THE BOOK CATALOGS OF THE LOS ANGELES COUNTY PUBLIC LIBRARY

John D. Henderson

The decision to issue our catalog in book form was made after a study of mechanization indicated that this format could best meet the needs of the field staff and the public served by the County Library system. It was seen that catalog production by data processing techniques could be achieved for all branches at a low cost per unit in comparison with the expense of maintaining traditional card catalogs at the service outlets. To present the setting in which economy and mechanization proved to be so important, some background information is in order.

The Los Angeles County Public Library serves an area of 3,300 square miles, now populated by two and a quarter million people, predicted to reach four and one half million by 1980. Forty-one cities, from 15,000 to 100,000 population, are included in this service area with a combined population of more than one million. The balance of the residents live in the unincorporated territory. There are ninety-three service outlets grouped in eight regions with a center programmed for each housing 100,000 volumes and accommodating 150 readers. The satellite branches within the regions have collections ranging from 5,000 to 35,000 volumes. These are supplemented by seven bookmobiles. The Library also has sixteen branches in county institutions, such as jails, hospitals, road camps, and other facilities.

The Library serves in round figures 800,000 readers with a book collection of 2,000,000 volumes embracing 200,000 titles; approximately 10,000 titles (7,500 purchased, 2,500 gifts) and 250,000 volumes are added to the collection annually.

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Centralized Administration

From its founding in 1912, the County Library was a highly centralized organization with all professional administrative activities directed from Headquarters. Until just a few years ago, most of the branches were small, with modest book collections. A policy of buying a relatively large number of titles with a small number of copies was established at the outset. The practice was to "exchange" or "revolve" the collections at the branches at intervals of about six months. This practice provided patrons with a large variety of titles, but not necessarily the ones wanted at any given time. A request system was developed by which any book included in the Library's book stock could be obtained by a patron. Folders of book jackets publicizing the new books and published annotated lists of current accessions were distributed to the branches; however, there was a growing awareness on the part of the staff and the administration and the public that something better was needed to inform readers of the Library's resources. Each branch had an official shelflist covering local holdings, but its use was limited to the staff.

In 1951, when our studies of the printed catalog's possibilities began, there were card catalogs in twenty-six branches; a number of these were no longer major outlets because of population shifts; and the lack of catalogs at the remaining branches was a source of frustration to patrons and staff. The only complete record of the entire collection was in the Central Card Catalog which, because of its location, was of value primarily to the headquarters staff. Without references to Central, there was no way of determining what books were in the system beyond the branch collection; and the request service, although an asset, was not the feature that the Library had hoped to make it for the borrower.

Impact of Population—Reorganization

The decisive decade for the County Library began in 1951. Population expansion was then well under way; the accelerated urbanization of the County plus the increasingly sophisticated demands of our readers placed unprecedented pressures for a metropolitan quality service upon a library system that was still basically rural in structure and operation. It was clear that reorganization was called for with the greatest possible expansion in all elements of the program: books, personnel, and buildings. First attention was given to the book collection and the administrative structure of the Library.
Following a study of libraries serving more than one million population, a reorganization along regional lines was instituted by which over-all administration, book buying, cataloging, and processing were continued at Central. Eight geographic regions were established with a ninth for service to institutions. Each region includes a population of almost 300,000 and is directed by a Regional Librarian; in each there are from ten to sixteen community branches. Book evaluation by subject specialists is carried on at Central, with public service and book selection the chief responsibilities of the Regional Librarians. The Regional Librarian is in touch with the title and subject requests filled by the local branches as well as those that are referred to the region and those that the regions must forward to Central.

It was clear that the request system should continue but primarily on a regional basis. The regional headquarters facilities were designed and equipped to serve as the first backstop and resource for the local branches.

The catalog in book form received attention early in our studies of the organization and service. Since we are a young library in the process of maturing and strengthening a book collection to serve a large number of service outlets, it was seen that our need was urgent for a basic, convenient bibliographic tool to be used throughout the system by readers and the staff, at once simple, complete, and (comparatively speaking) economical. These were the features of the book catalog; it provided staff and readers with a full perspective of the book collection and it implemented our philosophy of service. After our adoption of the new format, title requests were filled out accurately and our subject holdings were readily determined. Book retrieval was expedited; with our resources thus arrayed in full scope and depth, a new dimension was added to our service.

Production Program

The accompanying flow chart shows that the production of the catalog was in two phases, preparatory and operational. See Figure 1.

Since the tabulating or punched card is the basic control in data processing and production of the book catalog, our first challenge was to develop a format that would be flexible enough to permit for future refinement and yet conform to the limitations of mechanization. At this point, it should be explained that the punched card in microcosm and in its own language encompasses everything that appears ultimately in the printed catalog. For economy, the same basic design had to be used for all divisions of the catalog. After the design of the
Figure 1
Catalog Production Flow Chart
card was completed, an electroplate of the layout was cut for the printing in quantity of the initial and subsequent card stock.

Preparatory to the first phase, it was necessary to revise the Central Card Catalog; this involved weeding obsolete entries, correlating subject headings, revising see references, and clearing a multitude of details in the 432,000 cards comprising our basic bibliographical tool.

Decisions then had to be made concerning the amount of bibliographical detail to include in the new format since the catalog was being designed to serve readers and staff at the branches. Simplicity was our aim. Following a survey of branch personnel and patrons, items determined to be essential were classification number, author (full name and all cross references), full title, edition (other than first), date of publication, volumes (when more than one), and a brief annotation to be prepared by a subject specialist. It was decided to issue the adult and juvenile catalogs in four major divisions each: (1) Author, (2) Title, (3) Subject, and (4) Subject-Fiction, with a separate volume for foreign publications. Cumulative supplements were scheduled at regular intervals.

From Catalog Cards to Tabulating Cards

To convert to the book format and to mass produce the catalog, the following procedures, techniques, and equipment were employed. Central's revised catalog cards, subject headings, and see references were punched into standard key punch tabulating cards which were merged into proper sequence through automatic sorting and manual filing. The various card decks for the appropriate divisions of the catalog—author, title, subject—were then processed through an IBM #407 printer-tabulator which "read" the cards and converted the information into printed text on a continuous form multilith master. After final proofreading, page masters were run on #1250 multilith presses to produce the printed pages, which were then bound into volumes.

Later editions and the cumulative catalog supplements were produced by the same method. Maintenance of the card decks involved filing of the appropriately punched tabulating cards representing added titles and the pulling of cards when titles were withdrawn from the collection. Each edition of the catalog was built upon the preceding edition with certain refinements and minor changes being made as necessary.

The author division was an alphabetic listing including the essential bibliographic data noted above. The title division was
briefer—a straight alphabetic listing by title with only author and class number for non-fiction. More sophisticated was the subject division; it included the subject specialists' annotations, see and see also references, and analytics for series and anthologies.

Each card contains ten rows of eighty printed numbers, plus space for two more rows. Information is placed on the card by punching out the appropriate numbers. Two punches in a column are required to designate each letter and one for each digit. Each card, when fed into the IBM #407 tabulator, produces one line of text. The punched card is "read" by electronic devices as it passes over wire brush "fingers," which activate a printer mechanism. Figure 1 shows the steps followed in converting catalog cards to punched cards.

The steps involved are:

1. From the Central Subject Authority File are punched:
   Subject master cards
   See reference cards
   See also cards
2. Subject codes are calculated and punched into cards.
3. All cards are reproduced; one set is used in Step 8, the other set is used to prepare the Subject Master Code Book.
4. Subject cards are processed by the 407 printer-tabulator to prepare Subject Master Code Book.
5. Information is retrieved from the card catalog to prepare control cards manually.
6. From data on the control cards are punched author, author reference cards, annotations, title, and title reference cards.
7. Information cards from Step 6 are reproduced on the #514 duplicator up to Subject Code Field to produce detail cards for each subject required for the Subject Division of the Catalog.
8. Collator merges the subject detail cards from Step 7 behind the subject heading cards (from Step 3) into the following sequence:
   Subject heading
   Author-title entry
   Annotation
   See reference
   See also reference
9. All cards from Step 8 are processed by the 407 to produce multilith masters of the text of the Subject Division of the Catalog.
10. Added author reference cards are interfiled into the author card file.
11. All cards from Step 10 are processed by the 407 to produce multilith masters of the text of the Author Division of the Catalog.

12. Title cards are placed in alphabetical order by sorter.

13. All cards from Step 12 are processed by the 407 to produce multilith masters of the text of the Title Division of the Catalog.

Basic Design of Tabulating Card

As used by the Library in production of the author and subject divisions of the Catalog, the card is divided into six fields, with the first field of fifty-four numbers (or columns) being used to punch the author’s name (last name first), followed by the title of the book, edition, copyright date, and any necessary volume information. The second field, consisting of eleven columns, is for the classification number or to indicate “periodical” or “document.” The third field consists of six columns and was originally “free.” It later was used to indicate the year of purchase. The subject code number appears in the fourth field consisting of seven columns. The fifth and sixth fields, consisting of columns seventy-nine and eighty are used for the card sequence number.

Except for classification number, all catalog text is reproduced from data punched in the first field of fifty-four spaces. If this field does not accommodate the required information, a second or “overflow” card, and if necessary more, continues the entry.

In the subject division of the Catalog, indentation of printed text is governed by placement of the initial letter (or punches) on the cards. Subject headings begin with the twelfth space, annotations start on the ninth, and “See” and “See also” references commence with the fifteenth space. It should be noted, however, that in each instance title-author and author-title entries are preceded in the text by classification number. Sequence of the text is determined by the wiring of the control board, which is discussed later. This in effect moves the text fourteen spaces to the right. See Figure 4.

Subject Heading Code Numbers

In Figure 4 it will be seen that each card has a seven-digit code number 8118240, columns seventy-two through seventy-eight, and the same number will be seen in Figures 2 and 3. This is the identifying
Figure 2
Subject Heading Card

Figure 3
Subject Detail Card
Figure 4
Example of Entry in Subject Division of Catalog,
Showing Subject Heading, Author-Title Entry, and Annotation

code number assigned to the subject "Alan Bartlett Shepard." Each of the subject headings included in the subject division of the catalog, whether for fiction or non-fiction, is assigned a specific subject code number.

Subject heading code numbers were necessary because of the complexity and bulk of the material to go into the subject division of the Catalog. There were 71,650 initial subject headings; these have increased to 86,333.

Phase I - Subject Heading Master Code Book

The first step in the preparatory phase of catalog production via data processing techniques was the keypunching of subject headings on tabulating cards (See step 1 of Figure 1). Preceding this, however, all entries in the Central Subject Authority File were verified against the Central Card Catalog to ascertain that the headings were up to date and in suitable form. An X punch was made in column seventy of the first card of each "see" reference to allow for the counting of headings and to control the spacing before and after each heading as they are used in the final preparation of the subject catalog.
The second step (see Figure 1) was the processing of the tabulating cards containing the subject headings by an electronic calculator which assigned a seven digit code number to each subject heading (in alphabetical order), and punched this number into the tabulating card. Provision was made for future expansion of subject headings by spacing 240 number units between the assigned code numbers.

The third step was the automatic duplication of the entire deck of calculator processed subject heading cards. This operation was performed by an IBM #514 duplicator. After this process, the Library had two complete sets of subject heading cards in alphabetical order, with a permanent number assigned to each subject heading. Additional subject headings could be added later, still in alphabetical order, within the 240 unit gap between code numbers.

One deck of the cards was reserved for the direct production later of the subject catalog. The other deck of subject heading master cards was (in step 4 of Figure 1) processed through an IBM #407 tabulator which printed the text (code number and subject heading) on continuous form paper. The printed sheets were separated into pages, numbered and bound into six volumes to provide a master subject heading Code Book to complete the preparatory phase of catalog production. As required, additional subject headings are written into the Code Book in alphabetical order.

Phase II - Control Cards

The manual typing of “control cards” (Figure 5) was the initial step in the operational phase (Step 5 of Figure 1). One control card was prepared for each title, or about 120,000 in setting up the operations and 80,000 additional cards were taken from the Central Card Catalog and the master subject heading Code Book. In the upper left-hand corner appeared the classification number, then the author’s surname, full forenames, title of the book, edition, the publisher’s name in abbreviated form, and the copyright date, followed by any necessary volume information. The annotation on the card was given in note position, with the subject tracings below and preceded by the subject code numbers. Tracings for added entries, joint authors, and partial titles followed. Cards were kept in alphabetical order.

Subject detail cards were then keypunched from the control cards; they included the author-title entry, plus the annotations. (See Step 6 of Figure 1). One complete set of the cards was punched for each subject heading, thus bringing together all titles under a given subject. In punching a group of cards for a set, the first eight columns were always duplicated on the second and succeeding “overflow” cards.
329.45 Caidin, Martin
Man into space. Drawings by Fred L. Wolff.
192 p. illus., ports. 18 cm. (Pyramid books, PR35)
"Glossary of space terms": p. 189-192.

1. Project Mercury. 2. Shepard, Alan Bartlett
I. Title.

Figure 5
Catalog Card

An on-the-spot report from Cape Canaveral on
Commander Shepard's historic rocket ride, as
well as the events that made it possible.
Photographs.

7294780 1. Project Mercury
8118240 2. Shepard, Alan Bartlett
8352940 3. Space flight

1-8, C

Control Card
for the author-title, annotation, and title-author entries to identify and keep the sets together. Punching of the tabulating cards was identical for each set of cards, except for the code number. Repetitive data was reproduced automatically on the key punch machine. In the second and succeeding sets of cards an X was overpunched in column seventy-two to identify cards destined subsequently to be merged (by the collator) into the subject detail files. (See Step 8 of Figure 1.)

After the subject detail cards were completed, the entire group was run through an IBM #514 duplicator and one set of green striped cards was automatically duplicated from the first set (which had no X punch in column seventy-two) to produce the file of author entries for the author division of the catalog (Step 7 of Figure 1).

Subject detail cards (consisting of all entries under each subject heading, including author-title entries and annotations) were sorted numerically by subject code and merged by an IBM collator behind the proper subject heading cards. The collator is designed to interfile two groups of cards, each of which is arranged in correct sequence. This operation was referred to (Step 8 of Figure 1) as "merging" and resulted in the subject detail cards being placed in proper relation to the subject heading cards; these are controlled by the subject heading code numbers. After merging, the tabulator cards were ready for final processing to produce the subject division of the catalog (Figure 4).

The complete deck of cards for the subject catalog was then processed through the IBM 407 tabulator which printed the proof copy on continuous-form short run multilith masters. The page masters were then run on two #1250 multilith presses to produce the text for the subject division of the catalog (Step 9 of Figure 1).

The author cards which had been punched (Step 6 of Figure 1) along with the subject heading cards were in alphabetical order (Step 10). Added entries and author reference cards were hand-sorted and interfiled into proper sequence. The author card deck was then processed through the 407 to produce the text of the author division of the catalog (Step 11 of Figure 1). See Figure 6.

Title Cards Punched Separately

Although the basic design of the tabulator punch cards used for the title division of the catalog was the same as for other entry cards, the punching fields differed because of the order of the entries and it was necessary for these cards to be punched separately. The first field of fifty-four columns is for the title, followed by the word "by" and the initials and the last name of the author. The second field of
Figure 6
Catalog Author Entry: Line of Text
as Produced by the Author Entry Tabulating Card

Figure 7
Catalog Title Entry: Line of Text
as Produced by the Title Entry Tabulating Card
eleven columns is for the classification number; the third field of thirteen columns consists of the duplication of the ninth through the twenty-first letter of the title, upon which the alphabetical sort of the IBM sorter machine was used. The fourth field, consisting of columns seventy-nine and eighty is used for sequence numbers. The title cards were punched during Step 6 but set aside temporarily. When ready for processing, punched title entry cards were placed in alphabetical order by the IBM sorter with some final filing done manually (Step 12 of Figure 1). The final step in the automated production of the catalog was the processing of the title entry cards by the 407 tabulator. See Figure 7.

Control Panel Directs #407

The "brain" of the IBM #407 is its control panel. A single panel, measuring about twenty by twenty-two inches, was utilized for the production of all divisions of the catalog, and with use of selector switches produced the master subject code books, proofs, and the final multilith master stencils. The 407 is a tabulator adapted to printing, with the tabulator cards activating printing wheels to produce text at the rate of 150 lines per minute.

The panel is wired through selector switches to allow for the proof-run showing the code number, the X-punches, and the acquisition and sequence numbers, since data punched in different fields on the cards may be shown by the class selectors in one run or be omitted in another, or be moved automatically to various positions on the printed form. An example of this is the classification number, which is punched in columns fifty-five through sixty-five and, by the use of selector switches, appears on the left side of all printed forms. The panel is also wired through switches to print six lines of text per inch in the Children's Catalog, for easier reading by youngsters, and eight lines of text per inch in the Adult Catalog. The double spacing allowed before and after the subject headings in the catalogs is controlled by wiring in the panel through which electrical impulses are sensed by the X-punch in column seventy of the subject heading card. The word "continued" is wired into the control panel to show on the multilith master if a break is necessary at the end of a page in a "see also" reference.

When subject entries carry over from one page to the next, the subject heading is printed at the top of the second and succeeding pages by "overflow skipping." When one master is filled to the determined length and the next master advances, the subject heading in use is printed at the top of the continued listing. This overflow skipping is caused by sensing a punch in a specific position of the tape.
Continuous-form paper for proofreading and continuous form masters for the multilithing of pages are used on the IBM 407. The continuous forms carry marginal punches at half-inch intervals on each side. Pin-feed devices geared to the machine platen carry the forms into position to receive the printing.

The first or preparatory phase of catalog production was completed with the issuance of the first full edition of the Catalog in 1954. Since that time, all processes have been included within the steps indicated in the operational phase on the flow chart—i.e., continuing maintenance following the original edition. This has consisted of adding title, author, and subject entries to the appropriate division of the Catalog, and the elimination of data concerning titles that have been withdrawn from the book collection, and the up-dating of continuations. Except for the automatic duplication of tabulating cards by the key punch machine and the reruns of the card decks for supplements and new editions on the 407, the maintenance operations have been performed manually.

The Catalog has been kept up to date through the publication of monthly cumulative supplements which are incorporated into the bound volumes on an 18-month cycle.

### TABLE 1
STATISTICAL DATA ON THE PRINTED CATALOG

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Entries</td>
<td>Bound Volumes</td>
</tr>
<tr>
<td>ADULT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>86,000(est.)</td>
<td>5</td>
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<tr>
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<td></td>
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</tr>
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</tr>
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</tr>
<tr>
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<td>26</td>
</tr>
</tbody>
</table>

REFERENCES

Discussion

Bruce Stallard*

A catalog in book form seems well adapted to a county library where, as in the case of the Los Angeles County Public Library, a large number of branch libraries with book collections differing in size are dispersed over a broad region. Here the total resources of the Library would not be immediately available at any one outlet. Mr. Henderson has indicated that a book catalog containing the total collection available within the region was decided upon as a desired means of providing a more complete service.

One cannot inspect the Los Angeles County Book Catalog and not become aware of the effort that was made to meet the needs of all potential users. It is complete in all types of references, analytics, series, and other entries. Annotations, often several lines in length, are a special feature of the volumes making up the subject catalog. Subject headings have been adapted to machine processing and appear in straight alphabetic order more frequently than is found in the usual card catalog where chronology and other factors often break up alphabetical arrangement. For example, "BIBLE. N.T." appears ahead of "BIBLE. O.T." Users not versed in filing rules for the dictionary catalog no doubt appreciate this arrangement.

Mr. Henderson has outlined in detail how the tabulating card was divided into fields of a determined number of columns. He has described how each field was set aside for a specific purpose and has

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explained that certain columns were punched for control purposes in machine processing.

Techniques of card design allow permissible variation in the choice of location for punched data, providing the same type of data is always placed in the same location on the card. At another time, different columns (or fields) might have been used to achieve like results.

The success and useful length of life of any data processing application depends upon how carefully it is planned before it goes into operation. When used as a basis for the preparation of a punched-card catalog, the conventional card catalog should be revised if it is not in good order. It is especially important to make any necessary corrections and alterations in subject headings before they are assigned code numbers for machine processing.

The type of entries to be used in the book catalog must be decided upon and the maximum length of each part of the entry must be determined before the number of columns for a given field can be assigned. Standard arrangement of data on the card is required for machine processing. The punching of specific data is restricted to the number of columns that were set aside during initial planning. Once fields of fixed length have been punched, a change to accommodate a longer entry cannot be made without making over all cards that have been punched. It is cheaper to first spend enough time to resolve all present and future problems that may be encountered or anticipated than to find that the job must be done over again at a later date at even greater expense. For example, the number of digits to be used for the coding of subject headings should allow for future expansion. Los Angeles County chose a seven digit code which allowed a predetermined 240 units between headings. This provided for the future addition of 240 new subject headings between each of the headings being used at the time the catalog was planned. When initial planning was started about ten years ago, Los Angeles County had a book collection of about 800,000 volumes. Since that time the Library has grown to 2,000,000 volumes. Fortunately, the 240 units of expansion originally provided in the seven digit code has permitted this amount of growth.

With an estimated ten punched cards per title, the Library, now with over 200,000 titles, would have some 2,000,000 punched cards in its files. Cards for titles newly purchased are kept in separate files for the printing of cumulative supplements. They are manually merged into the main decks when a new edition of the complete catalog is due.

“Large scale file processing” would perhaps be a better term than data processing for the printing of this large catalog. With a rated speed of 150 lines per minute, the IBM 407 would need a mini-
imum of six weeks or more to handle approximately 2,000,000 cards for a single printing on multilith masters. With two machines at work, running time would be reduced but it would still remain a massive printing job for this type of equipment. The accounting machine was designed for various business applications and not primarily for speed of printing. It has the capability of accumulating and printing totals and possesses other features that are not necessary in the printing of a book catalog. A higher rate of speed would be desirable in a printing job of this size.

The job is not finished when it leaves the accounting machine. Additional time is needed to produce by multilith the number of extra copies required for distribution. Multiple copies for each page of the catalog must be collated and bound into the appropriate volumes making up the complete set: The complete set of fifty-seven volumes would contain thousands of pages and would take time to assemble. The 1958-59 cost of producing one full set of the volumes has been placed at $690.90.2 This was considered more economical than maintaining card catalogs in each of the many branch libraries. From the standpoint of both economy and service, it would seem that the book catalog is well established at Los Angeles County.

In the business world, the usual step from unit record equipment is to a computer. Even a computer with a peak printing speed of 600 lines per minute would require roughly one and one-half to two weeks to prepare multilith masters for the Los Angeles County catalog. An advantage claimed for the computer is that when data are stored on magnetic tape, large files of punched cards are no longer necessary to maintain, thus creating a saving in this part of the operation.

A number of libraries now have book catalogs produced from punched cards but none has reported a comparable experience with magnetic tape. Results of projects now underway at the Illinois State Library3 and the Undergraduate Library of the University of Illinois in Chicago4 will be of interest when results are reported.

The rapid growth in computer installations is evident in the prediction that there will be 20,000 computers in operation in the nation by the end of 1963.5 However, computers, as we know them today, are expensive pieces of equipment and rental rates at service bureaus are correspondingly high. Reels of tape are fairly inexpensive but the tape handling units used with today's computers are quite expensive and figure prominently in over-all cost. The cost of four tape units amounts to approximately one half the total cost of one of the more common medium-scale computer installations. Random access of high capacity is also expensive. There is a need for a more economical means of storage and input if many libraries are to find a place in their budgets for full use of a computer. As in the case of
the accounting machine, computers are designed for other capabilities as well as for printing. For a printing job the size of the Los Angeles County Book Catalog, the printing speed of the lower priced medium-scale computer could stand improvement.

As greater numbers of computers are placed in service, more used equipment will become available. It may also follow that marketing competition will bring improvements and reduced costs. Of even greater importance is the scientific revolution which is growing increasingly evident as time goes on. Technological achievements that may come in the next few years are difficult to predict, but the rapidity of new developments may very well exceed present expectations. The field of data processing may be due for some important developments in the not too distant future with more economical and widespread use as a result.

Those who contemplate the preparation of a book catalog at this time might be ill advised to make too many compromises for the sake of immediate economy. Librarians today need to alert themselves and be ready to take advantage of new developments as they become available.

REFERENCES


2. Ibid., p. 225.

