can match the quality or cost of mechanical printing."³³ He thinks that real solutions may not be forthcoming for another two decades. Electronic publishing will slowly evolve in that time frame. Borrell also believes that as long as print and video media have different psychophysiological effects there will be a demand for familiar print products. Perhaps more conservative and pragmatic than some, Borrell's point of view should not be dismissed lightly.

Jonathan Newcomb, vice-president of Standard & Poor's, relates the effect of changes in the printing industry to libraries and the relationship between publishers and librarians in his article, "Electronic Information Distribution: The Role of the Traditional Publisher and the Librarian."³⁴ The author sees the end use of the information and the inclination or ability of the end user to deal with electronic services as the deciding factors in the decision to embrace electronic publishing technology. I would add a third: the end user's willingness and ability to pay for needed information. Newcomb believes that "the arena for publishing and electronic distribution is becoming increasingly more complex and difficult, not only for the publisher but for the end user."³⁵ He thinks that librarians are likely to benefit from this complex environment as they "orchestrate the inflows of information available from multiple sources and in multiple media to insure the most cost-effective use of outside information resource budgets."³⁶ Librarians and publishers are facing the same types of problems and opportunities. Changes will be evolutionary and slower than many experts predict, but the future belongs to the risk-takers.

Singleton provides excellent coverage of the advantages and disadvantages of the electronic journal and points out problems of cost of production and transmission.³⁷

Robert Campbell, director of Blackwell Scientific Publications, in an article in *The Bookseller*, forecasts some of the far-reaching effects that computer storage and transmission are likely to have on people's use of published material.³⁸ Campbell believes that the conventional research journal and its current mode of publication will become obsolete in the next decade. Authors will input their articles on a computer terminal where the material will be stored in machine-readable form. The articles could then be transmitted digitally to the editor. All reviewing, rewrite, etc., will be done via the computer terminal, and the final product can be stored in a data bank for on-demand access. Fees would be charged for each use of the electronically stored information and, if desired, copies could be printed by a computerized typesetter for conventional distribu-

tion. Pros and cons of this scenario are discussed as well as the application of similar publishing methods to textbooks and leisure reading materials. Implications for booksellers and libraries are addressed. In a more recent article for *Chemistry and Industry*, Campbell expands on this theme. He sees the electronic journal and document delivery systems as answers to current copyright/photocopying problems. "With an electronic journal it is possible to log every use made of the database, so publishers could be in the happy position of being able to collect a fee for every time an article is printed out at a terminal (the equivalent of a photocopy). This is a fairer system, but the charges will have to be higher than expected as there will no longer be 'cash up front' subscriptions."³⁹

In two issues of *The Bookseller*, Bruce Coward discusses opportunities that electronic publishing presents to the book trade—the information publisher of reference books, dictionaries, publishers of children's books, technical information publishers.⁴⁰ Effects of view data systems on publishers of Open University and similar academic materials are covered. Copyright issues and economic considerations are mentioned briefly.

Seldon Terrant of the American Chemical Society prepared a state-of-the-art report on electronic publishing of scientific journals for a recent issue of *Chemical and Engineering News*.⁴¹ Written in clear, lucid prose, this report covers some of the same ground as other articles reviewed previously, but provides a great deal of information in a well-organized and succinct summary and provides current information on technological changes in scientific publishing. Terrant does a nice job of discussing both the benefits and the problems of technological change for publishers, libraries, and users.

In part one of *The Print Publisher in an Electronic World*, speakers address new information technologies such as videodisc, videotex, satellite distribution, and developments in the home video market.⁴² Speakers in the second part of the conference discuss how major publishers are preparing for electronic publishing. Examples for newspaper, periodical, book, and diversified publishers are given. Public policy issues are discussed. Part three of the conference covered emerging education markets for information technology, including the education publishers and electronic distribution, video programming, and microcomputers in the school. Part four addressed the role of new information technologies in consumer markets. Topics range from electronic twenty-four-hour news services to video distribution for the print publisher, the videodisc, and the impact of video distribution on programming.

Alber proclaims that videotex promises the biggest opportunity for changes in the publishing industry and thinks it will have a major impact on newspaper and journal publishers.⁴³ Economic and market forces have already changed the way the printed word is prepared, edited, and put together. Costs of traditional distribution systems will undergo big price increases forcing publishers to adopt electronic distribution systems to augment rather than totally replace present printed products. The author defines the need for a delivery or videotex system and the role videotex will play in the future of publishing.

PROBLEMS

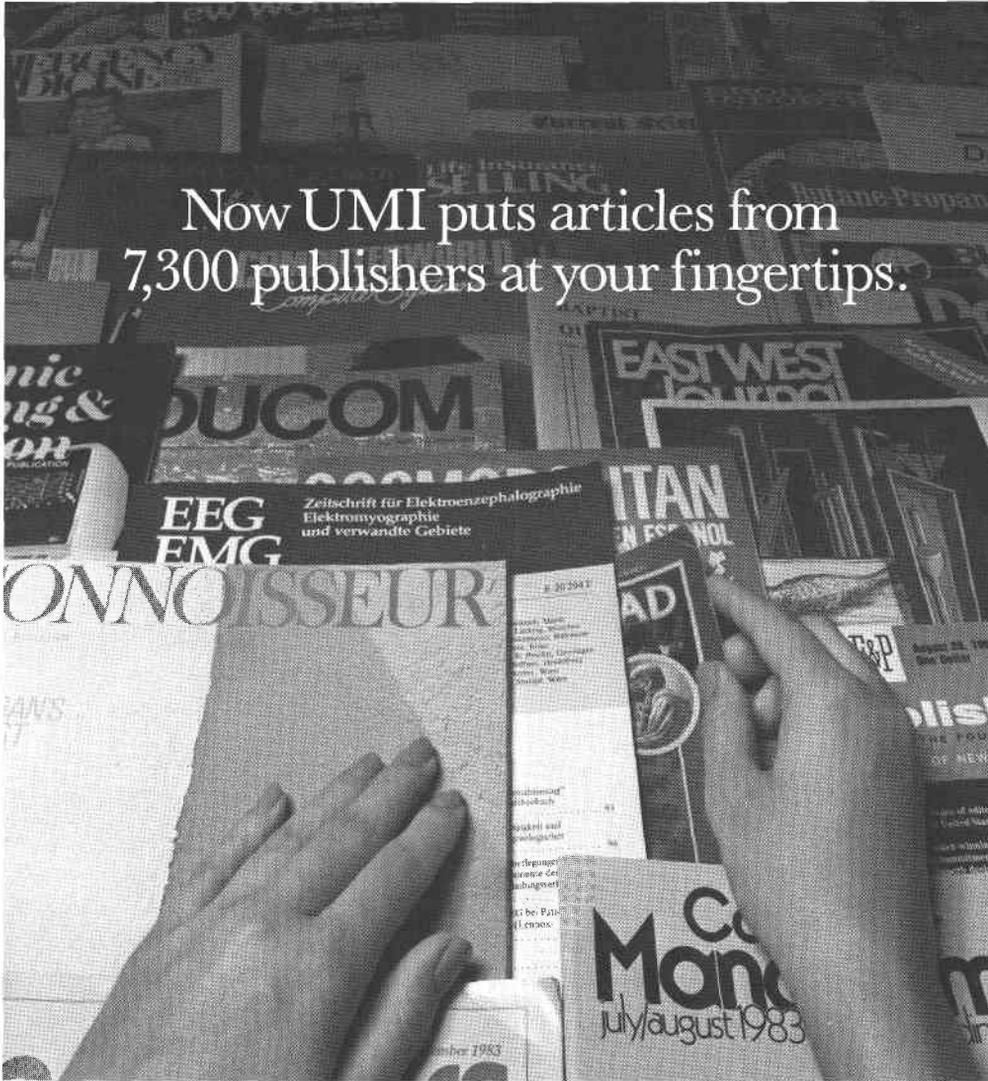
A number of authors mentioned problems that can be anticipated with the developing electronic technology. Two articles discuss these problems in more detail. Howard Fields, in an article in *Publishers Weekly*, discusses needs for standards in telecommunications and briefly mentions some problems associated with change from print to video or electronic publishing.⁴⁴

Appearing in a later issue of the same journal is Robert Dahlin's⁴⁵ update on his earlier two-part exploration of present and future means of disseminating information electronically, which describes developments in database services and the early signs of problems in the transition from print publishing to electronic publishing.^{46,47} A number of reference databases and indexes are discussed, including Superindex, Harper & Row's HARFAX, Time Share Corporation's Guidance Information System, and the American Heritage Dictionary, as are developments in teletext, videotex, and microcomputer courseware from the point of view of publisher interest. Videodisc developments are contrasted to videocassettes and videocassette recorders.

COPYRIGHT AND OTHER PUBLIC POLICY ISSUES

There is one exceedingly problematic area that most authors mention but few are willing to delve into—copyright and electronic technology. The American Library Association has stressed the need to focus energies on this issue rather than on the single question of photocopying. The *ALA Washington Newsletter* announces news from a series of hearings begun in July 1983 to address issues of copyright and technological change. Chaired by the Honorable Robert W. Kastenmeier, these hearings will, no doubt, generate a new body of literature on the topic. One of the few good summaries from an earlier Kastenmeier effort was published in the *Congressional Record*, the proceedings of the symposium held at American University in April 1967. Entitled *Automated Information Systems and Copyright Law*, the proceedings include the following papers:⁴⁸

- "Copyright Law Revision: History and Prospects," by Barbara A. Ringer
- "Post-Gutenberg Copyright Concepts," by Paul G. Zurkowski
- "Copyright and the Computer: Why the Unauthorized Duplication of Copyrighted Materials for Use as Computer Input Should Constitute Infringement," by Arthur J. Greenbaum
- "Economics, Automation and Copyright," by Charles H. Lieb
- "Electronic Computers: Storage and Retrieval," by Mervin E. Muller
- "Technology and the Copyright Law: The Systems Approach," by George V. Eltgroth
- "Authors' Rights," by Irwin Karp
- "Permissions and Payments in Automated Systems," by Harold E. Wigren
- "A Code for the Unique Identification of Recorded Knowledge and Information," by Howard J. Hilton



Now UMI puts articles from
7,300 publishers at your fingertips.

Here we are, in the midst of the Age of Information, and everybody wants some. Economically. Quickly. Without a hassle.

And here *we* are, at University Microfilms International, introducing an answer that makes sense for you.

We call it UMI Article Clearinghouse.

You'll be able to access our

catalog of over 7,300 periodical titles and order copies of articles electronically. Via the OCLC ILL Subsystem and ITT Dialcom and others to come. You can order electronically through CLASS OnTyme and over ALANET as well.

You'll also have the assurance that we hold the listed titles and that you're getting articles

Introducing the UMI Article Clearinghouse



from a licensed agent. They'll be shipped to you within 48 hours. And it won't cost you an arm and a leg. (\$4-\$6 per article for deposit accounts; \$8 for credit card accounts.)

Our January 1984 Catalog is available now. Call 1-800-732-0616 (in Michigan, Alaska and Hawaii, call collect 313/761-4700) for your free copy.

UMI Article
Clearinghouse

University Microfilms International
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

"The Publishers' Rumpelstiltskin: Copyright Revision," by Kirby B. Westheimer

"Summary and Analysis," by Lowell Hattery and George Bush

"Conclusions and Recommendations," by Lowell Hattery and George Bush.

Of special note is the paper by Zurkowski, who envisions an era when publishers will promote copying in a variety of formats because the economic incentive to receive numerous small royalties for use of parts of a work in addition to the sale of entire works will be attractive. Document centers would organize materials by using a unique document identification system and a time-sharing system. The computer would make it possible to handle copying accounts for on-demand reproduction in any format. "Libraries" would maintain user profiles and direct information to users who subscribe to information services. Copyright would not be a problem in this scenario because users would pay royalty and accounting costs. The benefit would be increased access to extensive stores of information.

Authors Lieb, Muller, and Eltgroth discuss the economic and technical issues of automated information retrieval. Karp argues eloquently for the author of fiction and considers the implications of automated information networks for the creators of literary and dramatic works.

The summary and conclusion are particularly informative and help interpret complex issues. Many issues raised in these papers have not been resolved by the subsequent passing of the new copyright law and are still relevant to the current continuing copyright/automation debate. They will, no doubt, furnish much of the agenda for the new series of hearings presently under way in the House.

In *The Birth of Electronic Publishing*, Neustadt points out that the legal status of electronic publishing is confused because the rules were written in a different era and urges that the new medium be freed from content and rate regulation, whatever the method of transmitting information to customers.⁴⁹ Such regulation is not needed, according to Neustadt, because there will be tremendous diversity. However, governmental action may be needed to ensure that there is diversity.

The author provides information about the history of the U.S. communications law and suggests ways that the courts, Congress, and the FCC will shape rules and regulations for videotex, teletext, and cable TV. He deals with such issues as the current debates about whether the FCC should set a technical standard for over-the-air services; what can be done to ensure personal privacy—threatened by the existence of computerized databases about people's behavior; the complex pattern of federal, state, and local regulation of cable; how current laws about defamation and obscenity will be applied; and the novel copyright problems posed by electronic publishing.

Neustadt also details the telephone industry's role in videotex. He recommends minimal government intervention in the control of electronic publishing and includes a nontechnical explanation of how electronic publishing works, its technology, hardware, costs, and market structure.

Useful reading for the legal, publishing, and broadcasting professions, the book covers the most pertinent economic and legal questions being asked today by companies and individuals involved in the communications industries who need to know what the regulatory climate for electronic publishing is.

RECENT DEVELOPMENTS

In a paper presented at the annual meeting of the Association for Education in Journalism, Garrison reports on a study of effects of video display terminal (VDT) use on the work and perceptions of copy editors.⁵⁰ Findings are: adaption and adjustment to VDT were not difficult, caused no change in the quality of work, and routine tasks were reduced. The bibliography cites a number of articles on electronic publishing and newspapers.

In their special report, *Guide to Electronic Publishing: Opportunities in Online and Videodata Services*, Spigai and Sommer⁵¹ provide concise and current information to publishers and investors on potential business opportunities and the new technology. Both online and viewdata services are addressed and quantities of data about suppliers and costs are provided. Much of the statistical and cost data was out of date at the time of publication. Print publishers who want to know more about the rapid changes brought about by electronic technology and the emerging new media will find answers to their questions in this report. Other information professionals will find a wealth of nontechnical business-oriented information to help them understand what is happening to print publishing today.

Knowledge Industry Publications recently announced a new publication called *Data Base/Electronic Publishing: Review and Forecast, 1983*.⁵² Marketed as an authoritative report on the size and growth of the electronic publishing industry, this industry report promises to offer subscribers forecasts on major developments in new databases, new distributors, telecommunications, personal computers, software publishing, teletext, and videotex. Its list price of \$225 for approximately seventy-five pages of information points up other aspects of the impact of technology on libraries and information users, issues of access, costs, copy-right, user's fees, etc.

Several new journals focusing on new electronic technology for publishers and libraries have surfaced recently. *The Electronic Library*, published by Learned Information, Oxford, England, began life in January 1983 as a quarterly scholarly journal devoted to library automation and networks, the applications of minis and micros in libraries and information centers, and the development of software for such applications.⁵³ The journal's scope is international with David Raitt of the Netherlands as editor and an editorial board of acknowledged experts in their field. Although the journal's scope is limited in its focus, its approach is diverse. In addition to news notes, which were timely and informative, and book reviews, which were sufficiently extensive and evaluative, research papers in the first two issues covered topics ranging from software for microcomputers, conversational cataloging, library automation in

Norway, and the role of the library in the information society. The research papers were interesting and current, most presumed a solid foundation in present technology and its application to library processes. If future issues maintain the quality of the first two issues, this new journal should make a real contribution to librarianship at a relatively modest subscription rate of \$49 per year.

EPB: Electronic Publishing and Bookselling is a newsletter published by Oryx Press (the first issue appeared in June 1983) designed to describe computer systems that have been working for publishers and booksellers and describe them in English rather than "computerese."⁵⁴ Judging by the first issue, this newsletter will be of peripheral interest to librarians, other than those who keep up with developments in the publishing industry.

Other new journal titles that have recently been announced include *Electronic Publishing Review*, a quarterly published by Learned Information, Oxford, England,⁵⁵ and *Monitor*, a monthly review of current events in the online and electronic publishing industries by the same publisher.⁵⁶

As is readily apparent, the literature on electronic publishing is increasing daily. Nearly every selection mentioned in this review lists other sources of information, and several offer extensive bibliographies. Literature on many topics such as videotex, digital and optical digital storage devices, teletext, etc. was not reviewed here for the obvious reasons of lack of space and time. Electronic technology is the future, if not the only future, for libraries. It will be imperative for knowledgeable, well-informed librarians to plan that future. Perhaps this literature review will help librarians in the process of embracing change.

REFERENCES

1. Frederick W. Lancaster, *Libraries and Librarians in an Age of Electronics* (Arlington, Va.: Information Resources Pr., 1982).
2. Donald W. King, *Electronic Publishing and Its Implications for Libraries* (Arlington, Va.: ERIC Document Reproduction Service, 1979) Microfiche ED 196 435.
3. Frederick W. Lancaster, *The Impact of the Paperless Society on the Research Library of the Future* (Urbana: Univ. of Illinois, Graduate School of Library Science, 1980). Final report submitted to the National Science Foundation.
4. James Thompson, *The End of Libraries* (London: Bingley, 1982).
5. *Ibid.*, p.15.
6. Mary G. Wolfe, *The Future of the Library in an Electronic Society: The State of the Art* (Arlington, Va.: ERIC Document Reproduction Service, 1980) Microfiche ED 203 883.
7. Frederick W. Lancaster, Laura S. Drasgow, and Ellen B. Marks, eds., *Proceedings of the 16th Annual Clinic on Library Applications of Data Processing* (Urbana: Univ. of Illinois, 1980).
8. Frederick W. Lancaster, "The Role of the Library in an Electronic World," in *Proceedings of the 16th* (see ref. 7), p.162-91.
9. Derek John de Solla Price, "Happiness Is a Warm Librarian," in *Proceedings of the 16th* (see ref.7), p.3-15.
10. Gerald Salton, "Toward a Dynamic Library," in *Proceedings of the 16th* (see ref.7), p.60-81.
11. Frederick W. Lancaster, "Mission Possible—A Future Information System," *Canadian Library Journal* 36:339-42 (Dec. 1979).
12. A. E. Cawkell, "Electronic Information Processing and Publishing—Problems and

- Opportunities," *Journal of Information Science* 2:189-92 (Oct. 1980).
13. *Ibid.*, p.192.
 14. Murray Turoff and Starr Roxanne Hiltz, "The Electronic Journal: A Progress Report," *Journal of the American Society for Information Science* 33:195-202 (July 1982).
 15. *Ibid.*, p.195.
 16. Jeanne Guillaume, "Computer Conferencing and the Development of an Electronic Journal," *Canadian Journal of Information Science* 5:21-29 (May 1980).
 17. *Ibid.*, p.24.
 18. *Ibid.*, p.28.
 19. *Drexel Library Quarterly* 17:1-120 (Fall 1981).
 20. Kenneth Dowlin, "The Electronic Eclectic Library," *Library Journal* 105:2265-70 (Nov. 1, 1980).
 21. S. D. Neill, "Libraries in the Year 2010," *The Futurist* 15:47-51 (Oct. 1981).
 22. *Ibid.*, p.47.
 23. *Ibid.*, p.48.
 24. Lauren H. Seiler and Joseph Raben, "The Electronic Journal," *Society* 18:76-83 (Sept./Oct. 1981).
 25. Susan Artandi, "Computers and the Postindustrial Society: Symbiosis or Information Tyranny?" *Journal of the American Society for Information Science* 33:302-7 (Sept. 1982).
 26. Elie Shneur, "A Look into the Book of the Future," *Publishers Weekly* 223:48 (Jan. 21, 1983).
 27. *Ibid.*, p.48.
 28. *Ibid.*
 29. Edward M. Walters, "The Future of the Book: A Historian's Perspective," *Information Technology and Libraries* 1:15-21 (Mar. 1982).
 30. Peter J. Curwen, *The UK Publishing Industry* (Oxford: Pergamon, 1981), p.55-59.
 31. William J. Baumol and Sue Blackman, "Electronics, the Cost Disease, and the Operation of Libraries," *Journal of the American Society for Information Science* 34:181-91 (May 1983).
 32. Jerry Borrell, "Developments in Electronic Publishing," *American Society for Information Science Bulletin* 8:11-15 (June 1982).
 33. *Ibid.*, p.12.
 34. Jonathan Newcomb, "Electronic Information Distribution: The Role of the Traditional Publisher and the Librarian," *Special Libraries* 74:150-55 (Apr. 1983).
 35. *Ibid.*, p.153.
 36. *Ibid.*, p.152.
 37. Alan Singleton, "The Electronic Journal and Its Relatives," *Scholarly Publishing* 13:3-18 (Oct. 1981).
 38. Robert Campbell, "Publishing in the Information Age," *The Bookseller* no. 3943:188-92 (July 1981).
 39. Robert Campbell, "Electronic Publishing in Information Technology Year," *Chemistry and Industry* no.7:233 (Apr. 1982).
 40. Bruce Coward, "Electronic Publishing I," *The Bookseller* no.3875:1430-32 (Mar. 1980); "Electronic Publishing II," *The Bookseller* no.3876:1557-59 (Apr. 1980).
 41. Seldon W. Terrant, "Publishing Scientific Information Today . . . and Tomorrow," *Chemical and Engineering News* 61:51-58 (Apr. 25, 1983).
 42. *The Print Publisher in an Electronic World. Proceedings of a Conference Sponsored by Knowledge Industry Publications, December 1980* (White Plains, N.Y.: Knowledge Industry Publications, 1981).
 43. Antone F. Alber, "Get Ready for Electronic Publishing," *Business Horizons* 26:51-55 (Jan./Feb. 1983).
 44. Howard Fields, "Getting into Electronic Publishing: A Multitude of Problems," *Publishers Weekly* 221:58, 60 (Apr. 2, 1982).
 45. Robert Dahlin, "Electronic Publishing: Steps Forward—and Back," *Publishers Weekly* 221:26-31 (June 4, 1982).
 46. Robert Dahlin, "Watch That Book," *Publishers Weekly* 219:24-28, 30 (Mar. 20, 1981).
 47. Robert Dahlin, "Consumer as Creator," *Publishers Weekly* 219:21-27 (Mar. 27, 1981).

48. Lowell H. Hattery and George P. Bush, eds., *Automated Information Systems and Copyright Law: A Symposium of the American University*. *Congressional Record* 114:1-34 (June 11-14, 1968) (Arlington, Va.: ERIC Document Reproduction Service, 1968) Microfiche ED 054 790.
49. Richard M. Neustadt, *The Birth of Electronic Publishing: Legal and Economic Issues in Telephone, Cable and Over-the-Air Teletext and Videotext* (White Plains, N.Y.: Knowledge Industry Publications, 1982).
50. Bruce Garrison, "A Case Study of Electronic Editing and News Decision Making," in a paper presented at the annual meeting of the Association for Education in Journalism. East Lansing, Mich. August 8-11, 1981. (Arlington, Va.: ERIC Document Reproduction Service, 1981) Microfiche ED 203 343.
51. Fran Spigai and Peter Sommer, *Guide to Electronic Publishing: Opportunities in Online and Viewdata Services* (White Plains, N.Y.: Knowledge Industry Publications, 1982).
52. *Data Base/Electronic Publishing: Review and Forecast, 1983* (White Plains, N.Y.: Knowledge Industry Publications, 1983).
53. *The Electronic Library*. V.1, no.1- (Jan. 1983-) David Raitt, ed. (Oxford, England: Learned Information).
54. *EPB: Electronic Publishing and Bookselling*. V.1, no.1- (June 1983-) Sandra K. Paul, ed. (Phoenix, Ariz.: Oryx Press).
55. *Electronic Publishing Review*. V.1, no.1- (Mar. 1981-) David Raitt, ed. (Oxford, England: Learned Information).
56. *Monitor*. V.1, no.1 (Jan. 1981-) Harry Collier, ed. (Oxford, England: Learned Information).

Technical Services in the Age of Electronic Publishing

Edwin Brownrigg, Clifford Lynch, and Mary Engle

This article examines the traditional technical services functions and how they may change with the advent of widespread computer-based electronic publishing. The emphasis is on how technical services will have to adapt in an electronic publishing environment rather than on the details of electronic publishing technology. The implications of electronic publishing for library management and budgeting are also explored.

WITH THE ADVENT OF widespread computer-based electronic publishing, changes in the traditional technical services functions are inevitable. The introduction of electronic publishing will, in our opinion, bring about a return to the basics in technical services. Many functions, such as circulation and acquisitions, which have become highly stylized and formalized over the last few decades, will have to be reassessed and their initial premises reevaluated in light of the inherently different nature of the new methods of delivery and dissemination. Thus, throughout this article, we will constantly ask not only what constitutes current practice in technical services and how electronic publishing will change this current practice, but also what the goals of the activity in question really are.

Much of the thinking and writing about electronic publishing up to now has been concerned with case studies—the questions involved in converting a given publication or group of publications to electronic forms—or with specific problems of the electronic form, such as copy-right. Our goal in this article is to take a much broader view and to try to examine the overall nature of operation in an electronic publishing environment. For example, we are not concerned so much with how electronic journals will differ from printed journals, but with the fact that the advent of electronic journals will plunge the user and the librarian into a new world full of strange and unexpected implications. The challenge of coping with these new questions will fall heavily upon the technical services librarian.

The editor invited three members of the staff of the Division of Library Automation, University of California Systemwide Administration, Berkeley, to prepare this article for *LRTS* readers: Edwin Brownrigg, Director, Clifford Lynch, Manager of the Computing Resources Group, and Mary Engle, ADP Systems Analyst. The authors wish to acknowledge with thanks the assistance of Rebecca Pepper and D. R. Haines in preparing this paper.

© Edwin Brownrigg, Clifford Lynch, and Mary Engle 1984.

Electronic publishing is not yet a reality. There is little agreement on what electronic publishing will really mean. Depending on whose vision of the ultimate reality one selects, very different implications for the future of library operations arise. Before discussing the impact of electronic publishing on technical services, we must survey some of the visions of this future.

THE SHAPE OF THINGS TO COME

Rather than presenting a unified current of thought about the nature and definition of electronic publishing, the recent literature reveals a broad conceptual spectrum. The field is apparently too new and its potential too little understood for a consensus to have arisen.

At one end of this conceptual spectrum are authors who speak of electronic publishing as merely the ongoing pursuit of classical paper publishing by new and more effective electronic means. Their primary concern is with updating the technology of printing.¹ There is, in fact, a major technological revolution taking place today in the production of printed texts; this area is most commonly referred to as computer-based document composition, or computer typesetting, and revolves around very sophisticated computer programs such as Donald Knuth's T_EX system² and increasingly inexpensive and versatile laser-based printers and typesetters.³ From our point of view, however, these developments are of secondary importance, since they do not really affect how publications will be cataloged and delivered so much as how they are prepared.

Somewhere in the center of the spectrum are those who see electronic publishing as videotex systems that link computers to home television sets and let viewers with a keyboard select the information desired or send information back to the computer interactively.^{4,5}

How important is videotex? From an economic point of view, potentially very important, as it represents a major new outlet for many sorts of ephemeral information. From the point of view of the library, however, we would argue that it is relatively unimportant. Current television screen-based technology does not present an attractive environment for reading more than a few paragraphs of information at a time. It is a wonderful way to get a weather report, one's bank balance, news headlines, or review classified advertisements (which are hard to read even in their traditional printed forms). It is not a satisfactory medium through which to read a magazine article or a book. Thus, the information best suited for videotex delivery has relatively little overlap with the information that libraries have historically housed.

A second area in the middle of the conceptual spectrum lies much closer to the concerns of the library as a storehouse and organizer of information that is of more than ephemeral interest. Those working in this area are concerned with methods of access to computer-handled information. A considerable amount of effort is being directed toward delivering not only abstracting and indexing services electronically, but the primary journal as well, often in both hard-copy and computer-readable versions. Here, economic issues center around balancing the pricing of the various media so as to preserve the revenue base of the system as a whole. The BLEND System, an experiment at the Universities of Bir-

mingham and Loughborough,⁶ and actual production systems like the American Chemical Society's Chemical Abstracts Service⁷ are examples.

Toward the other end of the spectrum are speculators who describe electronic publishing as neither a new tool nor a new way of doing the same thing in a different guise but rather as an opportunity to introduce new products that may improve performance and revenue but which may, in the longer term, even if we do not see the demise of the book, replace existing conventional means of publication.⁸ It is in this end of the spectrum that discussions about the economics of new publication media and the nightmares of copyright law occur.⁹ Others in this part of the spectrum talk about the emancipation of information from static print and of how indexing and abstracting may provide access to dynamic, multidimensional, and even interactive publications.¹⁰ Such considerations go far beyond the problem of accessing static word-processed text through controlled vocabulary versus free text.¹¹

We believe that the future lies in replacing the existing conventional means of publishing. It is here, also, that the librarian or the information scientist has the most to contribute.

THE SHOCK OF THE ELECTRONIC ARTIFACT

What you are about to read is not true—not yet. Certainly it will not happen overnight, nor all at once. But changes are inevitable. Widespread electronic publishing will split today's library users into a number of very different constituencies. Consider two such cases. For scholars, the world of electronic publishing will create new and bizarre problems. Ithiel de Sola Pool, in his seminal essay "The Culture of Electronic Print," paints the following provocative picture of the situation confronting tomorrow's scholar.

Canonical text, produced in thousands of uniform copies, may cease to exist. As de Sola Pool describes it, the end of canonical text

foreshadows a return in print to the style of the manuscript, or even to the ways of oral conversation. Since Gutenberg, books, articles, manuals, or laws have been available in hundreds or thousands of locations in absolutely identical form. From that followed referencing; if you name the work, edition, and page, anyone anywhere can locate the identical thing. From that also followed catalogues and bibliographies. . . . Contrast that to the world of manuscripts, where every copy was unique, with its own minor variations. . . . Electronic publishing returns to that tradition. A small subculture of computer scientists who write and edit on networks like the ARPANET illustrate what is coming. One person types some comments at his terminal and gives access to it to colleagues on the network. As each modifies, edits, and expands what is there, the text changes from day to day. With each change, the text may be stored somewhere in different versions. . . . The implications of all of this for scholarship are mind-boggling. "Blue-sky" writing on the wonders of the computer age often describe how a scholar at his terminal will instantly be able to call up any book or article from the world's literature. Wrong. . . . Proliferation of texts available in multiple forms, with no clear line between early drafts and final printed versions, will overwhelm any identification of "the world's literature."¹²

We might add that with the computer typesetting and composition ca-

pabilities becoming available today, the researcher can at any time in the cycle described above produce a printed copy equal in quality to today's best typeset books.

Yet scholars are only one constituency. Consider a second case. Many public libraries exist to provide their users with recreational reading and relatively simple reference information. The user of a public library generally is interested in getting access to facts or fiction. Today, however, much of the research in library automation has concentrated on serving the needs of the researcher and the research library. This is also reflected in today's cataloging practices, which describe nonfiction material in considerable depth but simply catalog novels as "fiction" in most cases. For the public library constituency, the printed book will remain in use indefinitely, and the electronic publishing apparatus will be used to help patrons find material of interest rather than to deliver it. We will return to this point later in our discussion of cataloging.

Here then is one of the two key issues that lurk behind not only all discussions of technical processing in this new era but also behind broader questions of indexing, citation, bibliography, and scholarship: What is the nature of a publication in the electronic environment, and how can the current tools of bibliographic scholarship cope with this new artifact?

ECONOMIC CONSIDERATIONS

The second backdrop to any discussion of electronic publishing and its impact is a potentially drastic rearrangement of the economics and mechanics of the publishing process. Today an author finds a publisher, who produces the author's work. The library acquires a copy of the work, which is then made available to the library's patrons. This work exists in a form that is both discrete (i.e., an issue or an edition) and indivisible (the library acquires the entire work). It is acquired once by the library before any patron gains access to it and is paid for only at that time. The cost to the library is not usage-sensitive. Reproduction of the work is restricted under rather byzantine laws that mandate royalties and define "fair use," but, typically, problems of obeying these laws and collecting royalties are passed through to the patron.¹³

It will perhaps be decades before similar standard practice becomes established with electronic publishing. In the interim, there will be much less uniformity of practice, and the library will be confronted with a spectrum of models rather than the single standard situation described above. Technology already exists to call into question virtually every assumption implicit in today's model: the need for a publisher, non-use-sensitive pricing, the separation of acquisition and use, and the entire legal structure currently in place to protect the investment of the author and the publisher.

THE TRANSITION

Classical acquisitions, circulation, deacquisitions, and interlibrary loan—all, except for some archival material, will dwindle as electronic movement of library materials increases. Today (1983) *archival* connotes manuscripts and transcripts, and *library* connotes books and journals. The amount of energy spent today on managing *library* materials as op-

posed to *archival* materials is proportionally very large. Studies have long since concluded that most library use is of recently acquired material. Put another way, *library* materials are used more than *archival* materials.¹⁴ But, with the advent of electronic publishing and electronic document delivery, what today is processed as *library* material in the future will be processed as *archival* material. Documents published or transcribed and disseminated in machine-readable form will become the current material, and access to newly archived material will slowly grow more difficult.

It will be a long twilight, however, particularly for circulation and interlibrary loan. Publication of physical printed books will not stop suddenly, if at all. Even with recent advances in optical scanning and character recognition, it seems unlikely that massive retrospective conversion efforts will produce machine-readable copies of even a major part of the existing inventory of material. Thus older systems will continue to exist side by side with new electronic distribution systems. This situation will present vexing operational and budgetary problems for library managers and automators in the coming years. Should priority be given to improving old systems or deploying new ones for electronic media? Should attempts be made to integrate technical processing systems for the existing physical inventory with those for the new electronic inventory, or must parallel and distinct systems be maintained indefinitely?

A REVIEW OF THE CLASSICAL TECHNICAL SERVICES FUNCTIONS

Historically, all of the technical services activities have had important purposes. In the future some may become unimportant; deacquisitions, for example, will matter little because electronic documents do not consume very much space, and optical disk storage will make space very cheap. The impetus for deacquisitions has always been economic, and these economics will change because it costs more to eliminate data from a "write-once" medium, such as optical disk, than the space would be worth once it is recovered.

Circulation is primarily an inventory control function. But when materials can be duplicated indefinitely, and the patron always gets a copy, inventory ceases to be a concern. Yet circulation, at least theoretically, has a secondary purpose. Today the number of books borrowed is a plausible measure of library use. Circulation, or more accurately, usage data may become the basis both for billing patrons (should this become a library's policy) and for compensating publishers. It is not clear that libraries will find it necessary or desirable to pass along costs for electronic services to the patron, but current attempts to automate circulation systems will put the apparatus in place to do so.

Serials check-in is another inventory function. Depending on the billing arrangements, it may become either an accounting function, keeping track of text shipped from the publisher's computer to the library's computer, or just an information collection activity as the publisher's computer informs the library's computer when material becomes available (with the assumption that charges will be generated only when the

library makes use of the material by obtaining it on behalf of its patrons). In the most extreme case, the library's computer might make an inquiry to the publisher's system as to the availability of material only when some patron asks for it, completely eliminating a check-in operation. In any event, the paper-handling activities currently associated with serials check-in will come to an end—no more Cardex or its computer-based successor.

Interlibrary loan today is a method of resource sharing; it allegedly reduces costs. Depending again on the way charging for electronic material is done, this function may totally cease or may continue as a computer-to-computer transaction. The key questions will be whether the library continues to acquire material prior to its use by a patron and whether it pays for material at the time of its initial acquisition. Again, however, it is clear that the manual paper-handling activities will cease for electronically published material, in contrast to the interchange of archival materials. For archival materials, new technologies such as digital facsimile, in conjunction with very wide-band satellite telecommunications, may eliminate much of the physical shipment of paper.

There will be a new area that will integrate the business aspects of all of the above activities—accounting, payments, royalty collections, and the like—based on ground rules that are not yet clear. Libraries will be confronted with a new and complex world of contract negotiation and administration in support of these activities. In the last decade contracting with database vendors has become complicated. This trend will continue, and libraries will need ever-increasing expertise in both the legal and business aspects of such contractual commitments. Imagine negotiating with hundreds of publishers.

In the areas of acquisitions, cataloging and online catalogs, matters become most interesting. In an earlier article we proposed the notion that publishers would undertake major parts of the cataloging burden as an advertising activity.¹⁵ Let us assume that we end up with a system of real-time acquisition each time someone wants a book or article (perhaps subject to a maximum number of uses or some sliding discount scale). Note that this represents a radical change from the current state of affairs, where periodicals in particular are acquired on a regular basis and then, in many cases, receive little or no use. Note also that the real-time acquisition of material may be a situation that some publishers may fight tooth and nail.

In this situation, the user will not ask the library to acquire a piece of text unless the user knows that it exists. Therefore, there is a great economic impetus for the publisher to create catalog records for the material and either distribute them or make them available to the library at little or no cost in much the same way they now distribute catalogs of their books. The distribution would be far more widespread, however, and would include analytic cataloging of journal articles.

As noted earlier, however, current cataloging practice is of little use in convincing people that they want to acquire fiction. D. R. Haines points out, for example, that people often evaluate fiction by looking at the text on the inside of the book jacket. The blurb could be included in the cataloging/advertising-in-publication record for fiction (or for all types of

books), possibly in a new bibliographic field called "publisher's advertisement," as distinct from "cataloger's notes." (Even in scientific works, cataloging may have to be extended to include tables of contents and the like—which are available at little or no cost since they can be captured from the source text.)

Such cataloging/advertising is not without its problems. We have all had the experience of ordering a book based on somewhat overstated or inaccurate advertising material and of being disappointed. Also, today's collection development specialists serve a sort of editorial function, in the sense that the books held by a library in an area supervised by a good collection development specialist tend to be the more important works in the area. There may still be a need for collection development groups to endorse books or articles and for these endorsements to be available to the patron as guidance in selecting material.

One positive aspect of this process may be a reduction, at long last, in the rate of growth of available information. Useless material may become easier to recognize since it will often languish unacquired in the publishers' computers or receive little use after the library acquires it. It will be possible to build feedback mechanisms that allow users to rate or review materials after they have used them. The occupation of book or article editor or reviewer may take on new prestige and importance, since a user confronted with fifty otherwise undistinguishable articles will need some criteria for making selections.

If users become able to initiate an acquisitions process and spend the library's money, other implications arise. Today libraries have acquisitions budgets that are typically sub-allocated into various subject areas. Mechanisms will have to be developed to permit the library to maintain control in this new environment. Imagine the patron's being told by the computer system that the library is unable to provide any more articles on biology this year because the acquisitions budget has been exhausted. Billing might also become a sore point, and one of the major new business functions of the library could become the maintenance of credit with various publishers. One can envision a user requesting material from a publisher's online system and getting a message from the publisher's computer saying, "Your library is 90 days in arrears and we are not letting it have any more text till it pays up." As the library stores less and less material in-house on a permanent basis, it will become more and more reliant on the smooth continuance of its relationships with external suppliers.

Thus it is in the areas of acquisitions and cataloging that the greatest change will occur. In the most extreme scenario one can envision a library's online catalog serving less as a catalog of the library's holdings than as an online shopping guide to documents offered by various authors, publishers, or learned societies. Cataloging in the classical sense would become the responsibility of the information provider rather than the library—the library would act more as a delivery channel than as a selective information acquirer and organizer.

THE LIBRARY IN AN ELECTRONIC PUBLISHING ENVIRONMENT

This leads to some very difficult questions about the future role of the

library and its viability in the electronic publishing environment. Why should the user bother to go through the library at all—why not connect directly to the publishers' online catalogs from a personal computer? One justification might be simple economics. If the library is somehow paying for or at least subsidizing the costs of obtaining information from the publishers on behalf of the patron, there is a good economic incentive to use the library rather than to go directly to the publisher, much the same as for borrowing a book from the library today instead of buying it. The key question here is whether the cost to libraries of obtaining information can be amortized over many users. Can the library transfer the text to its computer, paying for it once at the time of acquisition, and then redistribute it at will without incurring further charges? The growth of computer networks suggests that this is unrealistic; with a sufficiently widespread network, the library community as a whole could simply acquire the text once and ship it around indefinitely at no extra cost. Issues concerning the scope of a library or library consortium and what constitutes "legitimate" (i.e., inexpensive or free) redistribution will loom large in future library contract negotiations with electronic publishers.

A second justification for the continued use of libraries lies in a recognition of the evaluation aspect of the classical acquisitions process. Only a few scholars have the time or interest to read exhaustively in a subject area. Even today, few libraries attempt to collect exhaustively in many areas: rather they attempt to acquire important works in all areas.

If the library can extend its role, in the context of the electronic environment, of reliably assisting the user in selecting new works—either by rechanneling acquisitions expertise or by acting as a central point for collecting readers' opinions—then people will have a very good reason to continue to seek information through the medium of the library. Such repositories of opinion will allow the patron to continue to obtain materials in an environment where perhaps too much information (of greatly varying relevance and importance) is perhaps too easily available. Perhaps the open questions here are the scope of such repositories and the importance to users of direct human interaction. With current networking technology, it makes relatively little difference whether such repositories are local (distributed at the level of today's library), regional, or national. Arguably, they could also be distributed by area of specialization (one system for biology, another for historical fiction, etc.), but in this case classification of area could become a major problem for the user. As long as patrons want to be able to go and talk to human beings, there will continue to be a need for local libraries. And, of course, archival printed material will continue to be in demand locally for some time to come.

Until recently, a great library was one with a collection of great richness. Collection development, or acquisitions strategy, was the key to building and maintaining a great library. Today, with the introduction of online catalogs, we are seeing this concept change to incorporate a requirement for easy bibliographic access to the library's riches. The great research library of tomorrow will have to blaze new trails. The is-

sue perhaps will be less one of actual holdings than of the library's ability to provide the patron with access to a rich collection of materials. Much of this will revolve around the quality of the automated system available to the user, but just having such a system may not be enough. It seems likely that researchers within scientific communities may well become publishers in their own rights. Already today there is a vast "secondary" literature of technical reports, preprints, and the like familiar to all active research workers. Research libraries may have to go so far as to make direct arrangements to obtain this material from numerous research communities. Libraries themselves may take over some of the role of today's publisher, at least in scientific areas.

Electronic publishing will remake technical services. Much of the paper-shuffling side of today's technical services operation will vanish. In its place will be a new emphasis on the administrative/contractual and intellectual expertise components of technical services.

REFERENCES

1. Jerry Borrell, "The Shifting Meaning of Electronic Publishing: Pagination and the Printing Industry," *Electronic Publishing Review* 2:137-42 (June 1982).
2. Donald Knuth, *TEX and Metafont: New Directions in Typesetting* (Bedford, Mass.: Digital Press and the American Mathematical Society, 1979).
3. Robert A. Myers, "Printers for Electronic Document Distribution," in *Electronic Mail and Message Systems: Proceedings of the AFIPS Workshop on Technical and Policy Issues* (Arlington, Va.: American Federation of Information Processing Societies, 1981), p.139-51.
4. J. Tydeman and others, *Teletext and Videotext in the United States; Market Potential, Technology, Public Policy Issues*, Data Communications Series (New York: McGraw-Hill, 1982).
5. James Martin, *Viewdata and the Information Society* (Englewood Cliffs, N.J.: Prentice-Hall, 1981).
6. B. Shackel, "The BLEND System: Programme for the Study of Some 'Electronic Journals,'" *Journal of the American Society for Information Science* 34:22-30 (Jan. 1983).
7. Seldon W. Terrant, "Special Report: Publishing Scientific Information Today . . . and Tomorrow," *Chemical and Engineering News* 61:51-58 (Apr. 25, 1983).
8. P. L. Holmes, "Byproducts and Bonuses of Electronic Publishing," *Electronic Publishing Review* 1:35-42 (Mar. 1981).
9. P. L. Holmes, "The Re-use of Machine Readable Data and Copyright—A Pragmatic Approach to the Problems," in *4th International Online Information Meeting, 1980* (Oxford, England: Learned Information, 1981), p.1-13.
10. F. W. Lancaster and Julie M. Neway, "The Future of Indexing and Abstracting Services," *Journal of the American Society for Information Science* 33:183-89 (May 1982).
11. Ernest Perez, "Text Enhancement: Controlled Vocabulary vs. Free Text," *Special Libraries* 73:183-92 (July 1982).
12. Ithiel de Sola Pool, "The Culture of Electronic Print," *Daedalus* 111:27-28 (Fall 1982).
13. Richard M. Neustadt, *The Birth of Electronic Publishing: Legal and Economic Issues in Telephone, Cable and Over-the-Air Teletext and Videotext* (White Plains, N.Y.: Knowledge Industry Publications, 1982).
14. D. Russon, "The Impact of New Technology on Present Document Delivery Systems," *Electronic Publishing Review* 2:131-36 (June 1982).
15. Edwin B. Brownrigg and Clifford A. Lynch, "Online Catalogs: Through a Glass Darkly," *Information Technology and Libraries* 2:104-15 (Mar. 1983).

Electronic Publishing and Library Technical Services

Brian Aveney

In the next few decades, electronic publishing promises substantial changes in patterns of publishing and library organization. Trends in electronic editions, on-demand publishing, and online publishing are reviewed, and potential effects on library services and organization are discussed. Electronic publishing will tend to increase the emphasis on professional versus clerical tasks and public services versus technical services.

THE WORLD OF publishing is currently in a state of ferment, if not outright chaos. It seems that everything that anyone can imagine is happening in a rich tapestry of electronic pluralism. New information packages proliferate: videotape, videodisc, compact (audio) disc, videotex, teletext, hypertext, and numeric databases. New genres are emerging: docudrama, music video, video games, courseware, role-playing games, and interactive fiction, such as *Choose-Your-Own-Adventure* books.

Much of the literature of the future touts one development or another as the wave of the future. All of these attempts to define the future are inherently doomed. There will not be one future; there will be many. Some will exist concurrently, some consecutively. Frederick Kilgour was one of the earliest voices in library literature to note the computer's capacity to particularize, to address each individual separately.¹ This capability is being used to create a sort of electronic supermarket, where users can choose the kind of information package most hospitable to their current interests and to their individual tastes.

In this heterogeneous electronic Oz, does it make any sense to spend time identifying the yellow brick road? Richard DeGennaro has observed in many of his writings that it is foolish to spend a great deal of time and energy trying to prepare to control an as yet undefined future.² Without denying the wisdom of that advice, we may nonetheless wish occasionally to lift a weather-eye from our daily tasks and attempt to predict what storms might hit.

This essay is an attempt, not to predict a coherent and comprehensible future, but rather to identify threads of development and suggest ways in

The editor invited Brian Aveney, Director for Research and Development, Blackwell North America, Inc., to describe the future world of the technical services librarian that he anticipates.

which they might impact library operations. Given the multivariable and pluralistic nature of free-market development, attempts to attach firm dates to future events are necessarily closer to science fiction than scholarship. Still, it is not unreasonable to suggest some probable sequencing of events without attaching great value to expect-dates.

Paul Starr has categorized three major alternatives for future publishing: electronic editions, on-demand publishing, and online publishing.³ While Starr describes these as alternatives, they are not mutually exclusive and a given "publication" will often belong to more than one category.

ELECTRONIC EDITIONS

By *electronic editions* we mean "publications" that are inherently electronic and could not be contained within the traditional paper packages (books, journals) without loss of some portion of the message. In terms of library history, these electronic editions may be viewed as descendants of mechanical and electrical editions such as slides, audiotapes, and motion pictures. We will limit this discussion to electronic media that are distributed in physical packages, manufactured and distributed in editions.

For all the rhetoric about media freaks and "printists," librarians have adapted rather well to new physical media as they have appeared. It took a while to figure out that slides are best stored so that they may be scanned in groups on translucent trays or racks, rather than lifted one-by-one from trays. We've wondered which emerging media will prevail and seen investments in wire recorders and 8-track cartridges prove to be wrong guesses. We've wrestled with cataloging rules defined for print and extended only belatedly to other media. Still, our record is reasonably good; we have located, cataloged, stored, and retrieved these materials.

Just as we have provided slide viewers, film loop projectors, tape recorders, and phonograph record players in the past, so libraries are today adding videocassette recorders, compact disc players, videodisc players, and microcomputers for public use. While this proliferation of equipment can cause budgetary, space-planning, and procedural difficulties, these problems are similar to the ones we've successfully solved in the past. The task of providing adequate facilities for individually viewing videodiscs that will permit others in the library to work undisturbed is different only in detail from problems of organizing listening rooms or language laboratories. Identifying videocassettes or floppy disks that have been erased by borrowers is little different from checking phonograph records for scratches or motion pictures for bad splices. Our carrels may look somewhat different, but they will still require electricity, floor space, sound isolation, and a chair to sit on.

Sequentially viewed "scroll" media such as videocassettes and direct-access "codex" media such as videodiscs have differing viewing requirements. Scroll media are customarily viewed as a whole. For this reason, our bibliographic access will usually target the whole work, monographic cataloging in effect. Codex media are also often viewed as a

whole; the principal value of putting feature films on videodisc is its superior durability and quality of reproduction as compared to videocassette. But the direct access and freeze-frame capabilities of videodisc also make it appropriate for reference works and "magazines." How many analytical entries is it reasonable to make for the videodisc with all the paintings in the Metropolitan Museum of Art? Still, this question conceptually is the same as that of cataloging the reproductions in book form.

Electronic editions may make our reading rooms dissolve into vast egg crates of carrels. They may complicate our bibliographic apparatus. They may call for increasing ingenuity in our reference service. Nonetheless, libraries have always found a way to "mark it and park it," and electronic packages are still only packages. While details may change, the functions of the library will not be substantively changed because the shapes of the packages change. We will still select, acquire, organize, store, and circulate whatever packages the engineers and marketeers may produce.

ON-DEMAND PUBLISHING

On-demand publishing, or downloading as it is described in some literature, promises to affect library organization and functions dramatically. Anything that can be digitized can be transmitted electronically from central or regional storage over telephone lines, cable, or satellite links to an appropriate receiver. We can digitize today virtually any sound or image. Sony and the American Broadcasting Company have proposed to download encrypted movies to home videocassette records.⁴ Panasonic, National Public Radio, and Codart are developing a scheme for on-demand creation of music tape cassettes by encoded broadcasts to home tape recorders.⁵ For the new electronic media, the barriers to on-demand publishing or downloading are principally financial, legal, and organizational.

The major barriers to on-demand publishing of print materials are terminal or output device limitations and transmission costs. Current output devices present few barriers to coded transmission of the limited character sets used by newsletters and, because of commercial newsletters' typically high selling price to amount of text, transmission costs are not a major difficulty. The barrier to on-demand publication of newsletters is the lack of sufficient receivers. This problem is being addressed aggressively by Atari, Coleco, Texas Instruments, Tandy, Apple, IBM, and a host of camp followers and stragglers. We can reasonably expect the microcomputer with modem and printer to be nearly as prevalent in homes as television sets within the decade, and ubiquitous in business offices before that. Because of the intended high time-value of most newsletters, on-demand publication should be popular with those who have facilities for receiving them. A kind of technological imperative suggests that the many serious technical, legal, and financial questions will be resolved. By the end of this decade, the question for newsletters may be whether the printed version will have sufficient subscribers to make it an economically viable proposition.

Books and journals present greater hurdles. Considerable effort is under way on two fronts in electronic publishing of basically textual materials. The first addresses the intermixing of unlike kinds of transmissions from digitized voice and live-action images to encoded text and graphics. The second, more immediately pertinent to libraries, addresses the encoding of symbols not in our current computer fonts, such as mathematical symbols, corporate logos, diacritical marks, unusual letters, and hieroglyphs. In some cases, infrequently used symbols may be downloaded as scan lines or as mathematical descriptions and then addressed as encoded characters in later uses during the same transmissions.

Dot matrix and ink-jet printers do not provide sufficient resolution for a wide repertoire of symbols. High-quality impact printers, like daisy-wheel and type ball printers, cannot provide an adequate number of variations for mechanical reasons. xerographic, laser printing, and telefacsimile devices provide one reasonable development path. If we wed the low-cost xerographic copier to the solid-state laser, and add a modem and a microprocessor or two, we would have a device capable of producing any printed image we want.

When will on-demand printing of books and journals be here? We first need to agree upon standards for encoding symbols outside the normal character set. Then we need to have a sufficient number of active on-demand receivers to justify publishers' making texts available online, and we need a sufficient number of texts available to justify purchase of on-demand output devices.

On-demand publication will probably be applied to journal publishing before books because the user will often receive full text of only part of a given issue, minimizing transmission costs. Journals and books that are the least dependent on unusual characters or sophisticated illustrations will precede those more dependent. University press books and other small edition publications will precede trade publications, since printing and distribution are a high percentage of total costs for short runs.

Ithiel de Sola Pool has noted that, in an on-demand environment, "the reader will often throw away the paper copy as soon as it is read and get a duplicate from the terminal if he wants it again later, for it may be cheaper and easier than storing the paper to get the same document on paper many times."¹⁶ The disposable book promises to cause the most significant changes in library organization.

ONLINE PUBLISHING

With online publishing, users are given access to more current material than can be economically distributed in packages. Online publications are distinguished from on-demand publications in that the final product is not merely delivered on demand, but also shaped on demand. For example, producing a bibliography by searching an online database is different in nature from reproducing one already organized and stored in the ERIC system, a low technology, remote publication-on-demand scheme.

One of the most important and underestimated trends in electronic publishing is the move from passive, linear presentations to interactive systems. "Readers" of electronic publications can rearrange tabular data or text for their own purposes. They can run canned or individually programmed routines against databases and, in effect, create new data in so doing. This blurs the distinction between author and user. Video games are an extreme in interaction where the player becomes primarily reactive, an intelligent solenoid as it were. We are even seeing interaction devolve from electronics to print in the increasingly prevalent tree-structured mysteries and adventures and role-playing games popular with adolescents.

Speaking of interactive software, Paul Starr has noted that "computer games and instruction take advantage of these features; so also could a serious electronic literature. Although the new technology is now used mainly for didactic, fact-finding, and entertainment purposes, it may stimulate the development of new intellectual and artistic forms that may be partly read, partly played."⁷

Whatever the final shape of online publishing, there are two important questions for us: Will information be accessed in the library or in the home or office? Will users want librarians' assistance or do it themselves? The answer to both questions is probably yes. While there will be home use by sophisticated users, there also will be a need for library provision of these services for the foreseeable future. In a slightly different context, Kevin Hegarty has noted that "initial consumer experiences with newspapers and telephones were at public stations—drugstores, with public telephones; and for newspapers, coffee houses in the 17th and 18th Century England, which provided newspapers to customers. Public libraries could well become the public stations and coffee houses for VIDEOTEX."⁸

THE ON-DEMAND LIBRARY

It is difficult to predict a date when a sufficient amount of on-demand publication will relegate edition-printing to the dustbin. It is not likely to occur in this decade. It is highly likely to occur before the end of the next and within the projected active professional lifetime of many of us. It may be of some value to review our existing operations in light of a hypothetical purely on-demand publishing scenario.

SELECTION

The first and most obvious change is that instead of selecting materials in anticipation of demand, selection will be done on demand. Gone will be systematic collection development of new materials (our historical stores will continue). Selection will become a purely public service function. There is already an analog to this decoupling of the selection and collection functions in the online reference services libraries offer by using central databases that are not directly related to individual library collections.

The spread of the personal word processor and the increase in worldwide literacy will expand the number of potential authors. On-demand

publication eliminates the need for publishers for many authors and may increase self-publishing. Since publishing will be less capital-intensive, there may be more small-presses also. This proliferation of authors and publishers will increase the needs of users for selection assistance, both locational and evaluative.

To defend themselves against potential attacks, real and imagined, librarians have in recent decades adopted a defensive posture toward making "subjective" judgments. Patrick Wilson's essay, *Two Kinds of Power*, was one of the early works pointing out that this antiseptic approach to offering assistance is not what all patrons want.⁹ Offering subjective guidance is not a new concept for libraries; the readers' adviser position has existed in many libraries primarily to provide subjective, evaluative assistance for readers.

One implication of the separation of selection and collection may be the eventual deinstitutionalization of the librarian. Mary Lee Bundy¹⁰ and Robert Taylor¹¹ years ago pointed out that because librarians have been tied to institutional apron strings, they have been hindered from making certain kinds of contributions to society outside library walls. Larry Auld has written a provocative essay on the future of librarians as free-lance professionals, much like lawyers, whose assets are the abilities to negotiate a complex maze on their clients' behalf, not ownership of the mazes.¹²

ACQUISITIONS

Acquisitions librarians basically manage what John Naisbitt has termed the "information float," that is, the time between the acquisition decision and the delivery of the information.¹³ We have developed on-order files, claims, cancels, encumbrances, and management reports to help us manage these tools. In an on-demand environment, the information float is measured in minutes, not months. The four-minute on-order record may someday be a candidate for the *Guinness Book of Records*.

If on-order files, claims, cancels, and encumbrances disappear, what of the other steps in acquisitions? Verification will become one with selection as part of public services. There will still be a need for budget control, but in the electronic banking environment the cash float will disappear; all sales will be cash, in effect. The decision to pay becomes integrated into public services as is the case with interlibrary loan costs in most libraries today.

In the hypothetical purely on-demand publication environment, the acquisitions department will disappear.

CATALOGING

In a purely on-demand environment, there will be few additions to collections, and therefore few catalogers in libraries. There will remain a retrospective cataloging function which, over time, will merge with rare books, manuscript, and other special collections cataloging. There will, of course, need to be some cataloging done centrally by which the information utilities can make people aware of materials. Thus the catalog may become a sales tool instead of an inventory tool.

Specialized libraries may continue to build unique catalogs for high-value uses. This activity will tend to locate in public services much like the preparation of bibliographies today, since the emphasis will be on serving the needs of a specific group of users.

SERIALS

As serials decompose into databases of articles, the need to keep track of "issues" systematically will disappear. Items will be paid for as delivered, not by subscription. Analogs of current serial reference services will continue as part of public services.

CIRCULATION

When we stop acquiring, storing, retrieving, and reshelving on-demand printed books and journals for economic reasons, we won't need circulation files, overdue notices, recalls, or circulation statistics to guide collection development, or circulation departments to maintain these tools.

THE HOME PRINTER

If the device used to print on-demand publications becomes cheap enough, people may print their books at home. There already are a number of personal plain-paper copiers on the market costing less than \$1,000. Can the \$2,000 on-demand laser printer be very many years away? It may well precede the availability of very much material to print on it.

If people make their own books at home, the library will, over time, disappear. The librarian as readers' adviser or information counselor will continue to be important in inverse proportion to the sophistication and clarity of the online software used to access the on-demand electronic storehouses.

CONCLUSIONS

Anyone who makes firm predictions on exactly where electronic publishing will take us in the coming decades is tempting fate. Still, it is prudent to observe trends and project ways in which libraries might be affected. History has taught us that one of the most foolish attitudes any group can take is "it can't happen here." Electronic publishing has already had some effects on libraries and promises to do so increasingly.

In general, our analysis suggests that many of the custodial and clerical functions of libraries and librarians eventually will be assumed by electronic utilities, while demands for the professional tasks of locating and evaluating materials will increase. The focus of library activities will shift dramatically toward public services.

REFERENCES

1. Frederick G. Kilgour, "Evolving, Computerizing, Personalizing," *American Libraries* 3:141-47 (Feb. 1972).

2. Richard DeGennaro, "Libraries, Technology, and the Information Marketplace," *Library Journal* 107:1047 (June 1, 1982).
3. Paul Starr, "The Electronic Reader," *Daedalus* 112:148 (Winter 1983).
4. Pat Wadsley, "Sony Never Sleeps," *Video* 6:27 (Sept. 1983).
5. _____, "Nightbirds," *Video* 6:52 (Jan. 1983).
6. Ithiel de Sola Pool, "The Culture of Electronic Print," *Daedalus* 111:26 (Fall 1982).
7. Starr, "The Electronic Reader," p. 144.
8. Kevin Hegarty, *Public Library Association Video Task Force—Interim Report* (Tacoma, Wash.: PLA, 1983), p. 18.
9. Patrick Wilson, *Two Kinds of Power: An Essay on Bibliographic Control* (Berkeley, Calif.: Univ. of California Pr., 1968).
10. Mary Lee Bundy, "Crisis in Library Education," *Library Journal* 96:797-800 (Mar. 1, 1971).
11. Taylor stated his theme in many talks early in the seventies. The best statement in print is found in Robert Taylor, "Reminiscing about the Future: Professional Education and the Information Environment," *Library Journal* 104:1871-75 (Sept. 15, 1979).
12. Larry Auld, "Circulation One Hundred Years Later: An Address Presented at the Annual Conference, June 2036," *Information Technology and Libraries* 1:156-60 (June 1982).
13. John Naisbitt, *Megatrends: Ten New Directions Transforming Our Lives* (New York: Warner Books, 1982), p. 22-23.

Electronic Publishing, Libraries, and the Survival of Information

Gordon B. Neavill

This paper explores some of the problems that will confront librarians and scholars in a paperless society. Researchers have long been able to advance knowledge because of the stability of information preserved in the printed word. They will be denied this legacy with paperless information systems because data banks, stored in computers under the control of the commercial sector, can easily disappear or be significantly changed. An unplanned transition to electronic communication systems can seriously undermine scientific and scholarly communication and alter the role of libraries.

THE COMPUTER MAKES possible a fundamental change in the way recorded information is disseminated. For the first time in human history, it is possible to disseminate written messages to a scattered audience without reproducing the messages in multiple copies and distributing the copies across geographical space. In a computer-based, electronic information system, recorded information is stored in the memory of a central computer to which users with their own video display terminals have electronic access. Users of an electronic system who wish to retain a message have the option of transferring it electronically into their personal computer-based files. This is what F. W. Lancaster calls a "paperless information system."¹ The possibility of recording and disseminating written messages electronically, without having to rely on tangible physical objects as the medium of communication, is a revolutionary innovation with profound intellectual implications, not all of them salutary.

The advantages of computer-based, electronic information systems for certain purposes are compelling and real. One advantage is intellectual. Whereas print-based systems freeze data in a particular configuration, computer-based systems enhance the malleability of recorded information. Data stored in a computer memory can be updated, corrected, rearranged, or otherwise altered practically at will, and new data are easily interpolated into existing data. Users of such systems can manipulate and interact with recorded data, arranging the data to suit their individual needs. These features give computer-based, electronic

This article is based in part on a research report presented at a meeting of the Association of American Library Schools on January 7, 1983, by Gordon B. Neavill, Assistant Professor, Graduate School of Library Service, University of Alabama.

information systems powerful capabilities that print-based systems can never hope to match.

TECHNOLOGICAL DETERMINANTS OF INFORMATION SURVIVAL

Computer-based, electronic information systems appear to be a convenient and potentially economical means of distributing recorded information. Moreover, capabilities inherent in their technology enable computer-based electronic systems to meet information needs that print-based systems cannot satisfy. But a complete information system must do more than distribute information efficiently. Many kinds of communication require a system that also ensures the survival of recorded information. The malleability of information that is one of the major advantages of computer-based electronic systems has as its corollary the potential transience of information. Nothing inherent in the technology of computer-based electronic systems ensures that information in the system will survive.

In an electronic environment as described by Lancaster, recorded information may not exist in tangible form outside the memory of central computers. When information is freed from the confines of a physical container it is rendered vulnerable. It can be altered or revised without any indication that a change has been made. It can be purged from the system altogether. Information without a physical container cannot survive on its own. When information is purged from a computer-based electronic system, it is lost.

For ensuring that a recorded message will survive, the technology of printing has strong inherent advantages. Printed books, journals, and other artifacts in which information is recorded are physical objects. From the standpoint of the distribution of information, this is a disadvantage. You have to cope with all those physical objects to get at the information they contain. Printed books and journals have to be shipped from publishers' warehouses to wherever potential users happen to be. They have to be acquired, organized so users can find them, and stored. Exigencies of storage occasionally require that they be shifted from one location to another. Before they can be used, someone has to go to the storage area, remove them from the shelves, and carry them someplace else. Much time and effort are spent trying to keep track of their whereabouts; even so, they are frequently misplaced or lost. Only one user at a time has access to the intellectual content of a copy of a printed book or journal. Often when they are needed they are unavailable.

Yet the simple fact that recorded information in a print-based system exists in tangible form is a matter of considerable intellectual significance. The very characteristics that make printed books and journals cumbersome for the distribution of information are a positive advantage when it comes to ensuring the survival of information. The intellectual content of a printed book or journal cannot be erased or altered. It is likely to survive as long as the book or journal itself survives as a physical object. And because print technology involves the reproduction of texts in multiple copies that are then geographically dispersed, there is a high

probability that at least some of the copies will survive.

So far as I am aware, proponents of computer-based electronic systems have not addressed the issue of the long-term survival of information. Perhaps they are anchored intellectually in the world of print more than they realize. In our familiar print-based environment, the distribution and the survival of recorded information are so closely linked by the physical object in which information is recorded that we ordinarily don't think of them as separate issues. The distribution of recorded information necessarily involves the acquisition of the physical objects in which information is recorded. With the acquisition of these objects, the survival of information follows automatically, as long as the objects are retained. In an environment in which recorded information is distributed without a physical container, the link between distribution and survival is broken. The survival of information in an electronic environment becomes an intellectual and technological problem in its own right.

If computer-based, electronic information systems are to become complete information systems, not just handy devices for quick reference, personal or corporate record keeping, and short-term storage of current materials, it will be necessary consciously to design and build into them mechanisms to ensure the long-term survival of information. It is especially important that this be done if such systems are to play a role in formal scholarly communication.

THE LIBRARY'S INSTITUTIONAL ROLE

In the print-based environment, the library is involved in both the distribution and the survival of recorded information. Although one function may be emphasized over the other, they remain closely connected. As long as books were scarce and readers constituted an elite, libraries tended to be viewed as storehouses whose primary function was to ensure the survival of the society's cultural heritage. The old-fashioned librarian was first of all a collection builder who sometimes seemed to care more about protecting the books than encouraging and facilitating their use. Yet even in the most old-fashioned of libraries, underlying the acquisition of any book was always the idea—however vague—that it had potential value to someone.

As books became cheaper and more plentiful and literacy the norm instead of the exception, the emphasis shifted to the distribution function. New kinds of libraries came into existence, such as school libraries, many smaller public libraries, and some special libraries, that were concerned mainly with the distribution of current information. These libraries made little attempt to retain materials that were no longer in great demand. Research libraries of all kinds continued to contribute to the survival of recorded information, but this aspect of their role was less emphasized. Today, few librarians outside of national libraries, a small number of other research libraries of international significance, and special collections departments devote much conscious attention to the library's function of ensuring the survival of recorded information. Attention is focused instead on the information needs of users and how those needs can best be met. This is as it should be. In an environment

where information is recorded in physical form, librarians don't need to think much about the survival function. Apart from questions relating to the physical preservation of printed materials, one can say that if librarians take care of distribution, survival for the most part takes care of itself.

In an electronic environment, paying conscious attention to the survival of recorded information will be an urgent necessity. With this goes a renewed emphasis on the library's role as a social institution.

The survival of information in an electronic environment becomes an intellectual and technological problem in its own right.

The old debate over whether the library should be regarded as a social institution or a social agency was, in large part, a debate about which of the library's dual functions should receive primary emphasis. When Lowell Martin in 1937 defined the library as "an institution for the transmission of group culture and knowledge as recorded in printed materials," he acknowledged the importance of the survival function.² Twelve years later, Jesse Shera stated the case for viewing the library not as a social institution but as a social agency. "The distinction," he wrote, "is fundamental to complete understanding of the relation between the library and its social environment. Whereas the social institution is primary and basic, the social agency is secondary and derived. The family and the state are institutions; the school, the library, and the museum are agencies. The one determines the pattern of society, and the other is determined by that pattern."³

Shera's view lent theoretical support to the modern emphasis on the library as an agency through which recorded information and knowledge are distributed, and most librarians during the past thirty-five years have endorsed his position. On the whole, the view of the library as a social agency has been valuable and rewarding. It has focused attention on the importance of the social setting in shaping the development of libraries and the services they provide, and it has encouraged investigation into the information needs of various users and the kinds of services that best meet those needs. Its chief theoretical shortcoming is that it does not adequately account for the library's role in ensuring the survival of recorded information.

In an electronic environment, the view of the library as a social agency has dangerous policy implications. If the library is regarded merely as a social agency, one can argue that, if conditions change and other agencies come into existence that are able to distribute recorded information and knowledge more efficiently, then libraries could be supplanted and "wither away, their historic duty done," as one observer has expressed it.⁴

We need to begin thinking of the library as both a social agency and a

social institution. As a social agency the library is involved in the distribution of recorded information and knowledge. It is not the only agency with this function, but it has been and so far continues to be the most important. In its institutional role the library has no serious competition. The library is the primary social institution by means of which a society remains in contact with and in possession of its accumulated stock of recorded knowledge.

The library has served its institutional role in all literate societies, whatever their particular social environments have been. In this role the library is as basic to the fabric of society as are institutions like the family and the state. Remaining in contact with its stock of knowledge is a matter of fundamental importance to any society. Indeed, a society can be well defined in terms of its stock of knowledge and how that knowledge is distributed among its members.

THE STOCK OF KNOWLEDGE

The stock of knowledge of a nonliterate society cannot exceed that which can be held in the minds of its members. Since this knowledge remains available to the society only so long as it is transmitted directly from one mind to another, its long-term survival is never certain. With the advent of literacy, constructs of words and ideas can be recorded in physical form, and the potential stock of knowledge expands to include not only knowledge actively possessed in the minds of living human beings but also knowledge recorded in physical objects that remain available to the society.

The ability to store knowledge outside the human brain makes possible the cumulative growth of knowledge characteristic of literate societies. Our own stock of knowledge consists of the contributions of many previous generations together with what we have added. Some of the contributions of earlier writers continue to be widely read and cited. Other works are kept alive by relatively few readers. Many more slip from active possession altogether and survive only as physical objects on library shelves, awaiting the arrival of some Prince Charming (often in the guise of a doctoral student) to bestow a fleeting kiss of life. As Michael Polanyi has written, "Only a small fragment of his own culture is directly visible to any of its adherents. Large parts of it are altogether buried in books, paintings, musical scores, etc., which remain mostly unread, unseen, unperformed. The messages of these records live, even in the minds best informed about them, only in their awareness of having access to them and of being able to evoke their voices and understand them."⁵

Access to the accumulated stock of recorded knowledge, especially to that part of it which is no longer commercially available, is provided chiefly by libraries. This stock of knowledge is not a miscellaneous accumulation. So long as intellectual works are recorded in tangible form, the primary responsibility for defining and shaping a society's stock of recorded knowledge rests with its librarians. Private correspondence, corporate records, and other unpublished documents generally remain in the private possession of their creators or owners, outside the stock of

public knowledge. They enter the stock of public knowledge only if they are published or if they are acquired by libraries for their potential research value. Although the greater part of the stock of knowledge preserved in libraries consists of published works, publication alone does not ensure that a work will be acquired, cataloged, and retained. Some published works are thought by librarians to have insufficient value to justify their inclusion in library collections. If the place of a work in the stock of knowledge is not secured by bibliographic control in the broadest sense, it is relegated to a kind of limbo when it ceases to be commercially available. Yet as long as physical copies of the work survive, there is always the possibility that its place in the publicly available stock of knowledge can be secured retrospectively.

ELECTRONIC PUBLISHING AND THE STOCK OF KNOWLEDGE

The question facing us now is this: Would an electronic society, relying primarily on computer-based electronic systems for the storage and distribution of recorded information, be able to retain contact with its accumulated stock of recorded knowledge? Since information in a computer-based electronic system is not recorded in physical objects that have an independent existence of their own, it will survive only so long as it is retained in the system. Commercial vendors of such systems are concerned with the distribution of information in the marketplace. They may assume part of the library's role as an agency involved in the distribution of recorded information, but they are not likely to share the library's institutional commitment to the survival of information.

Three categories of information could be in danger. Formal contributions to scientific or scholarly literature for which there is little or no apparent demand might eventually be purged from the system. Nonscholarly writings that have served the primary purpose for which they were created and are no longer in demand would in all probability be purged, precluding their later use by scholars for secondary purposes. Finally, the continual updating of electronic reference works could mean the loss of noncurrent information.

. . . the primary responsibility for defining and shaping a society's stock of recorded knowledge rests with its librarians.

The role of the information vendor in an electronic society is comparable to that of a publisher. Publishers in the print-based environment do not keep books or other documents available forever. When the demand falls off, they are allowed to go out of print. There is no reason to assume that commercial vendors of computer-based, electronic information systems will behave differently from their counterparts in the print-based media. If retention of information in a computer-based system can no longer be justified in economic terms, it may be purged from the system. The problem is that these similar, perfectly rational deci-

sions on the part of the print publisher and the electronic information vendor have radically different implications for the stock of knowledge. Out-of-print books, to the extent that copies have been acquired, cataloged, and retained in libraries, continue to be available to scholars and anyone else who wishes to consult them. In an electronic environment, information no longer retained in a computer memory ceases to exist.

Of course, many of the circumstances that contribute to books or other information-bearing physical objects being declared out of print would not affect vendors of computer-based electronic systems. Print publishers have high warehousing costs to consider. Current tax laws in the United States discourage commercial publishers from carrying large inventories of backlist titles. Even if all copies of a printed book sell out, the level of continuing demand may be too low to justify a new printing. Vendors of computer-based, electronic information systems would face none of these problems. In an electronic environment, recorded information with a low but steady level of demand could remain commercially available indefinitely.

But many contributions to the stock of knowledge do not have a level of use that can be characterized as "low but steady." Highly specialized articles in scholarly journals may be read by a tiny handful of people when they first appear and referred to with extreme infrequency thereafter. Because of the cumulative nature of scientific knowledge, older contributions to scientific literature are hardly read at all. How often are nonclassic scientific articles published twenty, forty, or eighty years ago referred to today? A large part of the stock of knowledge preserved in libraries is dead or dormant knowledge retained for its archival value.

In a computer-based, electronic information system with full-text capacity, infrequently requested works would probably be stored offline in a kind of archival memory. Even though storage costs in such a memory would be very low, it would still cost something to retain works in the system. I have no idea what rate of demand would be necessary to justify retention in economic terms, and it may well be that inertia would militate against the selective purging of archival files. Nonetheless, I would be surprised if commercial vendors retained works indefinitely for which there was no apparent demand. Certainly the possibility exists that rarely or never requested works would be purged.

Would it matter if they were? A specialized article in an obscure sub-discipline may be of great significance to the handful of subsequent scholars whose work leads them into that area. Rarely consulted publications that are outdated or superseded continue to be significant to anyone interested in examining the development of a scholarly discipline. Older contributions to the scientific literature have obvious value to the historian and sociologist of science.

But it is also important to the practicing scientist that earlier contributions remain available. New knowledge occasionally leads to a reopening of old channels of inquiry that seemed to have been worked out, or were merely abandoned, or were rejected as invalid. The theory of continental drift put forth by the meteorologist Alfred Wegener in 1912 was rejected and even ridiculed until geophysical discoveries in the 1950s

lent it new credibility. Michael Polanyi has noted how his theory of the adsorption of gases, first published in 1914, was disregarded for nearly half a century until changing views about the nature of intermolecular forces permitted scientists to accept its validity.⁶ Precisely because of the cumulative and intricately interrelated structure of our scientific knowledge, with everything that we think we know, as Karl Popper has argued,⁷ being considered conjecture subject to criticism and refutation, and with earlier contributions being built on and superseded by later contributions, it is essential that the whole fabric be preserved. Only in this way can earlier work—and later contributions based on it—be reexamined in the light of current knowledge. Since we cannot predict where new discoveries will lead us, it is impossible to know which earlier contributions may eventually be subject to renewed scrutiny. All must be retained.

In an electronic environment, vendors of computer-based information systems would have to be strictly regulated to guard against any possibility that formal contributions to scientific and scholarly knowledge, however rarely used, might be purged. But many nonscholarly electronic texts probably would not be protected. The real problem in an electronic environment would be distinguishing between messages that are truly ephemeral and those that might later turn out to have value as source material for scholarly research.

In a completely paperless society in which all recorded messages were disseminated electronically, there is a high probability that many kinds of apparently ephemeral writings would be purged after they had served their primary purpose and ceased to be in demand. Literary and other works that failed to find or retain an audience might also be purged after a time. It would be undesirable and probably impossible to retain everything. Yet an ongoing electronic holocaust of this sort would be a disaster both for scholarship and for cultural life in general.

Many documents used by historians and other scholars are used for purposes quite different from those for which the documents were originally created. For example, to the extent that seventeenth-century sermons are read today, they are read primarily not for spiritual edification but in order to penetrate the mental world of human beings who lived three centuries ago. Reformation pamphlets, eighteenth-century chapbooks, nineteenth-century economic tracts, literature generated by social movements, such as the civil rights movement of the 1950s and 1960s or the women's movement of today, constitute the essential raw material of history. These documents survive for retrospective use by scholars primarily because they have survived as physical objects long after the primary purposes for which they were created are met. They survive long after their authors and publishers lose interest in them. And, having survived, they can then be used for secondary purposes never imagined by those who created them.

Vendors of computer-based, electronic information systems are not likely to retain information that has served its primary purpose and is no longer in demand just because some scholar sometime in the future might want to use it for some secondary purpose. I don't know what the

solution to this problem might be. Short of requiring that all messages entered into computer-based electronic systems be retained permanently, it would be necessary for libraries (which I assume would still exist) to transfer electronic texts of potential value to scholars into local archival memories while they were still current. The difficulty here is that the scholarly value of many documents does not become apparent until after their primary purpose has been served. How many people in the eighteenth century would have predicted that chapbooks and other ephemeral literature of the time would interest scholars two centuries later? How many people in December 1955 would have guessed that a local bus boycott in Montgomery, Alabama, marked the beginning of a movement that was to shake and transform the American social order and that the documents it generated would have great historical value?

Fortunately, the majority of nonscholarly texts are likely to be disseminated in printed form for many years to come. We may be able to postpone facing this problem until we have more experience in ensuring the survival of other kinds of electronic information. But librarians, scholars, and commercial information vendors should now be searching for a means of ensuring the survival of noncurrent information in online directories and other regularly updated electronic reference works. The printed versions of these works will begin to disappear in the very near future.

Consider a reference work like *Books in Print*. In its printed form, a new edition appears once a year. Because print technology freezes data in a particular configuration and because of the time needed to manufacture and distribute the edition, the information it contains is out of date on the day of publication and becomes increasingly so as the year goes by. Meanwhile, the universe that *Books in Print* aspires to document is changing every day. Prices change, new books are published, old books go out of print. If we rely on the printed version, we may not know about the changes until the next edition appears. The electronic version, on the other hand, can be updated continually. New information can be made available instantaneously. We can always have an up-to-the-minute knowledge of how things stand today.

But would we still be able to know how things stood in the past? When the new edition of a printed reference work like *Books in Print* comes out, we continue to have a record of what books were in print the previous year, and at what prices, because the old edition, being a physical object, does not cease to exist when the new edition replaces it. Back volumes of directories, yearbooks, and other regularly updated reference works provide documentation about the past that is of great value to scholars and generally is available nowhere else. Yet the *raison d'être* of such reference works is solely the provision of current information. They provide a retrospective capability only because the survival of information no longer relevant to the purpose for which it was created is an inherent feature of print technology.

It is this feature of print technology—a by-product, as it were—that makes historical research possible. In an electronic environment, we are likely to lose much of the retrospective documentation we now take for

granted, unless strict standards are promulgated that require that fairly complicated retrospective capabilities be built into online directories and other electronic current information services. This will not be easy. For an electronic information service to provide a retrospective capability comparable to the back volumes of a printed reference work, three distinct features would need to be incorporated. Entries that are no longer current (books that go out of print, members of an organization who die or drop their memberships, etc.) would have to be retained somewhere in the system. Many electronic information services will find it desirable to do this without mandatory standards, but some may not. A more complex problem is posed by the revision of information within fields of an entry. When the price of a book or an address in a biographical entry changes, the old information would have to be retained with an indication of when it was superseded. Finally, for many scholarly purposes something more than a large cumulative file of current and retrospective information is needed. A content analysis of the types of books available at a particular period or a study of how characteristics of the members of a professional organization changed over time would require that the database be designed so it could be reconstructed as it existed at any given time in the past. An electronic information service with these features would provide retrospective information far more efficiently than do back volumes of printed reference works.

In an electronic environment, we are likely to lose much of the retrospective documentation we now take for granted, unless strict standards are promulgated . . .

The difficulty is that a retrospective capability of this sort is irrelevant to the primary purposes for which current information services are created. Vendors may resist standards requiring that a retrospective capability be built into the system. Another difficulty is deciding who would bear the added cost it would entail. Yet the provision of some form of retrospective capability is imperative if the needs of future scholars are to be met. A possible alternative to an electronic retrospective capability would be a requirement that a computer output microform record of the database be generated at established intervals. This record would be comparable to the back volumes of a printed reference work, and its sale to research libraries could be a source of additional income to the vendor. Probably the best way to ensure the survival of noncurrent information in electronic reference works would be to tie the provision of some form of retrospective capability to copyright of the database.

Librarians and scholars may not be the only groups concerned about the survival of information in an electronic environment. I don't know to what extent legal scholars have begun thinking about these matters, but it would seem that an electronic environment would also have grave implications for the legal system, especially in terms of standards of evidence. In an electronic environment, legal evidence could easily be al-

tered or destroyed. Suppose, for example, I enter a libelous statement into a computer-based, electronic information system. Suppose then, having allowed the statement to have its effect, I delete it. The fact of my having committed libel remains. The evidence of the crime has vanished. Somewhat less dramatically, information also figures in civil cases of all kinds. Decisions are made, actions are taken, on the basis of information. If there is any legal question about those decisions or actions, it is important that we be able to present as evidence the information on which they were based. In an electronic environment, the ever-present possibility that information might have been altered could raise doubts about evidence submitted in a court of law. The routine updating of information could mean that information subsequently needed as legal evidence might no longer exist.

Even if computer-based electronic systems are designed in such a way as to ensure the survival of information for scholarly and other uses, one problem remains. Not all vendors of computer-based, electronic information systems will be successful. They will be subject to the same forces that affect other enterprises; some of them will go out of business. What happens then to the portion of the stock of knowledge for which they were responsible? When a print publisher goes out of business, the publications issued over the course of its existence continue to be part of the stock of knowledge available in libraries. When an electronic information vendor goes out of business, information in the memory of that vendor's computers could cease to be available, either temporarily or permanently. Some provision will have to be made to counteract this possibility. The establishment of a public corporation to assume the assets of bankrupt information vendors is not an attractive idea, but I don't know what else to propose.

Finally, the fact that a significant portion of the stock of knowledge in an electronic environment would not exist in tangible form outside the memories of central computers raises preservation issues that are even more complex and difficult than those in the print-based environment. In the print-based environment, we have to be concerned about the preservation of the physical objects in which information is recorded, and, if these are beyond saving, with the transfer of their intellectual content to other media such as microforms or optical discs and video-discs. Even though many printed documents are actively disintegrating on library shelves, the fact that most printed documents exist in multiple copies—some of which have deteriorated less than others, depending on the conditions of their storage and use—means that there is a good chance of salvaging the intellectual content of endangered documents, if not the documents themselves.

Although certain forms of computer memory may be superior to paper and print for long-term storage, information in a computer memory remains vulnerable. It remains vulnerable because it may exist in only a single copy or, with backup capability, in a very limited number of copies. In this respect, an electronic environment resembles a nonliterate society, where the society's vital religious myths, literary creations, and genealogical traditions may be preserved in complete form in the minds

of a handful of individuals. Just as a nonliterate society takes great pains to ensure that these individuals survive to pass on their knowledge to the next generation, it will be necessary in an electronic environment to pay special attention to the protection and care of computer memories. Otherwise, a single disaster could decimate a portion of the stock of knowledge.

We'll need to know with precision and certainty how reliable various forms of computer memory are for long-term storage, and we'll need to determine how many backup copies are necessary (and how they should be stored) to have reasonable assurance that information will not be lost through technological mishaps or disasters of other kinds. We can't risk allowing an earthquake or fire to destroy the only copy of scientific or scholarly knowledge. We also need backup copies to guard against the possibility that modern-day Luddites could enter a computer facility and destroy a portion of our scientific knowledge, or that the stock of knowledge itself could be held at ransom by political terrorists.

OTHER ISSUES

The survival of recorded information is not the only issue of intellectual consequence raised by the advent of computer-based electronic information systems. The ease with which messages can be recorded and disseminated in an electronic environment may result in an enormous increase in the amount of low-quality information entering the stock of public knowledge. Certain intellectually important distinctions that are made automatically when works are recorded and disseminated in tangible form could be blurred. Bibliographic control is likely to be a more complex problem than it is now.

The linkage of individual computers in an electronic environment will allow anyone who invests in a small amount of supplementary equipment to become an electronic publisher. Alongside major information vendors are likely to be a large number of individuals disseminating works they have written or compiled themselves. Some of this material will be valuable, as is much self-published work today in areas like jazz discography. Much of it will be garbage. Little of it will have been assessed by editors or referees, or, if it has been so assessed, it may be self-published after having been rejected by the gatekeepers of established publishers. A tidal wave of self-published works of disparate quality, many of which may have a transitory existence, would place great strains on the system of bibliographic control. To distinguish works of value, some kind of qualitative evaluation might have to become part of the bibliographic control process. Because standards and regulations designed for commercial vendors would be difficult to apply to individuals, special steps to ensure the survival of self-published works of lasting value might have to be taken.

Publication is the process by which a work passes out of the private possession of its author and is made available to the public at large. In the print-based environment, publication involves reproducing a recorded work in multiple copies and distributing the copies to consumers. In an electronic environment, it involves entering a work into a

computer-based information system to which the public has electronic access. Since the freezing of data in a particular configuration is not inherent in the technology of such systems, publication in an electronic environment will have rather different intellectual implications than it does now, both for bibliographic control and for intellectual life in general.

In the print-based environment, an author may write several drafts of a work, circulate it among friends and colleagues for comment, even deliver it orally at a meeting before publishing a final version. So long as the author controls access to the work, it has not fully been made public. Publication implies that the work has been completed or has evolved to a point at which the author is willing to stop working on it. In an electronic environment, works in progress can be made available to the public at large, either for discussion and comment or to disseminate new information quickly. The publication of such works has disturbing implications for bibliographic control, which in the print-based environment has been concerned primarily with completed works in (or about to enter) the stock of public knowledge. It is difficult enough to organize, describe, and provide appropriate access points to works fixed in tangible media; to extend bibliographic control to works whose content, subject emphasis, and titles may be in a state of flux will be a challenge of staggering proportions.

Distinctions between a work in progress and a completed work, and between the original edition of a published work and revised editions, will be blurred in an environment where content is not frozen and revisions can be made at any time. In the print-based environment, a clear line of demarcation is drawn when a work is set in type. Once corrections are made at the proof stage, the content is fixed in the form in which, for better or worse, it will be released to the public. To revise a work after it has been published, type must be reset and a new printing made, resulting in a separate, clearly defined edition. These characteristics of printed communication are intellectually significant. They make it possible to cite passages in printed works with the assurance that the content of those passages will remain unchanged and accessible to future readers. They make it possible to document the changes made in the content of new editions. To a large extent, they make cumulative scholarship possible. If the intellectual content of scientific and scholarly publications remains potentially in flux and subject to revision at any time, citations to those publications could be rendered meaningless, and it would be perilous to rely on findings or conclusions in those publications as the basis for subsequent investigation.

Although computer-based, electronic information systems may not supersede the printed word as the primary medium for written communication, there is little doubt that they will be an increasingly important part of the information environment. To the extent that they are used for formal scientific and scholarly communication or for the communication of information of potential interest to scholars, the issues raised in this paper will need to be addressed. Otherwise, the tradition of

cumulative scholarship could be undermined, and the continual updating of information could mean an ongoing obliteration of the past.

REFERENCES

1. F. W. Lancaster, *Toward Paperless Information Systems* (New York: Academic Press, 1978).
2. Lowell Martin, "The American Public Library as a Social Institution," *Library Quarterly* 7:549 (1937).
3. Jesse H. Shera, *Foundations of the Public Library: The Origins of the Public Library Movement in New England 1629-1855* (Chicago: Univ. of Chicago Pr., 1949), p.v.
4. Hugh Folk, "The Impact of Computers on Book and Journal Production," *The Economics of Library Automation: Proceedings of the 1976 Clinic on Library Applications of Data Processing*, ed. J. L. Divilbiss (Urbana, Ill.: Univ. of Illinois, Graduate School of Library Science, 1977), p.79.
5. Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: Univ. of Chicago Pr., 1958), p.375.
6. ———, "The Potential Theory of Adsorption," *Science* 141: 1010-13 (1963); reprinted in his *Knowing and Being: Essays by Michael Polanyi*, ed. by Marjorie Grene (Chicago: Univ. of Chicago Pr., 1969), p.87-96.
7. Karl R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*, 2d ed. (New York: Basic Books, 1965).

Statement of Ownership and Management

Library Resources & Technical Services is published quarterly by the American Library Association, 50 E. Huron St., Chicago, IL 60611. Annual subscription price, \$10. American Library Association, owner; Elizabeth L. Tate, editor. Second-class postage paid at Chicago, Illinois. Printed in U.S.A. As a nonprofit organization authorized to mail at special rates (Section 132.122, *Postal Service Manual*), the purposes, function, and nonprofit status of this organization and the exempt status for federal income tax purposes have not changed during the preceding twelve months.

Extent and Nature of Circulation

("Average" figures denote the number of copies printed each issue during the preceding twelve months; "Actual" figures denote number of copies for single issue published nearest to filing date—the July/September 1983 issue.) *Total number of copies printed:* Average, 9,702; Actual, 9,548. *Paid circulation:* not applicable (i.e., no sales through dealers and carriers, street vendors and counter sales). *Mail subscriptions:* Average, 8,611; Actual, 8,564. *Free distribution by mail, carrier or other means, samples, complimentary, and other free copies:* Average, 867; Actual, 851. *Total distribution:* Average, 9,478; Actual, 9,415. *Copies not distributed: office use, leftover, unaccounted, spoiled after printing:* Average, 224; Actual, 133. *Returns from news agents:* not applicable. *Total (sum previous three entries):* Average, 9,702; Actual, 9,548.

Statement of Ownership, Management and Circulation (PS form 3526, July 1982) for 1983 filed with the United States Post Office, Postmaster in Chicago, September 30, 1983.

IN MEMORIAM: JOHN W. CRONIN

February 10, 1905–November 24, 1983

Like youngsters who cannot imagine a world without computers, TV, or 747s, technical services librarians entering the profession today know nothing of a world without such instruments of bibliographic control as the national union catalogs and *New Serial Titles*. The man primarily responsible for transforming committee recommendations into these realities died in Washington, D.C., on Thanksgiving Day.

John Cronin's ability to accomplish his goals had a beneficial effect on technical services librarianship from his first administrative position in the Library of Congress Card Division until he retired in 1968 as Director of the Processing Department. It was he who recognized the importance of LC's catalog card service to other libraries and whose efforts to improve its efficiency included such innovations as the preassigned card number, the "All the Books Program," the "Cards with Books Program," and Shared Cataloging. The Library of Congress book catalogs are virtually synonymous with John Cronin's name, for it was he who supervised their development from the first *Catalog of Books Represented by Library of Congress Printed Cards* to the cumulative national union catalogs, which, with their supplements, provide catalog entries for book and nonbook materials in the research libraries of this country. That his accomplishments are far more numerous than those just mentioned is readily apparent from the tributes in "The Age of Cronin," published in *LRTS* at the time of his retirement (Fall 1968, p.387-405).

John Cronin's work made him no stranger to Resources and Technical Services Division. He was for many years an influential member of the Board on Cataloging Policy and Research and its successor, the CCS Cataloging Policy and Research Committee. His name appears also on the membership roster of the ad hoc National Union Catalog Committee. His practical solutions to problems of bibliographic control, implemented with boldness and imagination, made John Cronin inevitably a candidate for the Margaret Mann Citation, which he was awarded in 1961. In 1964 he received the Melvil Dewey Medal also.

John Cronin will be remembered by those associated with him professionally as a colorful and dynamic personality. He was a forceful communicator, who expected a great deal from himself and from those who worked for him. Beneath his apparent brusqueness, however, one found a very generous and kindly person, whose encouragement and assistance could sometimes make the difference between the success or failure of a project. The world has been the better for his having traveled here.—
Elizabeth L. Tate, Editor, LRTS.

INSTRUCTIONS TO AUTHORS

Please follow these procedures for manuscripts to be submitted to *Library Resources & Technical Services*:

1. Submit original, unpublished articles only. Do not submit manuscripts being considered for publication elsewhere. Articles of four to six thousand words on subjects of interest to technical services librarians are preferred.
2. Write the article in a grammatically correct, simple, readable style. Remember that the author is responsible for the accuracy of all statements in the article.
3. Give the article a brief title; if the title is not descriptive of the content, add a brief subtitle. On a separate page give the title, the name(s) of the author(s), and the title and affiliation of each. If the paper has been presented at a conference (the proceedings of which will not be published), identify the conference by name and date on the cover page.
4. On a separate page, type the title and subtitle, followed by a brief abstract, typed double-spaced. Do not identify the author(s) here or elsewhere in the manuscript.
5. Type the manuscript, double-spaced, on 8¹/₂-by-11-inch nonerasable paper. Please TYPE ALL QUOTED TEXT DOUBLE-SPACED.
6. Consult *Webster's Ninth New Collegiate Dictionary*, supplemented by *Webster's Third International*, for spelling and usage; prefer the first spelling. Verify the spelling and accuracy of names in an appropriate reference; don't rely solely on your memory.
7. Consult *The Chicago Manual of Style*, 13th ed., rev. and expanded (Chicago: Univ. of Chicago Pr., 1982) for capitalization, abbreviations, etc.
8. Follow the examples and suggestions in chap. 12 of *The Chicago Manual* in designing tables. Submit each table on a separate page at the end of the paper. Indicate the preferred placement in the text with an instruction in brackets. Use tables sparingly and provide each with a brief, meaningful caption. TYPE TABLES DOUBLE-SPACED THROUGHOUT.
9. Be prepared to supply camera-ready copy for each illustration, if your paper is accepted. Accompany the manuscript with a photocopy of each, with a brief, meaningful caption noted on the verso.
10. Submit all bibliographic citations on separate pages at the end of the article. PLEASE TYPE ALL "REFERENCES" DOUBLE-SPACED. Use superscript numbers throughout the text, but do not type the numbers as superscripts in the "References" and do not indent the first line. Use "References" to document the text not to amplify it. Note that a shortened form (not *op. cit.* or *loc. cit.*) is used for subsequent references to a previously cited work. If no other reference intervenes, use "Ibid." to take the place of the elements of the previous reference that apply. Do not underline "Ibid." A reference to another article from a previously cited collection can be shortened by means of a cross-reference. VERIFY EACH CITATION CAREFULLY.

The fictitious examples below illustrate the preferred style.

1. Robert Gardner and Julia Rowe, "A Practical Method of Automatic Indexing," *Library Resources & Technical Services* 31:284-98 (July/Sept. 1987).
2. Neville A. Fisher and others, *Publishing Patterns of the Next Decade*, Libraries of the Future, V.2 (Westport, Conn.: Coronada Univ. Pr., 1986).

3. Ibid., p.194.
4. Michael R. Culver, "Cataloging at Home with a Microcomputer," in *Technical Services Tomorrow; Proceedings of a Colloquium on March 13, 1988*, ed. Charles R. Datum (Chicago: American Library Assn., 1989), p.205-25.
5. Gardner and Rowe, "A Practical," p.290.
6. Jo Anne Quoddy, "Problems in Sending Publication Orders by Space Shuttle," in *Technical Services* (see ref. 4), p.84-96.
11. Send the original and two photocopies of your manuscript to Elizabeth L. Tate, Editor, LRTS, 11415 Farmland Dr., Rockville, MD 20852. Allow a minimum of two months for refereeing and editorial review. Please include an addressed envelope, large enough and with sufficient postage for the return of your manuscript. Overseas contributors need send one copy only and no envelope is required.

The LRTS editorial office in general follows the *Guidelines for Authors, Editors and Publishers of Literature in the Library and Information Field*, adopted by the American Library Association Council in 1983 and available from the ALA Executive Offices. Information about copyright policies also is available at ALA Headquarters.

INDEX TO ADVERTISERS

Advanced Library Systems, Inc.	97
ALA	98, 102
Baker & Taylor	99
Ballen Booksellers Int'l., Inc.	93
CLASS	94
EBSCO	96
Forest Press	104
Gale Research Co.	4th cover
Gaylord	100
General Research Corp.	2d cover
Inforonics	95
McGregor	94
Midwest Library Service	96
Multiprint, Inc.	93
Pergamon Press	101
Research Publications	103
TPS Electronics	93
University Microfilms Int'l.	52-53
University Products, Inc.	95
H. W. Wilson Co.	3d cover

TPS Electronics
announces
PC-300
Bar Code Reader
for
IBM PC

An addition to our
standard readers and
interfaces for OCLC and
RLIN cataloging terminals

4047 Transport
Palo Alto
California
94303
415-856-6833

**MULTIPRINT YOUR
OWN BOOK CATALOG**

Union List, Directory or
Bibliography in fifteen
working days. From *com-
puter photocomposition*,
line printer or other *line
copy ready for camera*.
Write with your specifica-
tions including number of
copies, number of pages
and page size for Quota-
tion, free Production
Guide and Sample Book
Catalog. Mention *LRTS*
for favorable price. Multi-
print, Inc., 28 West 23rd
Street, New York, NY
10010, (212) 924-1100.



Continuation/Standing Order Service

A new benchmark in...

**Serials Data
Management and Control Systems**
Tomorrow's Answer Today.

- Customer Reports
- History Reports
- Management Reports
- Automatic Claiming
- Collective Claiming
- Check-In Claiming

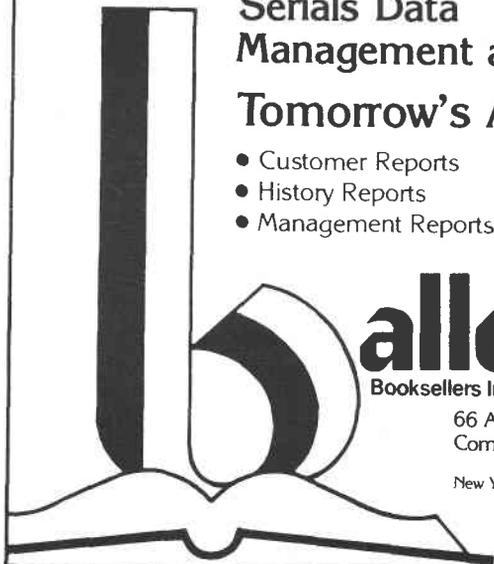
For additional details write or call:

allen

Booksellers International, Inc.

66 Austin Boulevard,
Commack, New York 11725

New York State Toll-free WATS (800) 832-4552
Toll-free WATS (800) 645-5237



Online Access to
Some of the World's
Greatest Libraries

RLIN

- More than 10 million bibliographic records
- Subject searching & free text retrieval
- Integrated cataloging & acquisitions system
- Search access using any standard terminal

Any library may have search or shared cataloging access to the Research Libraries Information Network (RLIN). Contact CLASS.

CLASS 1415 Koll Circle, Suite 101 San Jose, CA 95112-4698 (408) 289-1756

"PERSONALIZED" SUBSCRIPTION SERVICE

McGregor can simplify complex and time consuming problems of periodical procurement involving research, ordering, payments, renewals and record keeping. Prompt courteous service has been a tradition with McGregor since 1933. Our customers like it; we think you will too.

- All domestic and foreign titles
- Title Research
- Prepaid Subscriptions
- Automatic Renewals
- Personal Service Representatives

Call or write for catalog today
815/734-4183

MCGREGOR
Magazine Agency
Mt. Morris, Illinois 61054

DON'T WAIT— AUTOMATE



MARC II cataloging and on-line catalogs for books, journals, and private files.

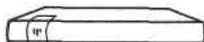
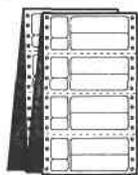


Book, COM, and card catalogs; printed holdings and accessions lists.

Automate with Inforonics: we've been around the longest and we still cost the least.

Inforonics

550 Newtown Road, Littleton, MA 01460
(617) 486-8976



**PROBLEMS WITH
LABELS
PEELING??**

NEW PRODUCTS...

WRITE FOR FREE SAMPLES!!

WE HAVE THE ANSWER!

University Products has introduced a new foil-backed Spine Label that really sticks! Manufactured with a superior combination of advanced high tack adhesive technology and foil-backed smudgeproof paper that retains the shape of the application while providing a superior cold application pressure sensitive label.

MINI/MICRO COMPUTER LIBRARY SUPPLIES

FREE sample package of our new line of computer Supplies for libraries, specifically designed to provide superior operation in micro computers. Includes our new "Smooth-Perf" continuous catalog cards, continuous processing labels, continuous interlibrary loan forms and more!



NAME: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP: _____

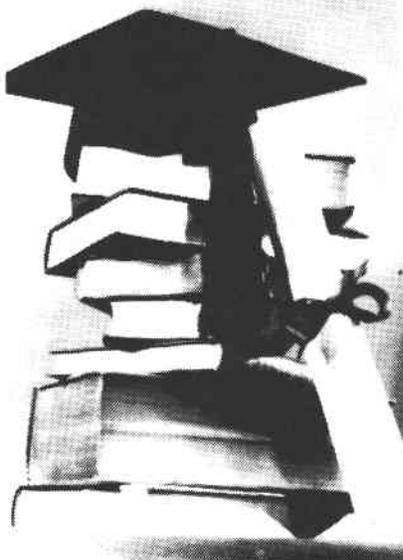


**UNIVERSITY
PRODUCTS, INC.**

P.O. BOX 101
SOUTH CANAL ST.
HOLYOKE, MA 01041

- LABEL SAMPLES
 COMPUTER SUPPLIES PKG.
 LIBRARY SUPPLIES CATALOG

Midwest Library Service



**You won't find
a wider selection
... anywhere**

College and university librarians: Midwest Library Service has what you're looking for. With 24 years of experience in the field, Midwest can supply you with virtually any book you want—even one from the smallest, most obscure publisher. This includes nearly all U.S. and Canadian publishers, U.S. distributors of foreign published works, university presses, non-profit organizations, private associations, and societies, in addition to many reprint publishers and paperbacks. You won't find a wider selection of books your library wants, whether you're a small college or a large university. Midwest Library Service has what you're looking for!

For additional information, call the
TOLL-FREE WATS NUMBER: (800) 325-8833
Missouri librarians call toll-free (800) 392-5024
Canadian librarians call collect (314) 739-3100



Midwest Library Service

11443 St. Charles Rock Road
Bridgeton, MO 63044

PLAIN AND SIMPLE

Our physical size and financial strength—necessary to make and honor commitments—indicate the successful working relationships we have with thousands of libraries worldwide.

But the plain truth is, simply, that it is our sensitivity to your unique requirements, and our flexibility in providing an exhaustive and relentless effort for total customer service that is our real strength.

We want to work with you—to help you provide exceptional patron service, which is your strength.

We can help. Write today—

EBSCO SUBSCRIPTION SERVICES

The Serials Professionals



P.O. Box 1943
Birmingham, AL 35201
(205) 991-6600
Telex: 78-2661

The new computer-produced Library of Congress National Union Catalogs on Advanced Library Systems microfiche offer expanded coverage, more flexibility, more convenience and more effective searching capability than has ever been possible before. Yet the low cost makes them accessible to libraries of all types and sizes.

State-Of-The-Art Efficiency For Your Library.

The new NUC Books is in index/register format. Now you can search the comprehensive collection of current catalog records produced by the Library of Congress and some 1500 North American libraries not only by name, but by title, subject and series as well. The indexes are cumulated each month. A single look-up will complete a search in most cases. The full bibliographic record can then be located in the register in seconds.

The new NUC microfiche can be used alone as a primary bibliographic source, or to complement your other bibliographic tools for cataloging, acquisitions, inter-library loans, bibliographic verification, reference and research.

Current LC Subscriptions/Free Trial.

ALS can also provide current subscriptions to the LC NUC U.S. Books; Audiovisual Materials; Music, Books on Music and Sound Recordings; Cartographic Materials; Register of Additional Locations; LC Subject Headings; and Name Authorities. ALS offers a free 30-day trial to introduce you to the benefits of a current subscription.

Retrospective LC Catalogs.

ALS is the only source for the complete microfiche retrospective collection of the LC NUC from 1898; Subject Catalog from 1950; Audiovisual Materials from 1953; and Music,

Books on Music and Sound Recordings from 1953. Our new, low prices make it possible for more librarians to acquire the complete collection or individual segments.

This year, take a giant step toward better bibliographic control. Keep your National Union Catalogs on ALS microfiche. They're surprisingly affordable. They reduce shelf space over paper catalogs by 94%. And they offer more efficiency than ever before.



ADVANCED LIBRARY SYSTEMS, INC.

93 Main Street
Andover, MA 01810
(617) 470-0610

FREE SAMPLE! Please Send Me A Free ALS Microfiche ... and more information on your:

Current Subscriptions National Union Catalog
 Subject Catalog Music Catalog
 Audiovisual Catalog
 Please have a representative call me:

LKTS _____

Name _____ Title _____

Organization _____

Address _____

City _____ State _____ Zip _____

The Biggest Advance In Bibliographic Control Is Just One Small Step Away.

ALA publications for technical services— from rare book restoration to real-time processing!

Technical services departments are responding to old and new challenges—a single deteriorating binding, retrospective conversion of an entire catalog. Publications of the American Library Association provide directly useful procedures and suggestions for deeper theoretical study.

Please write to request your copy of the **1984 ALA Checklist of Publications** or the new catalog **Sources in Librarianship and Information Science.**



AMERICAN LIBRARY ASSOCIATION

Publishing Services
50 East Huron Street
Chicago, Illinois 60611
(312) 944-6780

A Reader on Choosing an Automated Library System, edited by Joseph R. Matthews. Key articles treating the consideration, selection, implementation, and evaluation of automated library systems. 1983

0-8389-0383-5 ix, 390p.
\$35.00 paper.

Automated Circulation: An Examination of Choices, edited by Joseph R. Matthews and Kevin E. Hegarty. Papers from librarians, consultants, and vendors at a LAMA-sponsored conference on considerations fundamental to automating a circulation department. Spring 1984

0-8389-0402-5 Approx. 140p. \$15.00 paper.

Restoration of Leather Bindings, revised edition, by Bernard C. Middleton. Practical guide to the restoration of leather book bindings reflecting advances in techniques and materials. Spring 1984

0-8389-0391-6 Approx. 256p. \$25.00 paper (Available in the UK, Europe, and Israel from Eurospan, London.)

Guidelines for Handling Library Orders for Inprint Monographic Publications, second edition.

Prepared by the Bookdealer-Library Relations Committee of the Resources and Technical Services Division of the ALA. 0-8389-3299-1. (In preparation for publication in 1984.)

Anglo-American Cataloguing Rules, second edition, revisions adopted in 1983. Prepared by the Joint Steering Committee for the Revision of AACR2. 0-8389-0033-9.

(In preparation for publication in 1984.)

Additional titles of interest to technical services librarians:

Procedures for Library Media Technical Assistants, by Barbara Chernik. 1983

0-8389-0384-3 xiii, 280p. \$25.00 cloth
Introduction to Automation for Librarians, by William Saffady. 1983
0-8389-0386-X viii, 304p. \$35.00 cloth.



**YOU'LL ADVANCE CONFIDENTLY
IN THE WORLD OF TECHNOLOGY
... WHEN YOUR ON-LINE SYSTEM
IS BASED ON LIBRARY KNOWLEDGE**

Baker & Taylor's LIBRIS II On-Line Acquisitions System represents state-of-the-art technology coupled with 155 years of library experience.

Only Baker & Taylor can offer a complete acquisitions system featuring:

- *electronic ordering from the nation's largest stock of books*
- *a 700,000+ title database*
- *automated open-order control*
- *automated fund accounting*

For details, contact the Sales Department of the division nearest you. LIBRIS II, only from Baker & Taylor.

EASTERN . 50 Kirby Avenue, Somerville, NJ 08876, (201) 722-8000

MIDWESTERN . 501 S. Gladiolus Street, Mokenca, IL 60954, (815) 472-2444

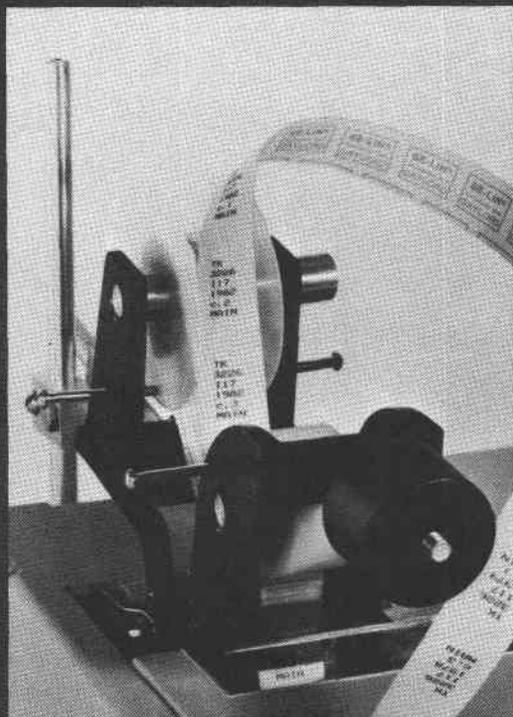
SOUTHERN . Mt. Olive Road, Commerce, GA 30599, (404) 335-5000

WESTERN . 380 Edison Way, Reno, NV 89564, (702) 786-6700

EXPERIENCE YOU CAN DEPEND ON

BAKER & TAYLOR

a GRACE company



The SE-LIN System can rapidly produce large quantities of labels that are permanently heat sealed to the spine of the book. A protective overcoating prevents smudging, making labels easier to read.

This advanced system, with improved tracking, is the most efficient, accurate and economical method of permanent spine labeling.

For more information call
Toll Free 1-800-448-6160

The New **SE-LIN**[®] Book Labeling System

Now works with
Computer Printers
Electronic Typewriters
Fixed Carriage
Typewriters

GAYLORD
the
TrustedSource

P.O. Box 4901 • Syracuse, NY 13221

Finding it tough to keep up
with new developments in
information technology?

Then you need

Subscribe now
for 1984 and
receive Volume 1 (1983)
FREE!

ELECTRONIC PUBLISHING ABSTRACTS

a tailor-made information service designed to
bring you news of the most modern and
up-to-date technology in:

- Printing • Office automation • Publishing
- Communications • Computerization

The monthly **Electronic Publishing Abstracts** journal provides a unique service tailored to the needs of publishing and allied trades by drawing together, in one source, summaries of the scientific and technical literature on information technology and electronic publishing.

Electronic Publishing Abstracts is developed by Pira, the UK research association for the paper and board, printing and packaging industries, and the International Electronic Publishing Research Centre (IEPRC).

To find out how **Electronic Publishing Abstracts** can help you, write now for further information and samples to:

Adam Marshall, Marketing Dept, Pergamon Press Ltd,
Headington Hill Hall, Oxford OX3 0BW, UK

or

Wayne Smith, Journals Fulfillment, Pergamon Press Inc,
Fairview Park, Elmsford, NY 10523, USA

EPA is also available as a computerized on-line service through Pergamon InfoLine. For further information about this service, contact:

Pergamon International Information Corporation, 1340 Old Chain
Bridge Road, McLean, VA 22101, USA.



P E R G A M O N P R E S S

Information management resources

from the American Library Association

Online Searching Technique and Management

Edited by
James J. Maloney

All facets of reference service using online searching, from the reference interview to financial management, are treated in this collection of seventeen papers.

0-8389-3285-1 vii, 195p.
\$25.00 paper 1983

A Reader on Choosing an Automated Library System

Compiled and edited by
Joseph R. Matthews

A series of forty key articles pertaining to the consideration, selection, and implementation of automated library systems.

0-8389-0383-5 Approx. 400p.
\$35.00 paper November 1983

DISTRIBUTED BY THE ALA

Directory of Information Management Software for Libraries, Information Centers, Record Centers

Compiled and edited by
Pamela Cibbarelli, Carol Tenopir,
and Edward John Kazlauskas

Basic information on available software options according to various criteria such as hardware, record format, size, and cost.

0-913203-00-9 133p. \$45.00 paper 1983
(published by Cibbarelli and Associates,
Inc., Studio City, Calif.).



Address orders and inquiries to
American Library Association
Publishing Services
50 East Huron Street
Chicago, Illinois 60611

The Washington Post

On Microfilm... From Research Publications

The Washington Post is the leading communications medium in the U.S. capital, as well as one of the foremost news publications in the world. It has been a chronicler of national and international events, as well as a newsmaker in its own right. Such an important journalistic record is an essential reference tool for any library today.

The entire contents of *The Washington Post* — news, editorials, columns, letters, and reviews are microfilmed and shipped monthly by Research Publications. An annual subscription for the current year is only \$740. *The Official Washington Post Index*, a

convenient guide to finding the news in the microfilm edition, or in hardcopy issues of the newspaper is \$250 for the 12 monthly issues and the annual cumulation. Prices are slightly higher outside the U.S. and Canada.

Backfiles of *The Washington Post* are available for every year, beginning with 1877. Indexes are available separately for 1979 and subsequent years.

Research Publications also offers many important world newspapers and periodicals in microform, including *The Times* of London, *Financial Times*, *Le Monde*, and *Far Eastern Economic Review*.

To place an order, or for more information, call or write:

12 Lunar Drive/Drawer AB
Woodbridge, CT 06525
(203) 397-2600
TWX: 710-465-6345
FAX: 203-397-3893

rp

research publications

Outside North and
South America:
P.O. Box 45
Reading, RG1 8HF England
TEL: 0734-583247
TELEX: 848336 NADL G

DEWEY Decimal Classification®
Numbers You Can Count On!

New FROM FOREST PRESS

Melvil Dewey: The Man and the Classification. 1983.
Proceedings of 1981 Seminar. 210 pp.
ISBN 0-910608-34-2 \$10.00

CONTENTS IN BRIEF

Keyes D. Metcalf Reminiscences of Melvil Dewey	Wayne A. Wiegand Melvil Dewey and the ALA; 1876-1907
David Kaser The Dewey Era in American Librarianship	John P. Comaromi The Foundations of the DDC
Dee Garrison Dewey the Apostle	W. Boyd Rayward The Early Diffusion Abroad of the DDC
Francis Miksa Melvil Dewey and the Corporate Ideal	Gordon Stevenson The Classified Catalogue

Also Available **DEWEY Decimal Classification and
Relative Index. Edition 19.** 1979. 3385 pp.
Set: 3 Vols. ISBN 0-910608-23-7 \$100.00
Purchasers of Edition 19 are entitled to receive FREE
issues of DC& as released. Vol 4, No. 4 available early
1984.

**Manual on the Use of the DEWEY Decimal
Classification: Edition 19.** 1982. 551 pp.
ISBN 0-910608-32-6 Paper \$20.00

**Abridged DEWEY Decimal Classification and Relative
Index. Edition 11.** 1979. 618 pp.
ISBN 0-910608-22-9 \$27.00

Sistema de Clasificación Decimal. 1980. 2655 pp.
Set: 3 Vols. ISBN 9-910608-26-1 \$75.00

All prices plus postage and handling

Forest Press

85 WATERVLIET AVE. ALBANY, NY 12206 U.S.A. (518) 489-8549

Commonsense Cataloging

A Catalogers' Manual

The Completely Revised Third Edition

A standard cataloging handbook for practicing librarians and library school students since 1965, *Commonsense Cataloging* has just been completely revised to meet the needs of cataloging in the 80s.

The new Third Edition features:

- clear explanations of the major classification systems
- an examination of the consequences of AACR2
- a reorganized cataloging code
- updated information on adopting prepared catalog copy
- details of making catalog entries
- cataloging rules for non-book materials
- an examination of the effects of library automation

Rosalind Miller and Jane Terwillegar, both experienced teachers of cataloging, have followed the approach of earlier editions: clarify basic principles before applying rules to specific instances. Each of the 12 chapters discusses a different aspect of cataloging and concludes with a summary of concepts and terms introduced. A glossary and index are included.

176p. 1983. (ISBN 0-8242-0689-4). \$22, U.S. and Canada; \$25, other countries.

Order directly from:

The H. W. Wilson Company
950 University Avenue
Bronx, New York 10452

Telecommunications Systems and Services Directory

First edition published in three softbound parts. About 700 pages and over 1,500 entries in the three parts. Parts 1 and 2 in print; part 3 ready July. \$150.00 for the three parts. **Available at Gale's 5% standing order discount.**

Edited by John Schmittroth, Jr., and Martin Connors. Includes telecommunications glossary explaining terms, acronyms, standards, government rulings, etc. Four indexes: master index, personnel index, geographic index, and function/service index, all cumulative in Parts 2 and 3.

"Unique and well-organized"

Consult this new directory for detailed descriptions and complete contact information on today's high technology communications systems and services.

Covering the entire gamut of modern voice and data communications, from long-distance telephone services to teleconferencing and electronic mail, entries provide full names, addresses, telephone numbers, and contact persons, plus general descrip-



tions of services, specific application access, geographic areas served, clientele, and more.

Reviewer's comments

"The directory offers users a unique and well-organized reference tool for the vast telecommunications field... When the subsequent issues are available, *TSSD* should become a useful tool for any businessperson, researcher, or student interested in the telecommunications field. *TSSD* is not only recommended for reference collections in public and academic libraries but also as a desk reference for corporate managers in the communications or related industries."—**RQ**, Fall 1983

Also available from Gale...

Encyclopedia of Information Systems and Services. 5th edition. Edited by John Schmittroth, Jr. 1,242 pages. 23 indexes. Published 1982. \$285.00. **(SO)** Provides detailed descriptions of more than 2,500 organizations in the U.S. and other countries that produce and/or provide access to computerized information in all subject areas. A master index cites the over 16,000 organizations, services, and products described.

Online Bibliographic Databases. 3rd edition. Edited by James L. Hall and Marjorie J. Brown. 383 pages. Index. Published by Aslib, 1983. Distributed in the U.S. and Canada exclusively by Gale. \$90.00. **(SO)** Gives essential details on 200 online bibliographic databases accessible through 40 online service suppliers throughout the world.

Online Database Search Services Directory. 1st edition published in two softbound parts. Edited by John Schmittroth, Jr. Part 1 in print; Part 2 ready August. \$75.00 for the two parts. **(SO)** Furnishes details on about 1,200 libraries, information firms, and other organizations that provide

computerized information retrieval and associated services. Specific and separate indexes allow access by organization name, by online systems accessed, by subject, by database searched, by personnel who do searches, and by geographic location.

Abstracting and Indexing Services Directory. 1st edition published in three softbound parts. Edited by John Schmittroth, Jr. Cumulative publications, publishers, and keyword index. Published 1982-83. \$140.00 for the three parts. **(SO)** Lists and describes over 1,500 current and continuing publications, including abstracts, indexes, digests, bibliographies, catalogs, and similar works in all fields. Also covers abstracting and bibliographic compilations that are regular features of standard journals.

(SO) These titles are available at Gale's 5% standing order discount. All Gale books are sent on 60-day approval. Deduct 5% if you send check with order. Customers outside the U.S. and Canada add 10%.

Gale Research Co. • Book Tower • Detroit, MI 48226

To order by phone: 1-800-521-0707 tollfree. In Canada, Michigan, Alaska, and Hawaii: 1-313-961-2242.