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Abstracts

397
405
417
422
431
437
443
446
446
448
448
449
450
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Too many automated library systems are focused toward a mechanized, batch-processing, card-oriented system. The technical processing areas of a large library (over 500,000 titles) are mainly business functions applicable to a Central Dynamic Store (Data Bank) concept. The implementation of such a concept utilizing an on-line computer system is discussed with emphasis on the acquisition, serials, cataloging, and circulation functions of a library.

Too much has been said about the increasing production of printed material in the world and the problems this mass of material will cause in our present libraries. Mechanization is thought to be the answer to this complex problem, but the inherent problems of mechanization have only added to the already existing complexities of the library environment.

This paper assumes that library automation is needed and discusses a new approach in library automation as distinguished from library mechanization. Complexities of the library environment. Library automation is the implementation of library procedures on a computer as opposed to punched-card equipment or mechanization. The approach taken in this paper is not new from a systems standpoint, but it is new in its application to a library environment. Specifically, the type of library referred to here is a university library. This does not mean that the methods discussed are not applicable to other types of libraries.

The techniques of Business Information Systems utilizing a "Data Bank" store are used to eliminate the single-function machine concepts of the punch-card systems. The library as a business environment is complemented by a Central Dynamic Store (CDS) which houses selected files and which supports the simple procedures of the library and does not pretend to deal with all of the exceptions of the library process.

The Business Function

The library as a business has always existed, but the library profession has not satisfactorily approached it from this perspective. The librarian can be viewed as a businessman with an information service as the product he is furnishing. Within the library, there are common business functions such as purchasing, marketing, bookkeeping, and shipping-receiving. These functions indicate a strong business attitude, and they should be treated as such for systems design simplicity.

If these business functions are defined, an approach for automating a business service environment can be taken. An initial step for definition is
the analysis of the existing practices for more centralized procedures within the business or the library. The library, like many businesses, exists for the buyer or user; therefore, its foundation must be centralized for strength and yet fluid for diversity in order to meet the demands on it.

The traditionalists have offered a solution to early business systems. This was the punched card. Without this initial media, large business systems would not have progressed to the more sophisticated on-line, time-sharing computer systems of today and tomorrow. The punched card systems, however, are becoming dated, and more effective systems are now being implemented. From the experience learned through early systems, why should libraries adopt dated card-systems for libraries? Before discussing the CDS approach for libraries, some points should be clarified about the card-system in the library environment.

**The Card-System Library**

A majority of the library automation projects (these are mechanization projects) revolve around the unit key-punched card. This approach to library automation is static. Card systems are not flexible for the selection and/or changing of specific information. Although card information is machine-readable, the validity of the information is questionable because of the difficult verification procedures employed. These and other qualities made card-systems unsuitable for modern libraries as well as non-compatible with any other library environment than the one for which they were designed.

The mechanization of library procedures utilizing the card-system is normally implemented to a specific area of library processing (i.e., circulation, ordering, and/or serials). Consequently, other areas of the libraries have suffered from the inherent problems of this mechanization. Considerations of the environmental controls and influences of the other areas within the library have not been recognized or have just been ignored. The area that is mechanized does not necessarily improve the total service or total organizational process of the library. It may, in fact, complicate or add needless problems to the library's other processing functions.

The product of a card-system is a list. The list may reflect a status of material (i.e., on-order, charged circulation, or received) or financial statements for accounts. The list produced from cards is only an indication of status at the time the cards are processed, and does not reflect current or now status. The value of lists in a dynamic business environment is normally low. For purposes of control on a physical inventory as well as the normal processes of ordering, receiving, etc., a card system is not the answer.

The manual manipulation and storage of cards has always represented a problem. The card, like a slip of paper, is a physical piece of information. It must be maintained, routed, and stored. The problems relating to a box or tray of cards being dropped or mutilated do not have to be enumerated.

Cards can only be used as a tool to generate lists. Their use for conveyance of information to nonlibrary personnel or outside users is null. They are interpreted only on an internal library or processing nature. Because it is felt that library holdings must be accessible to

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outside users, information networks have been planned. If this is to be a reality in the next few years, card systems will be incompatible in support of any information network of remote on-line nature. Current-status systems with accessible information to a remote user will be used in an information network. To ready a library for the eventuality of massive flows of information with accessible service to any user, the approach of establishing a Central Dy namic Store to support information networks must be planned. For the library card-systems in existence today, this means a repetition of initial analysis and planning to meet any on-line objective.

THE CENTRAL DYNAMIC STORE IN THE LIBRARY ENVIRONMENT

The CDS in a business as well as library environment is a working tool for the internal and external organization. It is a flexible and dynamic medium which is as fluid as the environment demands in which it is established. The characteristics of the CDS are expandability, contractibility, compatibility, and accessibility. With these characteristics, there is no question of its suitability in a library environment.

Physically, the CDS is a large-hardware, random-access memory device. This memory is a storehouse of any information desired to maintain the objectives for survival of the organization. The library business is maintained from a series of files of information that reflect the various functions or transactions of a current and historical nature. This means the CDS system can yield in-process, to be ordered, current holdings, and historical status information for forecasting and maintaining current ordering, processing, and receiving functions.

The CDS is accessible from any communication-linked physical location in or out of the library facility. This is accomplished through a remote terminal device, preferably a cathode ray display device. Any individual employed by the library can perform the various functions of the library process on the CDS without disturbing anyone else using the CDS (i.e., immediate access or no waiting). This is accomplished by operating the CDS on a time-sharing computer system.

Changes to any file or record within a file can be made at any time to reflect new information or updated information for any process within the library.

In a particular library environment, the CDS contains the major files of the library. The files or information from the files is accessed within a real-time or query-response mode. The response to a query is fast enough not to jeopardize any immediate need for the response. The information gathered from the files depends upon the design of the files and the retrieval structures designed for the programming system.

To assist in the bibliographic verification of incoming orders, searching an in-process or outstanding order file along with the shelflist initially eliminates any duplicate ordering. (This was found to represent an average of 30 to 40 percent of the incoming orders at Oregon State University.)

The ordering process is easily handled by the CDS through the introduction of the verified author-title and associated information to combine with a vendor file for the printing of the purchase order from a CDS order file on a continuous-printed form order. The printing of orders is done either through a re-

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quest to the system for immediate print, in the case of rush or direct orders, or batched ordering by vendor, on a daily or weekly basis. Once the order information is printed for mailing the original order information is transferred internally to an outstanding order file existing in the CDS. Because a historical-financial file is maintained by the CDS for serial-ordering reference, the order process incorporates serials ordering as well.

Serials processing has always been a problem in libraries because of their inconsistencies compared with monographs. Title changes, irregular publication, and noncommunication between publishers and receiving agencies can be assumed always to exist. The CDS system with its flexibility in design handles the majority of serial processing.

The check-in process of serials with the CDS system is an update function. The date of issues received is recorded after searching the serials holding record for the particular issue received. The binding and claiming functions of a serial or cataloging area are by-products of the CDS system. Internal programs hold in check all serial records to conform to predetermined algorithms. These allow the CDS system to inform technical processing personnel that a claim should be issued for a serial or that a serial is ready for binding.

Cataloging processes are a function of the CDS ordering process. If LC cataloging is available from bibliographic verification, a catalog flag is noted when the title has been placed on-order. Upon receipt of the material ordered, the system transfers all information for the shelflist record to the internal shelflist file. If a physical card catalog or book catalog is being maintained, generation of the appropriate entry is made or stored. If, during bibliographic verification LC cataloging is not available, updating of the shelflist, etc., is held for receipt and subsequent cataloging of the document and the files are appropriately updated at that time.

The circulation function of the library business is accomplished without the standard unit card approach. The shelflist, merged with a student personnel file, produces a complete charge record for the material. If the library CDS system is used on a total university computer system, the student personnel records may be part of the registrar's system. Maintaining these records would not be a function of the library. Overdue notices are generated from algorithms based on prearranged or standardized checkout periods for faculty, civilians, and graduate and undergraduate students.

Another by-product of the CDS system is one of current operational statistics of the library. This by-product of the CDS is rare in today's libraries. In a manual environment, statistics are hard to retrieve because of the labor and time necessary for normal work loads. When collected, these statistics are of a historical nature and are not a current reflection. The current statistics are generated by the CDS system in patterns which are used to forecast budgets, physical storage capacities, and additional needs for a growing library.

Figure 1 illustrates a generalized approach of the CDS system for some of the processing and information needs of a library. With a little reflection, many more can be seen from the CDS concept.

CDS System—Programming Techniques

The CDS system is supported by a complex system of programming subsystems that is an integration of fact retrieval and storage-retrieval techniques.

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To initiate an operational programming system or total operating system, a series of subprograms are employed to follow a modular programming technique. Modular structuring of programming procedures and/or instructions divides the total program into its logical parts. A logical part is a group of algorithms or instructions that performs one or more functions on the data or program input. The logical part is independent of the total program operation on the data. These logical parts that together compose a total program are called modules. If for some reason a module or logical part is revised or eliminated, other modules of the total program should not be affected.

In a dynamic environment, the CDS system must adapt to changing environment. For example, a programming system may normally experience changes because of experimentation, policy changes, or new design strategies. To meet this changing environment, the system designers must create programs that can be quickly understood and easily modified to reflect changing conditions and whose effect on related programs is understood.

Certain approaches make understanding somewhat easier:

Modular flowcharting. This gives a picture of the programming logic for each module. The module flow charts are tied together to present the total program’s logic flow chart.

Program standardization. Standardization of module symbolism, labeling, and descriptive documentation gives a total program an easier means of understanding.

Detailed documentation. A step-by-step description of the modular routines and their logic is necessary for quick understanding.
Because each modular routine is a separate entity, it is independent of the total program when writing, coding, and de-bugging. If modular or logical routines are intertwined as in batch-process programming, it is very difficult to modify a portion of the program without affecting the whole program. Anyone who has ever tried to modify a program written by someone else knows the difficulties of dissecting and patching another person's programming logic.

Modular programming incorporates the following methods or techniques:

**Total (Main) Program.** The main program executes a complete number of operations that constitute a task on input data. The main program may be an executive control program or an application program. It must make decisions governing the flow of all data to the modular routines it requires.

**Multiple-Use Routines.** If the same sequence of instructions is used two or more times by the main program, these instructions constitute a modular routine. The modular routine after execution of its instructions must return control to the main program.

**Modular Routine Processing.** A modular routine should not be dependent on any decisions made outside the routine, nor should any decisions made inside the routine determine processing outside the routine. The modular routine is responsible for all "housekeeping" for its own existence.

The construction of a modular main program in the CDS system uses an "overlay" technique and provides an efficient way for programming computer core memory programs. It conserves memory by the use of a physical part of memory for more than one modular routine. Sippl defines "overlay" as:

The technique of repeatedly using the same blocks of internal storage during different stages of a program. . . . The use of one area in storage (core memory) to successively store more than one different subroutine or program parts.4

The main program calls the modular routine. After the modular routine has completed its sequence of instructions, control is returned to the main program to call the next module, etc. A mathematical description below shows this concept.

A main program resides during execution in core or main memory of a computer. The main program, $P$, is composed of a series of call statements,

$$\ldots \ C_{p_n} \ldots$$

A list or library of modular routines,

$$\ldots \ M_{m_0} \ldots$$

is stored on some auxiliary memory such as magnetic tape, disk file, or in secondary core storage. Each of the modular routines has a return statement,

$$R_q,$$

where

$$q = n - 1.$$ 

During main program execution, each call statement solicits from auxiliary memory the desired modular routine. After system execution of the routine, program execution control is returned to the main program, $P$, for the next call statement in sequence (i.e.,

$$C_M \rightarrow M_3 \rightarrow C_M \ldots$$

Thus, a general equation for the total programming system (or main program) is

$$P = C_{p_n}(L).$$

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Given: A main program, \( P \)
A series of modular routines, \( M_1, M_2 \ldots M_m \)
A call statement, \( C_v \)
A return statement, \( R_q \)

The structural configuration follows:

<table>
<thead>
<tr>
<th>Core Memory</th>
<th>Auxiliary Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_{p1} M_m )</td>
<td>( M_1 )</td>
</tr>
<tr>
<td>( C_{p2} M_m )</td>
<td>( M_2 )</td>
</tr>
<tr>
<td>( C_{p3} M_m )</td>
<td>( M_3 )</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>( C_{pn} M_m )</td>
<td>( M_m )</td>
</tr>
</tbody>
</table>

Where generally,

\[ P = (C_{p1} M_m, C_{p2} M_m \ldots C_{pn} M_m), \]

\[ m \leq n \geq m; n,m \neq 0 \]

and a list, \( L \), of modular routines,

\[ L = (M_1 R_2, M_2 R_3 \ldots M_m R_q) \]

Thus,

\[ P = C_{pn} (L) \]

It has been found that programs written employing the modular programming technique are efficient both from the standpoint of core memory utilization and of program execution times. With the complexity of on-line real-time systems programming, the modular concept furnishes comprehensive and detailed documentation that may be understood by programmers at all levels of proficiency.

The CDS system is a new concept, and it is of an experimental nature today. Consequently, change and modification are characteristic. The modular technique in programming structures meets the changing design and is necessary for the CDS system where programming logic becomes complex.

**FILE ORGANIZATION**

The file structures of the CDS must be planned to allow a maximum of retrieval flexibility. This can be accomplished economically by fixed field formats. This strategy allows any piece of information within any file or record to be addressed for retrieval by the programming system. The retrieved parameter can be displayed either for referral type of information or updating operations.

The fixed field format of a title record allows future expansion of the system for selective dissemination of information (SDI) purposes. This type of system function is an alarm system to announce to personnel receipt of material that they may have interest in reading. A university research environment has a high usage potential for this type of by-product from the CDS system.

For standardization, the author-title record formats for the CDS or any library system should be built around the MARC (Library of Congress) format. If file structures conform to the MARC formats, compatibility with the new-title magnetic tapes from the Library of Congress will exist.

The files in the CDS environment are accessed by main entry, LC cataloging entry, or any other parameter of information that is used for a look-up key. These parameters can be combined in a Boolean logical search request.\(^5\) Dynamic file structuring maintains a linking organization of files that allows retrieval of series of titles, volumes, etc.

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Hardware Considerations

To support CDS approach, an on-line, time-sharing computer configuration is needed. This is understandably a cost that would stop most libraries from implementation of this type of system. But the concept of time-sharing lends itself toward a community or cooperative ownership among a group of libraries. The shared concept helps to dissolve the total costs in maintaining a computer facility by a single library. If the library is in a university environment, the Computer Service Center of the university may be already operating a time-sharing system. The computer does not necessarily require a large core memory to support the CDS system because most operations are input and output (I/O) file processing and large computation programs are not involved.

The storage unit for this system is of primary concern. Random access storage is costly today for the capacity to hold a total file system or CDS approach for a large library environment (500,000 titles). The IBM data cell is the only mass storage equipment on the market today that approaches a reasonable storage-cost-bit. For example, the CDS system for a library of approximately 500,000 titles must employ at least one data cell of maximum capacity or approximately $35,000 per year for storage costs.

Remote consoles in the form of both teletypes and cathode ray displays are needed to support the remote on-line inquiry and output printing-processes of the system. The number of terminals is a function of the system’s environment.

It should be mentioned that in designing a system as discussed here, hardware backup should be considered. The critical importance of the service rendered by a library utilizing the CDS system approach must be protected with backup systems. If the main system were to fail, backup storage and master files should be maintained for recovery from a failure. Backup hardware in the form of magnetic tapes is one solution. Other solutions can be employed depending on the critical importance of the functioning environment and monies available.

Conclusions

Improving manual procedures (in formulating the manual processes) with the thought of eventual automation must be of initial concern. The computer and the CDS system is the means of assisting in library procedures of a clerical nature. By no means does this paper and its concepts offer a cure-all to all complexities of a library business. But, if properly implemented, the system frees librarians from routine tasks in order to concentrate more fully on “snags” or the decision-making processes for which they are trained.

The costs are never reduced through library mechanization or automation. A leveling of costs may be felt if an automation system is allowed to run for about five years. After this, costs could settle to a palatable level. Expanded user service is a normal rationalization for high costs. Until deeper subject categorizing is employed this service can be practical only in a small specialized subject area or from the broad LC subject categories. Lately the expanded user service hypothesis has resulted in the olde practice of book catalog issue.

The notions discussed in this paper are not impractical from a standpoint of technology. Future automation projects, if they are to be meaningful and practical, will or should utilize the CDS concept. With these considerations, the compatibility with any future information network hookup on a state or nationwide level can be met.
Description of Manuscript Collections: A Single Network System

This system uses the Inventory/Guide and Cumulative Indexes for names, subjects, and chronology. Name control normally is keyed to the file folder level, while subject and chronological control are keyed to the level of the manuscript group. The system capitalizes on the methodology of researchers, who normally will have associated names with special and personalized aspects of their subject prior to their using manuscript and archival materials. Name control becomes the key to specialized subject control. Narrative description is kept to a minimum, and is concentrated in the guide section of the I/G.

The system of description that is outlined in this article is based on the following elements:

1. that the record items comprising manuscript groups have serial characteristics, and that this feature should be the basis of both their arrangement and description;
2. that users of manuscript collections normally approach their subject by having previously associated it with names: personal, corporate, and geographical;
3. that this name/subject association on the part of the researcher is so specific and special as to justify a minimal effort at subject analysis on the part of the describer;
4. that comprehensive bibliographical control of the manuscript collection as a whole is preferable to a minute bibliographical control of single manuscript items, or of only a fraction of the manuscript groups that comprise the manuscript collection;
5. that narrative or synoptic description of items is of little value to most researchers, particularly if such description is at the expense of useful comprehensive description for other manuscript groups in the collection;
6. that individual Inventory/Guides or Registers which are cumulatively indexed for names, subjects, and chronology should constitute the finding aid network for the entire manuscript collection, a single descriptive system.

Before proceeding to an outline of this single finding aid network, some reference to arrangement of manuscript groups is essential. First, in conformity to the principle of provenance, manuscripts are kept together according to the source that generated them. In addition, the existing order of any fresh

Mr. Berner is Archivist and Mrs. Bettis is Curator of Manuscripts at the University of Washington Libraries.
acquisition may already have some ordered arrangement, or it may not. If it does have one, it will be inevitably in serial form. If it does not have one, it should be arranged serially because the activity reflected in the manuscript documentation itself will have occurred serially, not randomly; and both description and retrieval will be made easier. Furthermore, even if items are not placed in an order according to their serial characteristics, they must be placed in file folders eventually for ease of description and retrieval. The folders themselves then can be numbered serially. The main reason, however, for seeking a serial arrangement instead of merely accepting or placing items in random order is that the relatedness of the documentation in the items will be more readily apparent when placed in proximity to other items that reflect any given line of thought or activity. In brief, action occurs serially, therefore the documentation is itself best arranged serially to reflect the line of action.

Record series are of many kinds depending largely on the form of the item(s). There will be, for example, correspondence (general, incoming and outgoing, and some memoranda), reports, minutes, various kinds of business records such as journals, ledgers, profit and loss statements, etc. Once the given manuscript group has been arranged, it is ready for description.

The kind of description can be in some variant of traditional library cataloging practice and can be done on catalog cards \(^2\) that are often supplemented with other descriptive apparatus, or it can be done by the method advocated here, or a variant thereof, a single finding aid network. If by a traditional method, there will be an attempt at description of individual items and selective cataloging of items deemed special. If by the latter, the description will be keyed to serial characteristics instead of items.

This network is analogous to that represented in the National Union Catalog of Manuscript Collections. It has, like the NUCMC volumes, cumulative indexes to names and subjects, but it has also an index to chronology. The crucial difference lies in the fact that the network is keyed to controls at the repository level, while NUCMC is keyed to the national level. In the network, index entries refer not to a catalog entry, but to the Inventory/Guide (or Register) for the particular manuscript group. In the I/G, in turn, the user will be referred to the particular container and file folder in which the item(s) is(are) stored. Just as in NUCMC there is a minimum of description, here also there are only the same kind of skeletal name and subject leads appearing in the cumulative index. These, in turn, refer the user to the I/G for the particular manuscript group. The guide section will contain whatever substantial narrative description there is, and will have the same elements in it that occur in NUCMC entries; but because space is less of a factor, there can be considerably more detail along with some additional narrative about the basic arrangement or layout of the manuscript group.

The guide section can be organized uniformly for all inventories, or it can be composed of differing and distinct elements, depending upon the manuscript group being inventoried. Some of the more typical elements of a guide include: biographical outline of the person, or historical sketch of the corporate body; chronology (of major events); genealogy (if clarification is helpful as in the case of family papers); provenance, telling about source, organic relation to other manuscript groups in collection, organic evolution of the papers; description of records (brief phys-

\(^2\) See the Anglo-American Cataloging Rules, pp. 259-71.
ical description indicating size of the manuscript group, types of records, etc.); general information (concerning overall arrangement of the manuscript group, significant features, abbreviations, etc.).

This guide section is then followed by the inventory proper. It is in the inventory that the whereabouts of the item(s), file folder(s), or series will be indicated. The inventory section will vary according to the arrangement of the different manuscript groups, for the arrangement, as noted above, will depend upon an original order if there was one or upon one devised by the repository.

The correspondence series normally is the most important one because letters tend to reflect most accurately the motives of the participants in an event or development. It is from the conflict of motives and ideas that decisions are shaped and made part of the historical and social process. Other record series lend documentary support to the correspondence series, although they will have an independent significance as well. The correspondence series is also crucial in another respect, for it is through this series that the control of names represented in the manuscript group is most easily established. Correspondence also is, or can be, the most variable in arrangement, being sometimes in a chronological order, or a chronological-alphabetical order, or by subject, or by a numerical scheme, or combinations of these. Shown below are representative examples of the more common arrangements and inventory descriptions of the correspondence series. Description of other series will be referred to after correspondence has been covered.

In some repositories, if the original order of a new accession is unworkable or in disarray, the incoming correspondence will be arranged alphabetically by correspondent, and the outgoing, chronologically, thereby providing a dual approach to the manuscript group.

In the example that follows, box and folder number are indicated as are the inclusive dates of the correspondence and the exact or approximate number of items. In this particular example the authors represented in the miscellaneous folders are also noted because they are deemed significant. All of these names or just those in the individual name folders can be entered in a Cumulative Name Index (CNI) of the repository. Thus, a user trying to locate information about James R. Barnes will be searching for material written by him and persons and organizations associated with him. From these leads he will progressively fan out. It is the CNI that provides these name leads by referring the researcher to the I/Gs for each of the manuscript groups listed under the name entry in the CNI. In turn, the inventory will indicate the particular box and folder having letters, for example, of James R. Barnes. Once he has read these he will then fan out in the manuscript group and in the manuscript collection as a whole according to the additional leads that he picks up. Proceeding from the resources of this one repository he can then consult NUCMC and move on from there in similar fashion. See Example 1.

By this alphabetical arrangement an objective basis for listing names of correspondents has thus been prepared. Furthermore there is normally a coincidence of a given name as both author and recipient in the correspondence series. Therefore it is largely unnecessary to list him where he is the recipient if he is already listed as author, for the researcher will usually be able to locate such letters easily. References to the name as recipient can be made but this requires the listing of individual letters, because they would be in the outgoing letters series which is arranged chronologically. To do so would, of course, give a more completely objective name control but at much greater ex-
pense, an added cost that the researcher probably does not require in order for him to find the pertinent items.

In general, reasonably objective listing can be achieved simply by author control in the incoming letter series. If it is decided, at the conclusion of processing a given manuscript group, that names as both author and recipient tend to coincide, the outgoing letters series can be described simply:

**EXAMPLE 2**

**OUTGOING LETTERS**

<table>
<thead>
<tr>
<th>Box/folder no.</th>
<th>Inclusive dates</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-(12-38)/25-(1-13)</td>
<td>1937-1944</td>
<td>ca. 465</td>
</tr>
</tbody>
</table>

In the case in which incoming and outgoing letters are kept together as general correspondence, objective name control is more difficult unless the general correspondence is arranged alphabetically by year or periods. Records of corporate bodies are often received in this order; as such, it is an easy one to describe, like any alphabetical arrangement. However, in cases where the general correspondence is in a chronological order, name control tends to be more subjective, posing a problem similar to that in reporting names of major correspondents to NUCMC or in any system that features a high degree of selectiveness.

In cases where incoming and outgoing letters have been filed together in chronological order, several avenues of approach are open depending upon the content and importance of the manuscript group and depending upon the anticipated demand. For example, the description can be either very general and keyed to the series levellike:

**EXAMPLE 3**

**GENERAL CORRESPONDENCE SERIES**

<table>
<thead>
<tr>
<th>Box/folder no.</th>
<th>Inclusive dates</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1 to 3/28</td>
<td>1942-1951</td>
<td>ca. 1050</td>
</tr>
</tbody>
</table>

Major Correspondents Include:

- Asice, Benjamin S.
- Bartley, Bruce
- Beck, Robert W.
- Block, Robert J.
- Chase, Goodwin
- Clark, Irving
- Davis, James
- Duecy, Georg P.

or the description can be more precise and keyed to control at the folder level like:

**EXAMPLE 4**

**GENERAL CORRESPONDENCE SERIES**

<table>
<thead>
<tr>
<th>Yr/Month/Day</th>
<th>Name</th>
<th>Box/folder no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912 Jan 1</td>
<td>Davis, James D.</td>
<td>5/1</td>
</tr>
<tr>
<td></td>
<td>Maxwell, David D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jones, Albert M.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Emery, Richard B.</td>
<td>5/2</td>
</tr>
<tr>
<td></td>
<td>Wallace, Neil W.</td>
<td></td>
</tr>
</tbody>
</table>

Another common filing arrangement for general correspondence is that in...
which subject and name folders are either mixed or separated, one into a subject series and the other by name of correspondent. It is the subject series that poses the special problem of control. This series typically contains correspondence, clippings, reports, leaflets, pamphlets, etc. If the original arrangement is kept, the file folder for that subject can be redistributed into several sub-folder units according to record type while retaining the original subject arrangement or kept randomly as they appear within that arrangement. The inventory description can be like Example 5 in a Congressman’s papers:

**EXAMPLE 5**

<table>
<thead>
<tr>
<th>Box/folder no.</th>
<th>Subject</th>
<th>Inclusive dates</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/3-6</td>
<td>Hells Canyon</td>
<td>1946</td>
<td>Correspondence with Gus Norwood, Richard Neuberger, National Hells Canyon Assn; reports, speeches, clippings.</td>
</tr>
<tr>
<td>10/7</td>
<td>Japan</td>
<td>1952</td>
<td>Correspondence with Miller Freeman, Alaska Fisherman's Union; reports, speeches, clippings re Alaska fisheries.</td>
</tr>
<tr>
<td>10/8</td>
<td>Home rule—D.C.</td>
<td>1950</td>
<td>Correspondence with John F. Kennedy. . . .</td>
</tr>
</tbody>
</table>

However, because names in the above examples will be scattered randomly throughout a subject series, a name index for the inventory must be made. The description can be like Example 6 for a lumber firm. These names would all appear in the CNI.

**EXAMPLE 6**

<table>
<thead>
<tr>
<th>Box/folder no.</th>
<th>Name</th>
<th>Year</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>51/10-20</td>
<td>Griggs, Everett G., Pres.</td>
<td>1920</td>
<td>ca. 100</td>
</tr>
<tr>
<td>21-40</td>
<td></td>
<td>1921</td>
<td>ca. 150</td>
</tr>
<tr>
<td>53/6-10</td>
<td>Jacobson, Norman G., Forester</td>
<td>1920</td>
<td>ca. 50</td>
</tr>
<tr>
<td>11-17</td>
<td></td>
<td>1921</td>
<td>ca. 75</td>
</tr>
<tr>
<td>55/1-5</td>
<td>Wagner, Corydon G., Vice-Pres.</td>
<td>1920</td>
<td>ca. 75</td>
</tr>
</tbody>
</table>

One can also be made for subjects for the inventory itself although subjects cannot be incorporated into the CSI without first being converted into standard headings, while the names can be entered directly into the CNI. From this description in the inventory, the names of court papers, legal briefs and ephemera, speeches and writings of others, are exceptions inasmuch as names as both subjects and authors are of central concern.

With some exceptions name control
is not the key to controlling other record series. Inasmuch as most other series document almost exclusively a single aspect of the overall activity of the person or organization, a chronological arrangement by series is both normal and easily described. Some examples are financial record series, minutes of meetings, and internal reports. However, if other parties (corporate or personal) have generated any record series or have activity that is primarily reflected (as in subgroups), name control should be of central concern again.

For example, if a person has included with his personal papers those of organizations with which he has been associated, subgroups should be established, if possible, for the record series of these organizations. By establishing organic subgroups there is meaningful conformity to a sound archival principle, that of provenance. And for the same reasons as for the manuscript group as a whole, this subgrouping is justified because it will reflect directly the serial evolution of that subunit’s activity, and description is made easier as well. Thus, Corydon Wagner’s papers include, besides his personal papers, those of the West Coast Lumbermen’s Association, of the National Lumber Manufacturers Association, and of the Chamber of Commerce of the United States. He was an official in each. In each of these organic subgroups are the usual kinds of records series: correspondence, reports, minutes, etc. Each subgroup is described in the same way as an undifferentiated manuscript group, that is, one without subgroups. However, because of the complexity added by having to subgroup the papers, it is best to have a name index to the inventory showing on which pages of the inventory names may be found. This name index can, in turn, be used for entering them into the CNI.

Some special attention is merited by the ephemera series. Ephemera are short-lived items such as pamphlets, leaflets, and broadsides generated in the heat of controversy; consequently, they have considerable historical value for the decisive way that they will often affect an event. Names of sponsors and publishers are often as important as personal authors represented on the same item, for ephemera are commonly generated by organizations, and personal authorship can be of less significance than that of the publisher or sponsor. All three kinds of names should be noted in the inventory and hence in the CNI. If there is a title, it can also be noted in the inventory, and if it is deemed sufficiently important or unique, there is no reason not to include the title in the CNI, as it can be placed easily into the alphabetical sequence of the index. Because a person or corporate body will often generate its own ephemera and receive it as well, the ephemera series can be divided into two subseries, one for its own, and one for other parties. The latter should be arranged alphabetically by either personal author or corporate author, sponsor, or publisher and described accordingly.

**Subject Headings**

Bearing in mind the function that name control plays in enabling the researcher to locate manuscript and archival material relating to his subject, some discussion of subject headings is relevant at this point.

Through the use of names, particularly personal and corporate, the researcher is keyed to individual file folders and to record series in the manner described above. Specific subject content is inferred by the name/subject association on the part of the researcher. It is up to him to check this inference by going to the individual file folders and record series to find out for himself the actual subject contents of the items found therein.
Of course the compiler of the inventory could attempt a minute subject analysis keyed to the item or the file folder level or to some grosser level, but where should the analysis and description stop? And should it be done with approximately equal weight and quality for each manuscript group in the collection? Will a subject reference made to one item or file folder be referred to when that subject occurs elsewhere? If not, what is to prevent the researcher from believing that he has exhausted all the material in the collection when he has consulted all subject references made in the findings aids of the repository? Will a new subject heading be retroactive and retrospective in its application? If the answer to these and related questions is largely negative, an alternative should be sought.

One alternative is to use broad subject headings for each of the main lines of human activity and relate these headings to the level of the manuscript group as a whole, not to the items or file folder units or series that make it up. Subject headings would characterize the main lines of activity reflected in that manuscript group. In establishing subject headings at the manuscript group level, and relying upon the name/subject association by the researcher as the main method of leading him to his specialized subject matter, the compiler of the inventory will largely avoid the pitfalls in traditional subject analysis. As there is need for experimentation in this troublesome area, no specific system is recommended here. However, the one being experimented with at the University of Washington is suggestive because it is an outgrowth of the name/subject association approach to manuscript and archival material. Briefly, it uses fourteen major subject headings for main lines of human activity, followed normally by one subject subdivision, followed by one for geographical place name. The above network system is based upon observation of the methods and techniques usually employed by researchers in their use of manuscript collections and archives. A researcher will already have read the published material relating to his subject. In the course of this reading he will have defined more precisely what aspect of it requires his attention, and he will minimize the hazard of duplicating what has already been done. He will also have read certain primary sources such as newspapers, government documents, pamphlets. In the course of this preliminary research he will have associated names of persons and organizations with his particular subject. He will, in fact, have done this so precisely and in so personal a manner that no describer of the manuscript group would be able to anticipate his needs. Whatever painstaking subject analysis of items and series that the describer might make would be largely a superfluous substitute for that minute name/subject association developed inherently by the researcher in his preliminary study.

A further consideration for the describer is that if he seriously attempts a minute subject analysis he will find himself bogging down into a description of individual items and selecting some bibliographic clues for mention while ignoring others. If this is done at the expense of establishing controls over other manuscript groups in the collection, it is largely without justification.

With this in mind it is clear that the kind of bibliographical control to be sought should: 1) have a high degree of name control, thereby capitalizing on

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6 Those fourteen headings are: agriculture, art, commerce, education, industry, international relations, labor relations, literature, politics and government, population, religion, science, travel, and war. Their use is defined by scope notes.
the basic methodology of researchers; and 2) employ subject control keyed to manuscript group level, not at the file folder or item level.

To employ the network system the following elements are used:

**Cumulative Name Index**

Index to all personal, corporate, geographical names deemed significant. May include titles of items as well.

**Cumulative Subject Index**

Index to subject matter that is characteristic of each manuscript group and its subgroups, but not of its component items and series.

**Chronological Index**

Index listing manuscript groups which fall within a particular time span (year or period).

**Inventory/Guide or Register**

The three (3) cumulative indexes are keyed to and derived from the individual I/Gs or Registers.

**Basic Data Sheet**

Data includes name of manuscript group, date span, type of material, location within repository, size, donor and date of acquisition. Supplementary information can include major correspondents, significant biographical features, restrictions, literary property rights, and subjects covered. This is made up at time of accessioning and can have tentative subject headings. Serves as a preliminary I/G.

A researcher seeking available information on a given problem can approach it through the use of the Cumulative Name Index, the Cumulative Subject Index, or the Chronological Index. If, for example, the researcher is developing a study of the Seattle General Strike (February 1919), he normally would have read newspaper and other eyewitness accounts as well as most secondary source materials prior to using the primary materials of the manuscript repository. From this reading he would have learned the names and dates and determined the special aspects of his subject requiring investigation. His basic approach may be by way of year (1919) using the chronological index, by subject (Labor relations—strikes—Washington and Politics and government—Washington—Seattle) using the CSI, or by name (in Example 7, Wesley L. Jones) in the CNI. It is through these indexes that the researcher is led to the appropriate I/Gs and from them to the particular materials desired.

Examples 7, 8, and 9 illustrate that each of these cumulative indexes will lead him to the Erastus Brainerd papers. The CNI sheet (Example 7) indicates that material concerning Wesley L. Jones can be found in the papers of Erastus Brainerd, Miller Freeman, the St. Paul and Tacoma Lumber Company, and many other manuscript groups. The Brainerd papers also are listed in the CSI (Example 8) and in the Chronological Index (Example 9). However, because only a few items in the Brainerd papers touch upon the strike, his papers would not be listed under “Labor relations—strikes—Washington.” The reason for this is that subject headings are keyed to the level of the manuscript group, not to items or series. Brainerd was a newspaper editor active in Republican politics who had only an incidental connection with the strike. However, by contrast the papers of James Duncan, a strike leader, relate directly to the strike, so his papers will be listed under “Labor relations—strikes—Washington” as well as under “Politics and government—Washington—Seattle.”

Following the lead in the CNI the researcher might especially want to see the correspondence of Wesley L. Jones in the Brainerd papers. By viewing the
EXAMPLE 7

Examples are one-half actual size. Inclusive dates refer to time spanned by manuscript group.

For manuscripts of the above, see Guides to the following collections:

<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>Collection</th>
<th>Inclusive Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>JONES, Wesley Livsey, 1863-1932</td>
<td>1891-1946</td>
<td>UW LIR MSS COLL</td>
<td>1891-1946</td>
</tr>
<tr>
<td>CHADWICK, Stephen J</td>
<td>1912-1956</td>
<td>UW LIR MSS COLL</td>
<td>1912-1956</td>
</tr>
<tr>
<td>REDONALD H. THOMSON PAPERS</td>
<td>1874-1940</td>
<td>UW LIR MSS COLL</td>
<td>1874-1940</td>
</tr>
<tr>
<td>PORTER &amp; HARTMAN CORP</td>
<td>1974-1923</td>
<td>UW LIR MSS COLL</td>
<td>1974-1923</td>
</tr>
<tr>
<td>JAY JORDAN PAPERS</td>
<td>1910-1929</td>
<td>UW LIR MSS COLL</td>
<td>1910-1929</td>
</tr>
</tbody>
</table>

Seattle: Port Commission | 1911-1949 | Freeman, Miller | 1919-1949 |

EXAMPLE 8

- Politics and government - Washington - Seattle

For manuscripts relating to the above SUBJECT see Guides to the following collections:

<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>Collection</th>
<th>Inclusive Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELIOT MILLER PAPERS</td>
<td>1931-1944</td>
<td>UW LIR MSS COLL</td>
<td>1931-1944</td>
</tr>
<tr>
<td>HENRY SCHWARTZ PAPERS</td>
<td>1930-1965</td>
<td>UW LIR MSS COLL</td>
<td>1930-1965</td>
</tr>
<tr>
<td>SIDNEY GERBER PAPERS</td>
<td>1942-1965</td>
<td>UW LIR MSS COLL</td>
<td>1942-1965</td>
</tr>
<tr>
<td>COE, Earl S</td>
<td>1939-1956</td>
<td>UW LIR MSS COLL</td>
<td>1939-1956</td>
</tr>
<tr>
<td>JANET J. CODYNITY PAPERS</td>
<td>1924-1932</td>
<td>UW LIR MSS COLL</td>
<td>1924-1932</td>
</tr>
<tr>
<td>MCCONNELL, H.</td>
<td>1880-1919</td>
<td>UW LIR MSS COLL</td>
<td>1880-1919</td>
</tr>
<tr>
<td>LOCKWOOD, EVELYN E</td>
<td>1933-1938</td>
<td>UW LIR MSS COLL</td>
<td>1933-1938</td>
</tr>
<tr>
<td>WOLFSTONE, Michael</td>
<td>1933-1938</td>
<td>UW LIR MSS COLL</td>
<td>1933-1938</td>
</tr>
<tr>
<td>BAILLIE, Richard A</td>
<td>1907-1922</td>
<td>UW LIR MSS COLL</td>
<td>1907-1922</td>
</tr>
</tbody>
</table>

Name Index to the Brainerd Inventory (an index to the I/G itself is necessary wherever a name appears randomly or in more than one unexpected place in the I/G) he will find that the name Wesley L. Jones appears on pages 7, 9, 12, and 16 of the inventory (Example 10). Information on page 7 of the inventory shows that 115 letters were written by Jones to Brainerd between the
years 1902 and 1919, and it also shows their location within the manuscript group (box 14, folders 1 to 18, as in Example 11). The repository clerk can then check the Data Sheet (Example 12) of the Erastus Brainerd Manuscript group to determine its location within the repository and retrieve the file folders for the researcher.

In the example (11) shown a book index using looseleaf forms is utilized. Catalog cards can also be used, however, at greater expense. The only information needed would be the name, subject, or date at the top of the card followed by names of the pertinent manuscript groups on the body of the card. In using the card form an alternative would

### Example 10
The Erastus Brainerd Papers, 1880-1919
Name Index

<table>
<thead>
<tr>
<th>Name</th>
<th>Box/folder No.</th>
<th>Inclusive dates</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams, John, *</td>
<td></td>
<td>3, 6, 7</td>
<td></td>
</tr>
<tr>
<td>Cain, Harry Pulliam, 5</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Douglas, Frederick, *</td>
<td></td>
<td>5, 8</td>
<td></td>
</tr>
<tr>
<td>Harris, Benjamin, 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones, Wesley L., *</td>
<td>7, 9, 12, 16</td>
<td>14, 16</td>
<td></td>
</tr>
</tbody>
</table>

Note: Starred names have been entered in the Cumulative Name Index.

<table>
<thead>
<tr>
<th>Name</th>
<th>Box/folder No.</th>
<th>Inclusive dates</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewis, Richard, 14</td>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>March, Harry, *</td>
<td></td>
<td>17, 18</td>
<td></td>
</tr>
<tr>
<td>Simpson, Howard, 34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyler, Francis, 49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington, George, *</td>
<td></td>
<td>13, 49</td>
<td></td>
</tr>
</tbody>
</table>

### Example 11
The Erastus Brainerd Papers, 1880-1919
Incoming Letters

<table>
<thead>
<tr>
<th>Name</th>
<th>Inclusive dates</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chadwick, Stephen J.</td>
<td>1896-1918</td>
<td>38</td>
</tr>
<tr>
<td>Dilling, George</td>
<td>1908-1911</td>
<td>3</td>
</tr>
<tr>
<td>Hoge, James</td>
<td>1902-1916</td>
<td>10</td>
</tr>
<tr>
<td>Jones, Wesley L.</td>
<td>1902-1919</td>
<td>115</td>
</tr>
</tbody>
</table>
Examples of Manuscript Collections

1. Name of accession: **BRAINERD, Erastus, 1855-1922**

2. Type of material: Correspondence, mainly incoming letters, with some memorabilia, 1880-1919.


4. Size: ca. 2900 items.

5. Source: Bequest of The Brainerd Estate, June 1922.

6. Biographical features:
   See:
   3. Dictionary of American Biography

   See also Microfilms A 1698, A 921 in Newspapers-Microcopy Section

7. Names of major correspondents:
   See inventory

8. Special restrictions:
   none

9. Literary property rights:
   In public domain

10. Subjects covered:

    Commerce - Alaska
    Commerce - Washington - Seattle
    Literature - journalism - Washington - Seattle
    Industry - newspaper publishing - Washington - Seattle
    Politics and government - Washington - Seattle

    Republican Party (as subject)

    Geographical names: Alaska

    Note: Geographical entries are made only for non-Washington focused manuscript groups.

University of Washington Library
Lib. 91
be to make a fresh card for each entry. Once the main entry is established a unit card for the manuscript group could be multilithed and used for making added entries.

In the network system outlined above it is clear that a high degree of name control is established. Furthermore, that control is not dependent on the arrangement of the manuscript group; whatever the arrangement is, it can be described. In addition, it is keyed normally to the file folder for the correspondence series, to the record series itself for most other series, and to the manuscript group level for general subject matter. The bibliographic search is thereby simple, direct, and objective. It proceeds, in fact, in much the same way as machine retrieval and is similarly free of narrative descriptive apparatus, because that kind of description is unnecessary in this system. For this reason it is also relatively less expensive than methods that depend on minute subject analysis, and in which the card catalog is the main finding aid. A great saving is made by avoiding the use of relatively expensive catalog cards with attendant typing and filing of individual cards that frequently repeat information. Instead, looseleaf sheets are filed in post-binders for each of the cumulative indexes; on these looseleaf sheets only the names of the pertinent groups are posted. For the researcher it is a simple, direct system much like that of NUCMC in which skeletal name, subject, and temporal leads are followed step by step to the manuscript material itself. There is an inexpensive way of adapting it to an existing card catalog system. Adaptation is easiest for names. The problem is to refer the user of the card catalog to the manuscripts reference service for material with which a given name is identified. Assuming that name already appears in the catalog, all subsequent references need to be placed on one card only in the catalog for that name. That card can read:

<table>
<thead>
<tr>
<th>Jones, Wesley Livsey (1863-1932)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For other references to this name inquire at Service Desk.</td>
</tr>
</tbody>
</table>

Subject headings could be handled similarly, although this in turn would depend on the kind of subject headings the repository decides to employ and to what record levels they refer. Chronology poses no special problem.

● ●
Doctoral Degrees and Library Resources

This paper brings up to date a similar report which was published in College & Research Libraries in 1966 showing the relationship between library holdings and the number of doctoral degrees granted in several American universities. Correlation between the two remains high. Generally speaking, the strongest graduate offerings are at institutions with the strongest libraries.

A study published in 1966 revealed a close relationship between doctoral degrees conferred by American universities and library resources and support. The recent publication of the 10th edition of *American Universities and Colleges* provides an opportunity to update the previous investigation. In a tabular summary of "Earned Doctorates, 1957–1966, by Field and Institution," the ACE directory presents the number of degrees awarded by each institution. The figures are broken down further by broad categories: humanities, biological sciences, physical sciences, social sciences, and a miscellaneous group not classifiable by fields.

A total of 214 universities, colleges, seminaries, institutes, and schools are listed by *American Universities and Colleges* as having conferred five or more doctoral degrees during the decade 1957–66. For present purposes, only those institutions granting one hundred or more degrees in the course of the ten-year period are considered—a total of 120 universities or other institutions of higher education. The accompanying table includes the selected group, rearranged in the order of the number of degrees conferred. The two final columns report for each library the number of volumes held and the total expenditures for books, periodicals, and binding as of 1966, the final year covered by the ten-year record of statistics of doctoral degrees.

According to the ACE summary, 121,750 doctoral degrees were granted by American universities and colleges during the decade. Of the total, 77,465 degrees, or about 64 per cent (nearly two-thirds), came from thirty-eight institutions with library holdings in excess of a million volumes each. The mean figure for the thirty-eight libraries was 2,135,565 volumes.

A close correlation existed also between the number of degrees conferred and the level of financial support. The forty universities whose libraries spent more than $500,000 each for books, periodicals, and binding in 1965–66 granted a total of 79,126 doctoral degrees, or 65 per cent of the whole figure of 121,750.


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Dr. Downs is Dean of Library Administration in the University of Illinois.
The list of degree-granting institutions was headed by the University of California, which awarded 6,981 doctorates during the decade. The total represents seven campuses, but 4,869 degrees came from Berkeley and Los Angeles combined, both owning multi-million volume libraries.

Book collections and expenditures have continued to expand since the 1966 figures were compiled. As reported in the Association of Research Libraries' "Academic Library Statistics" for 1967-68, fifty-one of the seventy member libraries possessed more than a million volumes each and eleven more were on the verge of reaching the million-volume level at the end of the year. In expenditures for books and binding, twenty-six of the seventy exceeded $1,000,000 each for 1967-68; sixty of the seventy had book expenditures above $500,000 for the year.

A distinction should be made among several principal types of institutions included in the select group of 120. First, there are the general universities, encompassing virtually all fields. Second, there are a score or more of former A. and M. state colleges recently converted into general universities, since which time a majority have been actively engaged in developing major general libraries. Examples are Purdue, Iowa State, Pennsylvania State, Oregon State, Oklahoma State, Texas A. & M., North Carolina State, Washington State, Kansas State, Auburn, Utah State, Colorado State, and Montana State. A third recognizable category is the specialized technical institutions—California Institute of Technology, Carnegie Institute of Technology, Polytechnic Institute of Brooklyn, Rensselaer Polytechnic Institute, Illinois Institute of Technology, Virginia Polytechnic Institute, Case Institute of Technology, and Georgia Institute of Technology—which confer degrees primarily in the physical and biological sciences, and whose library requirements, therefore, are considerably less diverse than are those of general universities dealing with all fields. Another group of specialized institutions, a small one, is represented by the New School for Social Research, the Southwestern Baptist Theological Seminary, and the Union Theological Seminary.

Purely from a pragmatic point of view, one may conclude that quantitatively a library in a university offering comprehensive doctoral programs should possess a minimum of 1,500,000 volumes and ought to be spending not less than $750,000 annually for books, periodicals, and binding. Among the thirty-four universities which granted an average of one hundred doctorates a year, or more, during the 1957-66 period, twenty-two met the suggested standard for volume holdings, as of July 1, 1968, and twenty-nine of the thirty-four spent in excess of $750,000 each for books.

In summary, statistics of doctoral degrees granted and of library holdings and book expenditures strongly support the view that there is a high degree of correlation between the two in universities distinguished for their doctoral programs. With rare exceptions, an institution outstanding for its graduate offerings is equally notable for the strength of its library resources. It is perhaps equally obvious that a number of institutions granting the doctorate lack the library resources to support advanced level graduate study and need to undertake extensive development of their libraries.
## Doctoral Degrees Awarded, 1957-1966, and Library Resources

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<th>Institution</th>
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<th>Physical Sciences</th>
<th>Social Sciences</th>
<th>Miscellaneous</th>
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<td>488,056</td>
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</table>
Patterns of Use of Periodical Literature

Questionnaires were distributed to a scientifically selected sample of graduate students in the University of Michigan querying their use of periodical literature in libraries. Tabulated results indicate that this user group utilizes periodicals heavily, that citations are most often sought by subject, that only one or two articles are usually read per library use, and that most such library users are successful in their search for information.

The automation of serial literature records now taking place in many libraries provides a propitious opportunity to enhance the information output of these records for the library user as well as for the librarian. While librarians generally know what information they require of their records, there is no certainty about the information requirements placed upon these same records by library users. This report is the result of a study to determine the patterns of student use of one segment of serial literature, periodicals, in a research library system. Such a definition of use patterns is one of the essential steps in developing mechanized serial records of value to library staff and patron alike.

The study was conducted at the University of Michigan in the early spring of 1968. A questionnaire was mailed to a sample of students enrolled in the Horace H. Rackham School of Graduate Studies of the university. It contained seven basic questions, of which three had one or more subquestions. Most of the questions were constructed to elicit responses based upon the last time the student had actually used periodical literature in a library of the university. Of the 399 questionnaires that were mailed, 338, or 85 per cent, were returned and capable of tabulation.

Tabulation and Analysis of Questionnaires

Question 1. “How often do you use libraries of the University of Michigan?”

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost never</td>
<td>3%</td>
</tr>
<tr>
<td>A few times a term</td>
<td>8%</td>
</tr>
<tr>
<td>About once a month</td>
<td>4%</td>
</tr>
<tr>
<td>Once in two or three weeks</td>
<td>7%</td>
</tr>
<tr>
<td>About once a week</td>
<td>31%</td>
</tr>
<tr>
<td>Almost every day</td>
<td>40%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

N = 338

Every respondent who marked “Other” specified library use of at least once a week. Including this 7 per cent, it must be noted that 78 per cent of the students indicated library use about once a week.

1 Research funds for this project were provided by the Xerox Corporation Graduate Fellowship in Information Science, and were granted through the Institute of Science and Technology of the University of Michigan.

2 The details of the sampling procedure, as well as the design of the questionnaire, were developed in consultation with staff members of the Institute for Social Research of the University of Michigan.

3 Periodical literature is defined in a note following Question 1 of the Questionnaire (see pages 428-9). The definition is arbitrary and was used only to establish a common understanding of periodical literature for the purposes of this particular study.

Mr. Peterson is Head of the Order and Receiving Department in the Joint University Libraries, Nashville.
Question 2. "When did you last use periodical literature of a University library?"

**TABLE 2**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or three days ago</td>
<td>41%</td>
</tr>
<tr>
<td>About a week ago</td>
<td>20%</td>
</tr>
<tr>
<td>Two to three weeks ago</td>
<td>11%</td>
</tr>
<tr>
<td>About a month ago</td>
<td>6%</td>
</tr>
<tr>
<td>More than a month ago</td>
<td>6%</td>
</tr>
<tr>
<td>Have not used this term</td>
<td>16%</td>
</tr>
<tr>
<td>Total</td>
<td>N = 338</td>
</tr>
</tbody>
</table>

The questionnaire was mailed at such a time as to reflect extensive library use in the given term. The 54 respondents (16 per cent) who indicated that they had not used periodical literature in a University library in the term were not required to complete the questionnaire. Of all respondents (338), 61 per cent used periodical literature about once a week. Of those who reported use of periodical literature in the given term (284), however, the percentage of weekly users climbed to 72 per cent.

**Question 4. A. Location and Age of Periodical Literature Used.**

**TABLE 4**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Medical Sciences</th>
<th>Sciences</th>
<th>Non-Sciences</th>
<th>Undergraduate</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or three days ago</td>
<td>69%</td>
<td>61%</td>
<td>42%</td>
<td>22%</td>
<td>41%</td>
</tr>
<tr>
<td>About a week ago</td>
<td>8%</td>
<td>19%</td>
<td>28%</td>
<td>22%</td>
<td>30%</td>
</tr>
<tr>
<td>Two to three weeks ago</td>
<td>14%</td>
<td>6%</td>
<td>13%</td>
<td>28%</td>
<td>14%</td>
</tr>
<tr>
<td>About a month ago</td>
<td>3%</td>
<td>3%</td>
<td>9%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>More than a month ago</td>
<td>6%</td>
<td>11%</td>
<td>6%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>N = 36</td>
<td>N = 64</td>
<td>N = 62</td>
<td>N = 18</td>
<td>N = 104</td>
</tr>
</tbody>
</table>

Of the 264 users who indicated they visited a University library about once a week, and of the 204 respondents who used periodical literature about once a week, 190 indicated use of a library and use of periodical literature in that period of time. This represents 56 per cent of all library users, and fully 67 per cent of all users of periodical literature in the given term.

Question 3. "Check the University library which you last visited to use periodical literature."

The respondents were asked whether they had read current (i.e., less than one year old) or non-current (i.e., more than one year old) literature, and whether this material had been in a reserve reading collection.

**TABLE 5**

<table>
<thead>
<tr>
<th>Reading Category</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Reserve reading</td>
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</tr>
<tr>
<td>Current literature</td>
<td>29%</td>
</tr>
<tr>
<td>Non-current literature</td>
<td>35%</td>
</tr>
<tr>
<td>Both current and non-current</td>
<td>16%</td>
</tr>
<tr>
<td>literature</td>
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</tr>
<tr>
<td>No response</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>N = 284</td>
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</tbody>
</table>
The division of these results by type of library (Table 6) reveals about what might be expected. Current periodical literature is used more in the medical and science libraries, while non-current periodical literature shows substantial use in the general library.

### Table 6

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Sciences</th>
<th>Non-Sciences</th>
<th>Undergraduate</th>
<th>General</th>
</tr>
</thead>
<tbody>
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<td>Reserve reading</td>
<td>3%</td>
<td>8%</td>
<td>13%</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td>Current literature</td>
<td>42%</td>
<td>30%</td>
<td>31%</td>
<td>17%</td>
<td>25%</td>
</tr>
<tr>
<td>Non-current literature</td>
<td>33%</td>
<td>31%</td>
<td>24%</td>
<td>33%</td>
<td>45%</td>
</tr>
<tr>
<td>Both current and non-current literature</td>
<td>14%</td>
<td>23%</td>
<td>19%</td>
<td>22%</td>
<td>10%</td>
</tr>
<tr>
<td>No response</td>
<td>8%</td>
<td>6%</td>
<td>13%</td>
<td>6%</td>
<td>-</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>36</td>
<td>64</td>
<td>62</td>
<td>18</td>
<td>104</td>
</tr>
</tbody>
</table>

### Question 4. B. Purpose for Which Periodical Literature Was Used.

### Table 7

<table>
<thead>
<tr>
<th>Purpose for Reading</th>
<th>Medical</th>
<th>Sciences</th>
<th>Non-Sciences</th>
<th>Undergraduate</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>General/professional reading</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research reading</td>
<td>65%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both general/professional and research</td>
<td>7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>284</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When these returns are considered by type of library, the percentages are as shown in Table 8.

### Table 8

<table>
<thead>
<tr>
<th>Purpose for Reading</th>
<th>Science and Medical Libraries</th>
<th>All other Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>General/professional reading</td>
<td>15%</td>
<td>23%</td>
</tr>
<tr>
<td>Research reading</td>
<td>71%</td>
<td>63%</td>
</tr>
<tr>
<td>Both general/professional and research</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>No response</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>100</td>
<td>184</td>
</tr>
</tbody>
</table>

Of the 57 respondents (20 per cent, Table 7) who indicated that they were doing general/professional reading, 32 also indicated that they were reading current periodical literature. It might have been expected that general reading was being done in the most recent literature. Of all students reading current periodical literature, however, 60 per cent stated that they were using this material specifically for research purposes.

**Question 5.** “How many articles did you read in the last periodical you used in a University library?”

Three students marked “Other.” Of these, two indicated that they had skimmed the periodical. One said that he had read none of the articles. There did not seem to be any significant variation in the responses to this question among the users of the various groups of libraries.

4 “Article” was defined in the questionnaire to include book reviews. See note following Question 3.
Patterns of Use of Periodical Literature / 425

TABLE 10
NUMBER OF ARTICLES READ/PURPOSE FOR WHICH PERIODICAL WAS USED

<table>
<thead>
<tr>
<th>Purpose</th>
<th>General/professional</th>
<th>Research</th>
<th>Both</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>17%</td>
<td>70%</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>Two</td>
<td>27%</td>
<td>61%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Several</td>
<td>29%</td>
<td>63%</td>
<td>12%</td>
<td>3%</td>
</tr>
<tr>
<td>Most</td>
<td>25%</td>
<td>42%</td>
<td>25%</td>
<td>8%</td>
</tr>
<tr>
<td>All</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
</tr>
<tr>
<td>Other</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
</tr>
<tr>
<td>No response</td>
<td>N = 57</td>
<td>N = 186</td>
<td>N = 20</td>
<td>N = 21</td>
</tr>
</tbody>
</table>

TABLE 11
NUMBER OF ARTICLES READ/LOCATION AND AGE OF PERIODICAL

<table>
<thead>
<tr>
<th>Location</th>
<th>Reserve</th>
<th>Current</th>
<th>Non-current</th>
<th>Both</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>18%</td>
<td>25%</td>
<td>38%</td>
<td>14%</td>
<td>5%</td>
</tr>
<tr>
<td>Two</td>
<td>10%</td>
<td>31%</td>
<td>37%</td>
<td>18%</td>
<td>4%</td>
</tr>
<tr>
<td>Several</td>
<td>4%</td>
<td>36%</td>
<td>33%</td>
<td>20%</td>
<td>7%</td>
</tr>
<tr>
<td>Most</td>
<td>25%</td>
<td>17%</td>
<td>17%</td>
<td>33%</td>
<td>8%</td>
</tr>
<tr>
<td>All</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td>(insufficient responses)</td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>N = 39</td>
<td>N = 82</td>
<td>N = 100</td>
<td>N = 47</td>
<td>N = 16</td>
</tr>
</tbody>
</table>

Question 6. Means Used to Determine What Article(s) to Read.

TABLE 12

Had precise reference to article already 49.3%
Did not have precise reference already 50.0%
No response 0.7%
N = 284

Twenty-nine (21 per cent) of the 140 students who indicated, as shown in Table 12, that they already had the precise citation to the article they wished to read also noted that they were reading material in a reserve reading collection.

Exactly 50 per cent (142) of the respondents noted that, prior to using the library resources, they did not have the accurate reference to the material they wished to read. Table 13 shows the means by which these users located the article(s) they needed.

Of all the respondents surveyed, only 50 (35 per cent, Table 13) neither had the precise reference to the article(s)

TABLE 13

<table>
<thead>
<tr>
<th>Usage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used an index</td>
<td>44%</td>
</tr>
<tr>
<td>Used an abstract</td>
<td>13%</td>
</tr>
<tr>
<td>Used both an index and an abstract</td>
<td>8%</td>
</tr>
<tr>
<td>Did not use either an index or an abstract</td>
<td>35%</td>
</tr>
</tbody>
</table>

they wished to read nor found that citation by using an indexing or abstracting service of the library. These 50 students represent 18 per cent of the total respondents (284). Table 14 gives a closer look at this 18 per cent.

TABLE 14

Consulted periodicals by publishing society 18%
Consulted periodicals by subject 86%
Consulted periodicals by country of publication 4%
Consulted periodicals by language of publication
Consulted periodicals by period of publication 8%
N = 50

5 It was possible to check more than one category in Question 6.
The ninety-two students who did not have the precise reference to the material they wished to read prior to using the library, but who determined that reference by using bibliographical tools of the library, showed a similar pattern in their approach to periodicals, as demonstrated in Table 15.

Tables 16-18 further describe the patterns of use of the fifty respondents who neither had the needed reference nor used an index or abstract, and contrast these findings with the use patterns of the other two groups, i.e., those who already had the reference, and those who used an index and/or abstract to determine the reference.

### Table 15
Consulted periodicals by publishing society 15%  
Consulted periodicals by subject 65%  
Consulted periodicals by country of publication 4%  
Consulted periodicals by language of publication 2%  
Consulted periodicals by period of publication 14%  
No response 14%  
N = 92

### Table 16
<table>
<thead>
<tr>
<th>Location and Age of Periodical Literature Used</th>
<th>No Reference</th>
<th>Had Reference</th>
<th>Used Index or Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve reading</td>
<td>6%</td>
<td>21%</td>
<td>8%</td>
</tr>
<tr>
<td>Current literature</td>
<td>52%</td>
<td>17%</td>
<td>34%</td>
</tr>
<tr>
<td>Non-current literature</td>
<td>26%</td>
<td>41%</td>
<td>31%</td>
</tr>
<tr>
<td>Both current and non-current literature</td>
<td>10%</td>
<td>17%</td>
<td>19%</td>
</tr>
<tr>
<td>No response</td>
<td>6%</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>N = 50</td>
<td>N = 140</td>
<td>N = 92</td>
<td></td>
</tr>
</tbody>
</table>

### Table 17
<table>
<thead>
<tr>
<th>Purpose for Which Periodical Literature Was Used</th>
<th>No Reference</th>
<th>Had Reference</th>
<th>Used Index or Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>General/professional reading</td>
<td>38%</td>
<td>13%</td>
<td>21%</td>
</tr>
<tr>
<td>Research reading</td>
<td>44%</td>
<td>69%</td>
<td>71%</td>
</tr>
<tr>
<td>Both general/professional and research reading</td>
<td>8%</td>
<td>9%</td>
<td>4%</td>
</tr>
<tr>
<td>No response</td>
<td>10%</td>
<td>9%</td>
<td>4%</td>
</tr>
<tr>
<td>N = 50</td>
<td>N = 140</td>
<td>N = 92</td>
<td></td>
</tr>
</tbody>
</table>

### Table 18
<table>
<thead>
<tr>
<th>Number of Articles Read</th>
<th>No Reference</th>
<th>Had Reference</th>
<th>Used Index or Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>32%</td>
<td>61%</td>
<td>51%</td>
</tr>
<tr>
<td>Two</td>
<td>16%</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>Several</td>
<td>38%</td>
<td>14%</td>
<td>31%</td>
</tr>
<tr>
<td>Most</td>
<td>10%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>All</td>
<td>—</td>
<td>—</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>0.7%</td>
<td>—</td>
</tr>
<tr>
<td>No response</td>
<td>—</td>
<td>1.3%</td>
<td>—</td>
</tr>
<tr>
<td>N = 50</td>
<td>N = 140</td>
<td>N = 92</td>
<td></td>
</tr>
</tbody>
</table>
Question 7. Success in Finding Periodical Literature.

TABLE 19

| Respondents who found the article | 80.3% |
| Respondents who did not find the article for which they were looking | 16.9% |
| No response | 2.8% |

Respondents who indicated that they were unable to find the article or the periodical for which they were looking were asked what information regarding the material they were able to find. Table 20 shows the results.

TABLE 20

| Periodical was in the library being used, but was unavailable | 44% |
| Periodical was in another library | 17% |
| Periodical was not in any library of the University | 19% |
| Other information | 10% |
| No information | 8% |
| No response | 2% |

Seventy-three per cent of those students who did not find the periodical for which they were looking were searching for a non-current publication. Forty-four per cent of these respondents had the precise reference to the article they wished to consult, and fully 67 per cent of these students indicated that they used periodical literature in a University library at least once a week.

SUMMARY

The purpose of this project was to define the patterns of use of periodical literature as demonstrated by graduate students working in a research library system. Patterns, even when based upon measured responses to actual incidents of use, primarily serve as guides and, as such, only indicate general trends. The following patterns are those which are clearly evident from the results of this study.

Periodical literature receives substantial use. Eighty-four per cent of the students surveyed indicated use of periodical literature in the given school term. Sixty per cent indicated use of periodical literature at least once a week. Moreover, periodical literature is heavily used by the students who are the most frequent and steady patrons of University libraries. Thus, the significance of periodical literature for graduate students is demonstrated on both an absolute and a proportional scale of use.

Periodical literature seems no less important for nonscience libraries than it is for the libraries related to the several sciences. The respondents who indicated that they used periodical literature at least once a week encompass 79 per cent of all users of science libraries, and 68 per cent of all users of nonscience libraries.

II

The subject approach to periodical literature is the dominant approach used by graduate students. This is true for the students who did not have the precise reference to the article they wished to read, as well as for the students who located the reference to their needed article through an index or abstracting service. The preference for the subject approach was so strong it would indicate that other indexing schemes, e.g., indexing by publishing society, language, period, country, etc., ought to be employed only in the most rare and specialized instances.6

6Of course, student preference for the subject approach may be due to the fact that little service is presently offered through other bibliographical avenues. Further conclusions about these other approaches should be made only after our library patrons have had considerable experience using these other means. See G. A. Miller, "Measuring User Needs and Preferences," Interex Report of a Planning Conference on Information Transfer Experiments (Cambridge: MIT Press, 1965), p. 56.
QUESTIONNAIRE

1. How often do you use libraries of the University of Michigan?
   ( ) Almost never       ( ) About once a week
   ( ) A few times a term ( ) Almost every day
   ( ) About once a month ( ) Other (specify) ......................
   ( ) Once in 2 to 3 weeks

N.B. PERIODICAL LITERATURE in the following questions refers to publications issued at more or less regular intervals. These publications usually contain articles by several contributors. PERIODICAL LITERATURE includes magazines, journals, annual reports, and society proceedings and transactions. EXCLUDED are newspapers and government documents.

2. When did you LAST use periodical literature of a University library?
   ( ) Two or three days ago
   ( ) About a week ago
   ( ) About two or three weeks ago
   ( ) About a month ago
   ( ) More than a month ago
   ( ) Have not used periodical literature of a University library this term

If you have not used periodical literature of a University library this term, you need not answer the remaining questions. Please return this questionnaire in the enclosed envelope.

3. Check the University library which you LAST visited to use periodical literature.
   ( ) Architecture
   ( ) Asia (in General Lib.)
   ( ) Business Administration
   ( ) Bureau of Government (in basement of Rackham Bldg.)
   ( ) Chemistry-Pharmacy
   ( ) Dentistry
   ( ) Education (in Undergraduate)
   ( ) Engineering-Transportation (in Undergraduate)
   ( ) Fine Arts
   ( ) Institute of Science and Technology
   ( ) General
   ( ) Law
   ( ) Library Science
   ( ) Mathematics
   ( ) Medical Center
   ( ) Mental Health Research
   ( ) Music
   ( ) Natural Sciences-Natural Resources
   ( ) Phoenix
   ( ) Physics-Astronomy
   ( ) Public Health
   ( ) Social Work
   ( ) Undergraduate
   ( ) Other (specify) ......................

N.B. ARTICLES in the following questions include book reviews.
4. When you LAST visited a University library to use periodical literature, were you looking for

A. ( ) Periodical literature in a reserve reading collection?
   ( ) Current periodical literature (one year old or less)?
   ( ) Non-current periodical literature (more than one year old)?

B. ( ) Articles of a general professional or informative nature?
   ( ) Articles for some definite research or scholarly use?

5. How many articles did you read in the LAST PERIODICAL you used in a University library?
   ( ) One, ( ) Two, ( ) Several, ( ) Most, ( ) All, ( ) Other .........

6. When you LAST visited a University library to use periodical literature, which of the following approaches did you use to determine what article(s) you wished to read?

   ( ) Consulted periodicals published by a society in which I am a member or interested.
   ( ) Consulted periodicals in my subject field.
   ( ) Consulted periodicals published in the country of my interest.
   ( ) Consulted periodicals published in the language of my interest.
   ( ) Consulted periodicals published in the chronological period of my interest.

   If you checked ANY of the above, did you at any time use the table of contents or the index of the periodical? ( ) Yes, ( ) No.

   ( ) Consulted one or more general index (indexing several periodicals).
   ( ) Consulted one or more abstracting periodicals.
   ( ) Already had the reference from some other source.
   ( ) Other (specify) ............................

7. When you LAST visited a University library to use periodical literature, were you able to find the periodical for which you were looking in the library you were using? ( ) Yes, ( ) No.

   If NO, what information about the periodical you wished to use were you able to find out? (check all that apply).

   ( ) It was in the library I was using, but was not available.
   ( ) It was not in the library I was using, but was in some other library of the University.
   ( ) It was not available in any University library.
   ( ) No information.
   ( ) Other information (specify) ..........................

In the space below, please add any additional comments about library service of the University as you have found it in relation to periodical literature.

Thank you.
The overwhelming number of library users among graduate students approach the use of periodical literature well prepared to find the article which they need. Nearly half of the respondents already had the precise reference to the article they needed before they began to use library materials and aids.

Sixty-five per cent of the respondents who did not have the reference prior to using the library indicated that they found the needed reference in the available indexes and abstracting services. This is an encouraging report. It demonstrates that if collections of periodical literature were evenly and adequately indexed and if these indexes were up to date, many library users would be quite self-sufficient in their approach to this literature.

Of course, this does not consider the question of whether or not the information needs of these students would have been better met by that bulk of periodical literature, found in every library, which is neither indexed nor abstracted. Yet the evidence shows that efforts to increase and accelerate indexing services are proper and rewarding endeavors.

Only eleven respondents indicated that, at the end of their search for a periodical article, they had found neither the article nor any appreciable information regarding it. This is equal to less than 1 per cent of the total respondents, and indicates a very large number of satisfied users of periodical literature.
Choosing Data Conversion Equipment

Since the automation of libraries requires files of bibliographic data in machine-readable form, librarians responsible for automation activities need to compare the equipment available for data conversion. Keypunch and typewriter keyboards must be considered, as well as devices which encode punched cards, paper tape, and magnetic tape, and on-line terminals. Once suitable machines have been identified, two other major criteria must be considered—price and reliability—though the latter can rarely be predicted accurately.

The goal of the Library of Congress’ MARC Distribution Service is to encompass the entire spectrum of current LC cataloging. Though that goal may not be reached for many years, the promise of centrally captured and distributed bibliographic information in digital form for all current materials is bright. But since one of the academic library’s unique assets is its ability to transcend the present—to control and make available materials without regard for their age—the creation of a machine-readable store of bibliographic information must of necessity accommodate retrospective as well as current information. Despite the likelihood that in the future retrospective cataloging information will also be centrally distributed, many libraries that intend to take advantage of computer technology will become involved in converting their own bibliographic data. Since machine-readable files of bibliographic data are a prerequisite for automated library functions, it is difficult to imagine such a library that will not want to add local elements of information to centrally produced records and local records to centrally produced files.

Given the desire (or need), personnel, and finances to accomplish data conversion, the remaining requirement is for suitable equipment. Though few librarians are likely to become enraptured with the analysis of character sets, transmission rates, and parity checks, it is nevertheless important that librarians responsible for implementing automation realize that their work requires machines that can input a larger number and variety of characters than are used in most computer applications. Therefore they will need at least a passing acquaintance with the various devices that are currently available for the task of converting bibliographic information to digital, or machine-readable, form.

The great majority of conversion devices presently on the market combine some sort of keyboard with an encoding mechanism. This brief survey will first consider types of keyboards, then the various methods of encoding, and finally some of the criteria for choosing among the various types of machines.

The easiest way to classify the several kinds of keyboards that are used on encoding devices today is simply to count their keys, since their number will usually (though not always) provide an in-

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The Council on Library Resources has funded a study, being undertaken at the Library of Congress, to consider conversion of the retrospective records of the Library of Congress to digital form. The stated purpose is to provide data for the entire library community.

Mr. Simmons is Assistant Professor of Librarianship, University of British Columbia.
dication of the number of characters the keyboard can encode. Although smaller devices are in use, the smallest keyboard of interest to librarians is probably the keypunch, which generally has thirty-four keys and can record sixty-four unique codes. It will be recognized, of course, that this number is far too small to encode all of the characters required for bibliographic data. In fact, no fewer than 175 characters are required to represent adequately roman-alphabet languages and romanized forms of non-roman alphabets, even if most scientific and technical signs are spelled out (e.g., “square root” rather than \( \sqrt{ } \)) and certain liberties are taken with some diacritical marks.²

There are several possible ways of dealing with the severe size limitation of the keypunch keyboard. The first method is the most obvious: simply to limit the character set to the ten numbers, twenty-six letters, and twenty-eight symbols of punctuation that appear on the keyboard. The obvious inadequacy of this solution has not prevented its widespread use by librarians as a simple expedient, apparently in the belief that the sacrifice of typographical niceties in exchange for the efficiency of computer-printing is necessary. The production of printed cards, books, and lists using only uppercase letters is the direct result of this technique. Another escape from the 34-key limitation is multi-punching, which consists of pressing a combination of keys to produce a code that no single key can create. This raises the maximum number of characters to the limit of the medium on which the information is encoded. On punched cards, for example, this number is 2¹², or 4,096 unique codes, each of which can represent a character or diacritical mark. The major difficulty with multi-punching is that no useful printed record can be made of the punched character at the time of keying; for example, the characters 4 and Q might be punched together to represent an umlaut, but the characters printed by the conversion device would be merely an unreadable jumble indistinguishable from almost any other combination of characters. Furthermore, multi-punching is generally extremely slow and, because of the lack of visual verification, of unreliable accuracy.

These drawbacks apply similarly to a third possibility—the designation of certain keys as escape codes. In this case one character is interpreted as being a signal that the code which follows represents a character that does not appear on the keyboard. An obvious example would be to precede each capital letter with an asterisk to give the capability of encoding both upper and lower cases, which the standard keypunch keyboard cannot otherwise accommodate. Thus the sacrifice of a single character produces the ability to represent an additional sixty-three characters for a total of 126, and the use of two escape codes permits the encoding of 186 characters.

Although the use of escape codes is a legitimate and commonly used solution to the character set limitation, it can be used even more efficiently in conjunction with a typewriter keyboard. Since the standard typewriter keyboard includes forty-four character keys and two case shifts, it can encode eighty-eight unique characters before requiring an escape. Moreover, most conversion devices with typewriter keyboards also have at least one key that is normally used to create a code not associated with any character. Although these keys are designed to control some aspect of the encoding machine itself, there is usually no reason that they cannot be interpreted as escape codes by the programs that handle the data after it is input to the computer. Thus, with forty-

² For a thorough analysis of the characters required for romanized bibliographic data see Lucia J. Rather, “Special Characters and Diacritical Marks Used in Roman Alphabets,” Library Resources & Technical Services, XII (Summer 1968), 285-95.
four character keys, two cases, and just one escape code, a typewriter keyboard can be used to code 176 unique characters. The additional major advantage of a typewriter keyboard derives from the ease and speed with which experienced typists can be trained to be keyboard operators. When the keying procedures are designed to imitate typing as closely as possible, the training period can be reduced to a few hours; in places where employee turnover is high or there is insufficient work for a full-time operator, this may represent an important consideration.

The two standard types of keyboards—the keypunch and the typewriter—account for the vast majority of keyboard-controlled conversion devices. Other kinds of keyboards, including the ten-key decimal keyboard that can handle only numbers, the twenty-four-key stenotype keyboard that can record over sixteen million unique codes through multipunching, and large keyboards devised for special applications, are certainly available. But most libraries will doubtless find that a standard keyboard, or some variant (such as a keypunch keyboard with upper and lower case capability) will prove suitable when used in combination with one of the several kinds of encoding mechanisms.

Since input devices are modular by nature—the keyboard and the encoding device controlled by the keyboard may be considered separately even though they are usually sold as a single piece of equipment—it is possible to combine any kind of keyboard with any kind of encoding device. Encoders fall into two categories: those which record codes in a medium suitable for temporary storage and subsequent input into a computer, and those which send coded impulses directly to a computer. It is assumed here that computer input is the primary reason for digital conversion and that storage of the encoded medium after input is both unnecessary and undesirable.

Of the various currently available keyboard-controlled conversion devices, the most familiar and still most popular is the punched card, which has been all but synonymous with mechanized information handling since Herman Hollerith patented his eighty-column card in 1889. The major strengths of the card punch result directly from its popularity; new and used machines are readily and inexpensively available, repair service is usually fast (and required infrequently), and card readers form an integral part of the vast majority of computer systems. For the librarian, card punching is usually the most convenient means of converting data, especially where it is possible to take advantage of existing equipment, personnel, and procedures. Even when this is not the case, supplementing the existing resources or locating a service bureau to punch cards at a flat rate is rarely complicated.

However, the limitations of the punched card for bibliographic information, though few, seriously challenge its impressive advantages. Not only are cards inconvenient to handle and store in large numbers, but their fixed length of eighty characters bears no relation to the variable length format of bibliographic data. The result is an awkward group or decklet of cards representing a single bibliographic record. Part of every card must be reserved for a control number indicating the relationship of that card to the other cards in the decklet, to permit sorting into correct sequence should a group of cards be dropped or otherwise scrambled. In order to insert the necessary control codes, the keyboard operator is required constantly to interrupt the flow of data, a process which slows down the keying and promotes inaccuracy. Moreover, even a single typographical error necessitates the correction of the entire eighty-column card on which it appears. Since the punched card is in such common use for a variety of kinds of information, it must
be obvious that these inefficiencies are easily ignored or accommodated, but the fact remains that the fixed length format of the card is basically unsuited to the variable length nature of bibliographic information.

Because it permits the uninterrupted recording of long strings of information without the insertion of special sequence codes, paper tape is theoretically better suited but frequently less satisfactory. The dissatisfaction generally stems from the method for correcting typographical errors made and then discovered by the keyboard operator. Any paper tape typist who has spent an agonized hour (or more) handling yards of punched paper tape searching for a single elusive character, and has then attempted to correct it, has no doubt cast envious glances toward the card puncher, who needs only to find, remove, and repunch a single card. The fact that cards usually contain printed as well as punched characters, while paper tape as a rule contains no guide for human eyes of what the punched code represents, further complicates the handling of paper tape by people. But if the user of paper tape sometimes feels like some machine-age Laocoon, it is most likely because the potential of the computer for manipulating data has not been exploited. There is no reason why error correction cannot be accomplished by computer program after the information has been input rather than by the encoding device. When this is done, procedures can be written to ensure that paper tape need never be handled or searched manually, and from a human point of view the resulting system is generally far more efficient and effective than a punched card input system.³ In such cases an entire day's keyboarding can be stored on a single roll of punched paper tape, a comparatively inexpensive

³To be fair it must be said that a computer program can similarly handle correction codes punched on cards, but this method of error correction is rarely, if ever, used.

and convenient form for temporarily storing data prior to computer input. Now that a variety of paper tape readers, for use both on-line and off, are available and widely used, the punching of paper tape is becoming more widespread among libraries involved in converting bibliographical data.

Yet even as the use of paper tape grows, its logical replacement follows hard on its heels. For almost every kind of device that records information on punched cards or paper tape there is a similar machine, often made by the same manufacturer, that encodes magnetically on recording tape. Some of these tapes can be placed directly onto a computer tape drive—others must first be read through a reader in the manner of punched cards and paper tape; but in any case, magnetic tape encoders possess certain characteristics that make them desirable data conversion devices. Since their only moving parts are the keys and the tape transport medium, they are quieter and more reliable than machines that must employ mechanical punches. Being able to record on magnetic tape, they can also erase and re-record, thus permitting the operator to reverse the tape (commonly by use of the backspace key) to reach a typographical error and retype the erroneous section. This moves error correction from the computer, where errors are most conveniently deleted in paper tape input systems, to the conversion device, thereby simplifying computer programming and reducing computer processing time. Furthermore, since the magnetic tapes encoded by these machines can carry more information (anywhere from twenty to 800 characters per inch) than paper tape or punched cards (which hold ten and nine characters per inch respectively) and are reusable, they are ultimately more convenient and, in terms of raw materials used, less expensive than devices which punch holes in paper or cards. In several currently avail-
Choosing Data Conversion Equipment

able magnetic tape encoders, for example, the information found on over 30,000 printed catalog cards can be recorded on a standard 2,400-foot reel of computer tape, which is then ready for immediate computer processing without requiring the use of an auxiliary converter.

In order to find a more convenient medium than magnetic tape for recording information, one must look at what is, in any case, surely the most logical kind of input device—one which enables the data to be transmitted directly to a computer-controlled storage module: the on-line terminal. This machine is connected directly to a computer either by cable or common carrier (such as a commercial telephone line), enabling the information to travel from the keyboard to the computer without intermediate storage in any tangible medium. Many (though not all) of these devices permit an auxiliary display of the information at the time of input, usually by printing on a typewriter (which most on-line terminals resemble) or on a cathode-ray tube. With the recent introduction of cathode-ray tubes capable of displaying ninety-six different characters and the ability to edit the displayed information with an electronic “light pen,” the use of cathode-ray tube keyboard terminals will no doubt increase in the future as the computer costs associated with on-line equipment drop.

A development which has contributed to the popularity of on-line input has been the marketing of small, special-purpose computers used exclusively for receiving data from terminals and for temporary storage. Such systems, which offer few of the manipulative or computational capabilities normally associated with digital computers, usually consist solely of keyboard terminals, magnetic disks, and a small control unit. As the disks are filled their information is transferred to a larger computer or to another medium more suitable for long-term storage. This independent system thus leaves the larger general-purpose computer free for computation and provides a device dedicated purely to the task of converting large amounts of information to digital form.

Another method of input that is likely to gain favor as the sophistication of the machines grows is known generally as OCR, for “optical character recognition.” There are several kinds of machines that can optically recognize or “scan” characters, and at present their limitations are large. Until recently, character recognition was limited to mark sensing (as used on answer sheets for standard examinations), magnetic ink (seen most often on bank checks), and the optical recognition of the ten arabic numerals—hence the post office ZIP codes. The recognition of alphabetic characters has been and often still is limited to certain type fonts designed specifically for OCR machines, and typewriter manufacturers have been quick to offer one or more of these fonts on their equipment in the expectation that the use of machines to read typed documents would rapidly rise.

These expectations have not been in vain, and the growing use of OCR has resulted in the development of machines that can recognize a variety of typewriter fonts and even hand printing. Though the day when machines can read handwriting, even library handwriting, has not arrived, it is now possible to find equipment capable of automatically converting the information on a typewritten form to machine-readable codes. This permits a single system to be used both for the conversion of existing files of typewritten cards and for inputting current information that is first typed onto a form, then scanned and converted. And without a doubt before many more years pass the machine that can read printed LC cards will be developed. Meanwhile, OCR systems continue to find new users as they develop
flexibility and sophistication. Although they are still extremely expensive to purchase, in many areas they are available for lease at hourly rates that make them competitive with other means of input.

Once a number of suitable conversion devices have been identified, consideration must be given to costs, which have not been listed in this survey both because prices vary among manufacturers and among users, and because price, though important, should never become the prime criterion. The general rule, as one might suspect, is that the more recent and sophisticated devices cost more than the older, simpler ones. But there are significant exceptions. Certain magnetic encoders are less expensive than comparable paper tape punches, and when actual production is measured and analyzed, the cheapest machines sometimes prove unexpectedly expensive. On the other hand, a recent report finds that on-line costs run almost twice those of paper tape, suggesting that while on-line terminals have their uses, input is one of them only for those who can afford the added expense. Computer costs are constantly falling, however, and we soon may be approaching the day when on-line input to a computer will prove as economically advantageous as it is desirable.

The initial cost (that is, the purchase or rental price) of a keyboard device is only part of the total expense. With all methods of conversion other than encoding on computer-compatible magnetic tape and on-line transmission, a device is needed to read information from the encoded medium (cards, tapes, etc.) into the computer. That these machines impose their own technical and financial problems hardly requires stating, though equipment salesmen have been known to neglect to mention the subject. Furthermore, additional costs are often imposed by the need to keep one or more machines available as backup, so that production can continue when one machine requires service.

A third criterion for the evaluation of a conversion device, beyond suitability to the task and cost, is reliability. This aspect is the most difficult to judge accurately, for there are no indicators of reliability other than the manufacturer’s claims, the salesmen’s opinion (these two may not coincide), and the experience of others. While the last of these may appear the most trustworthy, one needs to be sure that the information comes from the best-informed source (a keyboard operator may point out problems her supervisor is unaware of) and that the past experience bears some relation to the proposed use. Many punching devices that are satisfactory when used intermittently several times a day fail completely when subjected to forty hours of use every week. Moreover, a given model of machine will often differ as much from other models made by the same company as it will from the products of other companies. But these warnings of pitfalls and potential hazards should not be a cause of pessimism—only of cautious skepticism. Librarians have never before had such a variety of suitable equipment from which to choose, and the choice grows every year. Cheaper, more sophisticated, and more reliable equipment is constantly being developed. Entirely new techniques of input—as different from today’s methods as optical character recognition is from punching holes in cardboard—are without doubt being designed and developed as this is written. But even when input systems that can accept information as handwriting and as spoken words become as widespread as punched cards are today, librarians who cautiously investigate the various machines available before choosing one will find the expenditure of time amply rewarded.

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4 Alan R. Benenfeld, Generation and Encoding of the Project Intrex Augmented Catalog Data Base (Cambridge, Mass.: Electronic Systems Laboratory, Department of Electrical Engineering, Massachusetts Institute of Technology, 1968).
Book Selection in Academic Libraries: A New Approach

Traditional modes of book selection by instructional faculty working on a part-time basis with limited coordination often result in the growth of imbalanced collections. In an attempt to solve this problem, libraries have begun to utilize bibliographers, who are often assigned responsibility for subjects they cannot adequately cover. By employing systematic methods similar to those developed by bibliographers for surveying and building collections, members of the instructional faculty, by virtue of the added factor of their specialized knowledge, can often be effectively utilized in building collections.

Instructional faculty and librarians have often coexisted uneasily over the years in regard to the building of library resources in institutions of higher learning. In spite of this nervous alliance, many first-rate college and university libraries have been developed in the United States. As academic libraries grow larger and increasingly complex and as the bibliographic materials of each discipline proliferate, however, it appears increasingly that a new approach to the perennial question of faculty-library cooperation in the matter of book selection is needed.

Although there has been recent progress in this area, there are still many instances of faculty selectors working part-time and in a haphazard manner as the primary agents in the development of library collections, a practice involving a number of disadvantages, which can often result in unbalanced growth.

One of these disadvantages is that faculty members, being specialists, sometimes feel that they alone are competent to choose titles in their fields and are reluctant to relinquish this responsibility to librarians whom they regard as less qualified. With such an outlook, they often tend to select the following types of books: (1) those used in preparing their courses; (2) those to be assigned to their students; (3) those with which they were familiar as graduate students; and (4) those which they are using for current research. An instructor's own classroom and research needs in a precisely defined area blurs his vision of the broader picture; it is difficult for such a specialist to see clearly the ramifications of his choices and to perceive the needs of the institution as a whole within the framework of budgetary limitations. In addition, specialization is becoming narrower as the information explosion forces the individual to concentrate on smaller and smaller segments of the available body of knowledge.

Another difficulty is that, even with good intentions, a particularly energetic faculty member who submits many book order requests can fail to see that his...
activity causes the library to grow unevenly, unless all of his fellow book-selectors are equally conscientious. Too often budgetary allocations are based on the volume of requests rather than on the real needs of students and faculty.

There is also the danger of faculty members selecting books in an irresponsible manner. In some cases, book selection has been used as a method of empire building or of wielding power over colleagues; in others, a person without any particular feeling for books or interest in the library has a library assignment imposed upon him. Wishing to find an easy way to discharge his responsibilities, he indiscriminately checks second-hand dealers' catalogs in order to spend departmental funds, while at the same time being jealous of these funds, fearing the loss of any money would elicit criticism from his colleagues.

In addition to the unbalanced development of the collection which can be the result of these disadvantages, there are two further reasons why book selection by part-time faculty may not be the most effective method of building library resources. In the first place, with the rapid growth of libraries, collections have become more complex and the problems of identifying and acquiring library materials more difficult. The development of a library collection therefore requires both greater bibliographic sophistication and more time than could reasonably be expected from a person whose primary responsibility is teaching and research.2

Second, there has been a change in the function of the academic library over the past years. Its traditionally passive, supporting role is being abandoned for a more active part in the educational programs of the campus; it is now less a reserve book room and more a center for independent learning. There is a growing awareness that the needs of individual students cannot always be met adequately in the classroom by the lecture-textbook method of instruction. More and more, students insist that learning be relevant to their individual interests. As a result, experimental colleges, honors and tutorial programs, and comprehensive examinations are increasingly replacing formal classwork.3 The library thus becomes responsible for providing materials for individual study and research which may not parallel the interests of the classroom instructors. Implicit in this responsibility is the need for a broad cultural base in building the collection, a base which can only with luck be provided by a group of faculty specialists functioning separately and with limited coordination.

The crux of the problem seems to be this: as the traditional modes of faculty book selection become decreasingly viable, what alternatives are there? And is there an approach that would be applicable to most institutions of higher learning?

It seems to be generally agreed that the best job of collection building can be done by subject specialists with library training. Since it is seldom possible, however, to have an adequate number of such specialists on a library staff, particularly in the smaller colleges and universities, some libraries utilize bibliographers, each of whom is responsible for the development of a number of areas of the collection. And even though the systematic development of a balanced book collection by bibliographers, who are concerned with the needs of the entire academic community, will have

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2One by-product of rapid expansion can be that immediate and specific faculty needs are automatically taken care of (particularly when there is an attempt at comprehensive coverage of current books), thus causing the instructors' involvement with book selection to become even less useful in the traditional ways. They often become disinterested in the process when this happens.

3It appears that progress in this direction will continue, and it is not impossible to conceive of a functioning library-college where instruction is centered on bibliographic counseling by librarians and former classroom instructors. See Louis Shores, “The True University,” The Library College (Philadelphia: Drexel Press, 1966), p. 39.
better results than haphazard buying done by part-time specialist selectors, the problems facing a generalist bibliographer are enormous.

For one thing, he is usually responsible for a greater number of subject areas than can be covered adequately by one person, and anything beyond superficial evaluation of material is often extremely difficult for him. This problem is exacerbated by the large number of publications which must be surveyed and selected in terms of the goals of the institution.

Furthermore, a generalist bibliographer will lack specialized training in certain areas of his assignment. For example, a person responsible for the humanities might be adequately trained to handle English, American, and Western European literature, but be unqualified in Russian.

Another problem is poor bibliographic control. For some types of material the current output may not be adequately covered; for others, there may be no comprehensive availability or in-print lists. As far as older publications are concerned, selective bibliographies do not exist in all fields; and certainly any bibliography must be carefully reviewed so that the items chosen are appropriate to the needs of a particular institution. Where the bibliographer lacks specialized training, meaningful selectivity is difficult and often arbitrary. Faced with these problems—assignments which are too broad, poor bibliographic control, and lack of specialized training in all areas for which he is responsible—the librarian should consider turning to the instructional faculty for help. This statement may seem contradictory in light of the disadvantages outlined above which were the result of traditional approaches to faculty book selection. The emphasis must now be on new methods whereby teaching faculty and librarians can function together more effectively. It is a question of utilizing the knowledge and training of the instructional faculty without repeating the errors of the past.

Before attempting to describe a specific program, it is first necessary to determine what knowledge and skills the teaching faculty have on the one hand, and librarians have on the other, to contribute to the growth of a well-balanced and useful book collection.

The faculty member, by virtue of his specialized knowledge, should be able to define the nature of the literature used in his research and teaching, that is, what types of book and non-book materials he needs. He should be able to make decisions as to the relative importance of various historical periods and/or specific categories within his subject areas; he may also know the bibliographic peculiarities of the field, such as hard-to-identify publications and the output of learned societies. And finally, in areas lacking good, selective bibliography, he can judge the value of individual titles. The bibliographer should understand the overall needs of the library, possess general knowledge of the literature of each of the fields for which he is responsible, be able to determine which bibliographies would be suitable for developing the collection, be familiar with the special problems of the book trade, see announcements concerning the availability of collections and special materials, and have a comprehensive awareness of current publications. Furthermore, by attending meetings, reading professional journals, and keeping abreast of the book trade, he should be aware of developments in the field of librarianship which can be both relevant to a particular subject area and important to the library as

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4 This is recognized by Voigt and Treyz: "The danger in publishing a selection list of this nature is that it may be used as a final authority rather than as a guide. This list does not claim to be a list of the best books or a basic list for any college library, for selection of books for a college library must be made in terms of the needs of that particular institution." Books for College Libraries (Chicago: American Library Association, 1967), p. v.
a whole. This knowledge should enable
the librarian to translate the information
provided by the faculty specialist
into a workable program of library de-
velopment, which would take into con-
sideration the needs of the entire aca-
demic community.

Moving on to the specifics of such a
program, the first step would be to de-
termine the areas most in need of de-
velopment. There are two factors which
can cause this need: (1) expansion and
(2) weaknesses in the existing collection.

Expansion may be numerical (i.e.,
more students), qualitative (i.e., more
advanced degrees), or the result of new
types of academic programs, such as in-
terdisciplinary or area studies.

Parts of the collection which are not
adequately supporting academic pro-
grams and are in need of development
should, ideally, be identified by a series
of surveys covering the library's entire
holdings. Since, however, such an am-
bitious undertaking is seldom possible,
the bibliographer must often rely on his
own intuitive and informal appraisal of
the collection. This might be based on a
number of factors.

1. Faculty and student reaction. Reac-
tions to the library's holdings in a
given area, if properly evaluated, can
be useful as a first indication of weak-
ness or strength; however, it must be
remembered that they are highly sub-
jective. Library users can have un-
realistic expectations of a collection
in relation to its size, or they can be
satisfied with one that is inadequate,
because they are not aware of the ex-
istence of material which the library
lacks.

2. Quantitative analysis. This type of
evaluation can be made by a simple
count of specific areas of the shelf-
list and can be used, through com-
parisons with institutions having sim-
ilar educational programs, to suggest
imbalance in the collection.

3. Preliminary bibliographic surveys.
These could be based on basic lists,
if such exist in a field, or on random
samples from more detailed lists.
Either type of survey can be useful
as an indicator of imbalance.

Once there is evidence of need, the
bibliographer and other members of the
library staff should meet with the in-
structional faculty concerned with that
particular area of the collection6 for the
following purposes: (1) to describe the
nature of the relevant literature in terms
of stress on current or retrospective pub-
lications, monographs, serials, sets, peri-
odicals, and non-book materials; (2) to
outline existing or projected instruc-
tional programs; (3) to determine, on the ba-
sis of (1) and (2) above, what is need-
ed.

This should define the general direc-
tion of the project. The bibliographer
should then draw up a more detailed
description of it, as well as propose a
method for its implementation. He
should begin by reviewing what has
been written about the literature of the
field and continue by analyzing the exist-
ing bibliographies to see whether they
are appropriate to the needs of the li-
brary.

At this point the bibliographer should
determine whether he can proceed with
the project or if it is necessary to draw
upon the knowledge of a faculty special-
ist. Frequently, even with limited knowl-
edge of a subject, an enumeration of
important authors or sub-fields provides

6 They may come from several departments. For
example, if a project were being done in philosophy,
instructors of art and music might be concerned with
books on aesthetics, mathematicians with symbolic
logic, historians and classicists with Greek and Roman
writings, etc. It should be kept in mind that the library
should not be building a collection for a particular
department; it should; instead, be developing the lit-
erature of a subject area, which could have relevance
to many departments.

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5 For example, he would be aware of reprint pro-
grams, projects such as LC's Presidential Papers, printed
book catalogs, or Books for College Libraries.
him with a sufficient basis for going ahead with the task. If, however, he has no knowledge of the subject, if he lacks competence in a necessary language, if the existing bibliographies are not adequate, or if the literature used by people in the field is dispersed throughout many areas of the collection, and he finds himself unable to proceed, it will be necessary for him to draw upon the knowledge of a specialist.

It is important to select from among the members of the instructional faculty a person who is interested in the library and enthusiastic about such a project. Individuals who are working on or who have recently completed their doctorates are most desirable, since they are likely to be more conversant with the current literature in their fields, to be aware of recent trends, and to have a broader outlook on their field than are those with many years of teaching and research which incline them to specialization.

If a suitable person can be found, it is essential that the individual have time to devote specifically to the project. This can be provided in three ways: (1) he may be given released time by his department; (2) he may have a shared appointment with the library in which the library pays part of his salary; or (3) he may carry out the project as a member of the library staff during the summer months. The faculty member should be assigned to work under the general direction of someone on the library staff, normally a bibliographer, who would already have some knowledge of the problems of the specific field. It should not be assumed that the instructor is already familiar with all facets of the library and with the basic bibliographic tools, so he should be introduced (or re-introduced) to them. He should also meet all members of the library staff, both professional and clerical, with whom he will be working.

Once the general approach has been agreed upon, the instructor and the librarian can begin to compile the various sources from which selection of suitable items is to be made. These sources would include published bibliographies, library catalogs in book form, bibliographies used in courses, footnotes and citations in various monographs and periodical articles, journal reviews, and publishers' catalogs. After suitable materials have been selected by the instructor from these sources, clerical assistants can check them against the library's holdings and prepare order cards. The cards should then be reviewed by the instructor and the librarian to ensure that they follow the guidelines developed for the project and are appropriate to the library.

When the final selection of order cards has been made, the cards should be submitted together with a report of the project written by the librarian. This report should explain the scope, method, and results of the investigation in an organized manner. It may also serve to justify the allocation of additional library funds. More specifically, it should contain the following:

1. a description of an ideal collection as agreed upon by the library and the department;
2. information about the existing holdings gathered from the study;
3. a statement regarding any gaps which will not be covered by the project;
4. a detailed analysis of the types of material to be included in the project;
5. an annotated list of sources used to identify material to be purchased;
6. estimated cost of implementing the survey;
7. recommendations for a buying program in terms of time and procedure.

Although this approach does not differ markedly from one normally taken by a generalist bibliographer, it offers a contrast to the traditional pattern of book selection as practiced on a part-time basis by individual members of the teach-
ing faculty. Instead of sending requests for specific books to the library, with limited concern for the whole collection or even a broad part of it, the teaching faculty can become actively involved in an organized program of collection building, utilizing standard techniques for evaluation which have been developed by librarians. The instructor, and through him his department, acquires familiarity with the library’s holdings and can more clearly understand the need for their systematic development. Thus the “uneasy coexistence” mentioned earlier in this paper can be transformed into a partnership utilizing the skills and strengths of both the teaching and library professions.
Slide Collections in Art Libraries

Most slide collections in academic institutions began as small teaching collections on individual professors' desks and required little if any professional expertise to administer. As they have grown, they have become increasingly complex, but as yet there has been developed no substantial body of professional literature concerning them. The paper describes a project, currently underway, to help remedy that lack.

Traditionally, slide collections in most United States colleges and universities have been initiated by art history faculty to illustrate lectures. These collections were often small, consisting of several boxes of slides relating only to a few specialized subject areas. Because of the size of the collections and the limited demands of the faculty, it was generally assumed that these incipient slide "libraries" required minimal supervision and attention to basic library principles such as cataloging and classification. Generally, part-time students in the department were employed to perform clerical tasks and finally when the collection expanded to burdensome proportions, a full-time person, usually with art history background but almost never with library training, was hired. Needless to say, there were exceptions to this, and in some instances the slide facilities along with a photograph or picture collection were placed under the care of the art librarian. This administrative arrangement was unfortunately less frequently utilized. Although many of the part-time and clerical employees undoubtedly were conscientious, they could be expected to have at best only vague and instinctive notions of facets of library expertise such as classification, cataloging, and circulation which would ultimately be necessary when a collection became large and began to be used by more than a few art historians.

Non-book materials have until recently suffered from professional neglect. More often than not, such collections as slides, photographs, architectural drawings, and maps were begun in a non-library situation by people who had begun gathering materials in a haphazard manner. Almost without exception, such individuals would have no basic library orientation, and it simply did not occur to them to apply techniques which might solve major problems of retrieval which would develop with the expansion of the collection. In the case of slide collections, some actually reached the 100,000 mark before the users recognized and considered the problems engendered by the lack of standardized organizational and management principles such as those used with book materials. At this point, however, even an exhaustive literature search of both library and art historical journals would shed little light on the multifarious and often exotic problems facing the inquirer. The more ambitious slide supervisor would then often turn to the only other source of information by corresponding with the supervisor of one or more of the few major collections in the country who would be able to fur-

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nish guidelines and assistance on specific problems. Individuals such as Miss Helen Chillman of Yale University, Miss Eleanor Collins of the University of Michigan, Mrs. Margaret P. Nolan of the Metropolitan Museum of Art Slide Library, and Miss Phyllis Reinhardt (the author of one of the few enlightening articles on the subject) of Smith College will perhaps testify to the fact that hardly a week goes by without an inquiry regarding slide collection problems. The generosity and patience of these individuals was and is beyond the call of duty; it is clear, however, that consultation by correspondence is not the answer to bringing about the solution for the overwhelming problems facing many of the mushrooming slide collections in the country.

Because of this lack of published information, a comprehensive study and survey of the history of the problem, the present status of slide collections, practical matters (such as equipment and photographic processing), and more formal library considerations (such as use of classification, source files, and authority files) was begun in 1968. The ultimate objective is to produce a comparative study so that slide librarians and curators might have a choice of various systems and procedures currently in practice, that they might have some background knowledge, and finally, that they might have a sense of community with others facing problems similar to theirs. The proposal of an "ideal" system is not the aim of the study, since most users of such a study will be working from already existing collections which have probably grown to such proportions that a complete revision would not be feasible.

The first step in the study was to conduct a thorough literature search of Art Index, Bibliography of Library Economy, Education Index, Library Literature, and the general periodical indexes. This search confirmed the need for a study of both practical and theoretical aspects of slide collecting. The available literature contains no substantive research and tends to be either too narrowly involved with a single aspect of one slide collection or too general in scope. It became clear that a comparative study might have some merit and that a manual of a practical nature as well as a brief history might be useful for someone attempting to deal with a large collection which had grown with little direction over a period of years.

In August 1968 an eight-page questionnaire was sent to over one hundred colleges, universities, and museums. Before the questionnaire could be mailed, however, one of the most serious problems facing this project had to be overcome: the compilation of a mailing list. The American Art Directory, the American Library Directory, and the Directory of Special Libraries and Information Centers were consulted to identify collections. Many institutions, however, were added to the list merely because of personal knowledge and not because they appeared in any of the sources. Lack of such basic information is indicative of the need for definitive and consolidating research in this field.

The content of the questionnaire is fairly broad; it is intended to serve as a basis for a study but not as the study itself. The major categories surveyed are the history of collections; the type of classification system presently used; general operational procedures regarding the purchase and production of slides; the use of library techniques such as a shelflist, authority files, and library tools such as the Anglo-American Cataloging Rules; equipment; and a final section on the educational background of the staff. The broad scope was believed to be useful in a variety of ways. The historical section is intended to bring some perspective of the present condition of collections and the remaining six categories are designed to provide enough data about specific aspects of collections
throughout the country so that a comparative manual may be written. It is hoped that if individuals working with these collections have a readily available source of information, they will be in a better position to examine and improve their collections on the basis of past experience rather than trial and error. Moreover, a directory of participating institutions will more than likely be included at the end of the projected manual so that supplementary correspondence regarding problems discussed in the manual may ensue. This type of list will also provide slide librarians of all backgrounds with a list of institutions which have collections worthy of study and possible emulation.

Lest an entirely dism al picture is left of the present state of slide collections, perhaps it should be noted that there are some very promising trends in the field. One of the most positive of these was the inclusion of an entire session at the College Art Association’s annual meeting (January 1969) devoted to slides and photographs. Dr. Marvin Eisenberg, art history chairman at the University of Michigan and president of the College Art Association, asked the slide librarian in his department, Miss Eleanor Collins, to preside at this special session. Not only does this session indicate that art historians are beginning to recognize that a problem exists in an area upon which they are heavily dependent in their work, but also that slide librarians and curators will be given an opportunity to meet and discuss with their colleagues some of their common problems.

In addition, there is a trend in art departments to consider a basic training in the problems of slide collections as part of a graduate student’s career. A non-credit course is now offered by Miss Collins at the University of Michigan to prepare potential faculty members for what they will face in slide collections and also, perhaps, to encourage some to consider it as a possible career. In a required introduction to graduate study for art history students at Indiana University, lectures were given by the supervisor of slides and photographs to introduce students to the various aspects of slide collecting—both personal and departmental. In all probability there are other similar courses.

The organization and development of a Slide Librarians and Curators Association in California is indicative of the trend toward more communication in this field on a more formal level between supervisors of these collections. This group has been collecting and circulating to its members information on various aspects of slide libraries.

Another trend in this area is an increase in published literature. Examples of this, in addition to the projected comparative manual, are the Metropolitan Museum of Art’s Slide Classification System, and the machine-manipulable slide classification system used and developed at the University of California at Santa Cruz, both to be published by 1969. The extremely complicated nature of many art history slide classification systems makes such publications extremely valuable contributions to the field. In addition, the Metropolitan Museum of Art has published a list of slide sources (commercial and museum) which is available there free.

All of these recent trends tend to underscore the fact that slide collections are finally coming of age in this era of materials explosion. In actuality, many of their problems are shared by all areas of library science, and it is comforting to know that a connection is being established. Any questions regarding the projected manual would be gladly entertained by the present writer. Also, if any reader of this article knows of a collection which should have been included in the survey but did not receive a questionnaire, such information would be greatly appreciated.
BOOK REVIEWS


The purpose of this book, Professor Kister informs us in his preface, is "to train librarians for professional work with the literature of the social sciences" by means of the case study method. On the whole, it is a useful book and goes some distance toward achieving this objective. The thirty cases pose significant library problems in the social sciences as well as related fields such as history and education. The settings include academic, public, and special libraries of various sizes; but most of the problems are pertinent to social science librarianship generally. The questions emphasize bibliographical matters, reflecting the author's very sensible view that "the first requirement for professional [sic] librarians is an understanding of the formal bibliographic system which provides access to the literature and its contents." Kister goes on to argue that bibliographical expertness "becomes the basis for professional judgments regarding the selection, acquisition, organization, and retrieval of the literature." This contention is well demonstrated in the cases, which are complex and involve problems in collection development, reference techniques, public relations, professional and ethical judgments, and that bête noire of librarianship, censorship. The introduction provides a brief but useful appraisal of the nature and development of the social sciences, their literature, and its bibliography.

Much of the book's strength derives from the case study method. By using cases to pose his problems, Kister is able to demonstrate the complexity of library problems, the inapplicability of simple answers, and the importance of evaluation and judgment based on expert knowledge. The situation presented in "Science of Man," for example, requires not simply the development of a basic reading list, but also the evaluation of bibliographical sources, judgments regarding reference practice, and a consideration of the "scientific" nature of the social sciences. "The Balancing Act" calls for an appraisal of reviewing media, a discussion of the merits and possibility of an ideologically balanced collection, and a consideration of the role of the public library. Such an approach is commendable and should help to produce librarians with the breadth and flexibility that today's information problems require. The sample analyses appended to the last case provide a welcome added dimension: a guide to the book's use for both the student and the instructor as well as a demonstration of the amount and variety of thought and effort that the case study method can provoke.

Unfortunately, this method has serious pitfalls as well as advantages, and Kister is not able to overcome them all. Much of the material in this book is characterization or background which has no relevance to the problems posed. At best, it is unnecessary weight or poor amateur fiction; at worst, it conveys "information" which seems most inappropriate—stereotypes of old maid librarians, bumbling scholars, callow young librarians, and ludicrous interpersonal situations which present a vision of libraries and librarians that is trivial, embarrassing, and quite at odds with the serious and sophisticated approach that pervades the book's problems and introduction. Anyone assigning this book to library school students should recognize these shortcomings and their implications. However, if used as its author suggests, to complement other materials and teaching methods, Social Issues and Library Problems should prove an asset to courses in social science bibliography.—Eldred Smith, University of California at Berkeley.


Perhaps the most refreshing thing about
these volumes is that Dr. Lowell has expanded the concept of management far beyond the building of budgets and plotting of work flows to include the importance of people in all of these efforts, and has therefore produced three excellent works which will be of great value to all students of librarianship.

The set comprises three volumes, each with a different purpose and subtitle. Volume I, entitled "The Case Method in Teaching Library Management," begins with a short introduction discussing the concept—or concepts—of "management," its definition by various authorities in the past, and its relation to librarianship, and then proceeds to chapters discussing the case method as a teaching technique, its history and development, and the types and kinds of cases that can be isolated. The following chapters on using the case method in class and the techniques for gathering data and writing cases are very good. The final chapter contains five library "in-basket cases" which we are told will be "useful in evaluating a student's or a participant's potential in coping with the administrative aspects of a managerial situation . . . (etc.)." They are nice cases, but I am not quite sure why they are here except to make the book 168 pages long instead of 99. An appended bibliography of A-V aids for teaching management completes the book.

Since Volume I deals with the essentials of a rather dry subject, namely how to teach management, it tends to be dry. It is to Dr. Lowell's credit that she has made it thorough, scholarly, and yet not totally unreadable. Little gems like: "An ingredient of maturing in a profession is the haunting trepidation about one's own adequacy to assume a more responsible leadership role" come over you with the suddenness of Tom Lehrer's "sliding down the razor blade of life," and suggestions like the development of a body of library management principles from the raw data of collected cases point nicely toward areas for research.

To me, however, Volumes II and III are the real prizes, perhaps because the enigmas of library administration have filled my waking (and some sleeping) moments for many years. In the course of this time I have read many so-called "case studies" of administrative problems and have found a large proportion of them dull, implausible, or ridiculous, attempting perhaps to elucidate a principle by offering the situation in the extreme, but often making librarians seem to be fanatics or simple-headed nineties—of which, of course, like any profession, we have some but not, I submit, the number implied by these cases. Dr. Lowell admonishes us not to "forget that most library employees are dedicated and efficient," though of necessity they play problem roles in these cases. The admonition is well taken but, more than anywhere else I have read, the cases here "tell it like it is" and present the fairest picture I know of people, places, and situations in the library world.

Both volumes (II and III) are really combinations of textbook and syllabus, containing lecture notes, lists of reading assignments, bibliographies, and texts of case histories.

Volume II, subtitled "The Process of Managing," presents the history and development of management and its application to library situations in lecture outline form, and over 300 pages of cases studies on various well-chosen segments of library administration.

In Volume II personnel problems are ingeniously avoided, so that Volume III, subtitled "Personnel Management," may deal in a similar fashion with employees and their cares. Again the cases are grouped by type of problem, such as "Recruitment, Selection, and Employee Appraisal," "Discipline, Grievances, and Justice," and so forth.

In the past I have questioned most seriously the content of "administration" courses simply because I do not believe the student has the background to appreciate the problems. Here Dr. Lowell has carefully developed the background with the problem, and has, one is tempted to say, reduced the essence of libraries (which are mostly people, not books) to clear and graphic forms. I would hope that many library school students will have the opportunity, through these cases, to learn more of what libraries are all about.—Gustave A. Harrer, University of Florida.

In this adaptation of his doctoral dissertation Mr. Bobinski treats in factual detail the history of Carnegie public library philanthropy in the United States. His comprehensive study of the expenditure of more than $40,000,000 for the erection of 1,679 public library buildings in 1,412 communities, covering all aspects of the subject, including a survey of 225 communities which had Carnegie grants available and did not use them, is both detailed and yet easy-to-read and charming. Perhaps the only faults one might find with it are in the relatively short six-page "personal appraisal of Carnegie's philanthropy" and, in light of the emerging social consciousness of librarians, in his dismissal of the lack of influence that Carnegie exerted on the provision of integrated library service for Negroes in the South and of the question that was raised in some communities of the source of Carnegie's wealth. His comment is that, "It seems unnecessary now to consider the question of how Carnegie made his money and whether it was morally right for communities to accept it as library philanthropy. Andrew Carnegie was no worse, and perhaps even better, than the other capitalists and industrial leaders of his time in respect to wages and working conditions" (p. 186-7). More personal comments and evaluation on a number of the matters dealt with, especially on these two matters of social significance, would have added a great deal to the book.

There is little in this book of specific interest to the academic or research librarian. Apart from a paragraph on a few joint use facilities, such as that provided for Cornell College and the community of Mount Vernon, Iowa, academic libraries are entirely outside the scope of this book; and as Carnegie's aim was to improve popular access to books, his grants to large city libraries, such as the New York Public Library, to which he gave over $5,000,000 in 1899 to build sixty-six branch libraries, were generally to provide for branches and other facilities to be used by the general public rather than to provide for research facilities. Carnegie's philanthropy did have an impact on academic libraries. Primarily in the period between 1902 and 1908 some $4,283,048 was given toward the construction of 108 academic libraries; and, while Bobinski stresses the fact that grants were not made to public libraries for collections, 311 academic libraries, mainly in the 1930s, did receive grants totaling $2,592,800 for library development which, in general, meant the purchase of books. Hopefully, someone will devote the same care and effort to that aspect of Carnegie philanthropy as Mr. Bobinski has to the public library aspect, for that story is as important and worthy of study and could well result in as pleasant and readable a book as this one. —Norman D. Stevens, University of Connecticut.


Professor Morse has attempted the most difficult task of bridging the gaps between the librarian, the systems analyst, and the operations researcher. The latter two in some areas are considered to be synonymous. His book, divided into two categories (namely, the theoretical models and the application of theory), is well organized and provides an introduction to the theory before it is discussed and applied to the libraries at the Massachusetts Institute of Technology. It would appear from the standpoint of reviewer, however, that to comprehend the material fully the reader should have at least one semester of probability theory. The librarian with little or no mathematical background will have considerable difficulty comprehending the models, although the trained systems analyst and the operations researcher will comprehend them with little or no difficulty. It would seem that the book is more readily suited to the systems analyst and the operations researcher who currently are working in library systems analysis. The book is of value to the librarian only to the
extent that it exposes him to the kinds of analyses that are possible when one applies the techniques of operations research and systems analysis to a library system. Such applications are long overdue, and the potential results should improve the effectiveness of libraries severalfold.

This book could be used as a beginning text in a course in library science in the area of library systems analysis. However, additional material would be needed to supplement it and to describe some of the other studies that have been done in libraries. A reviewer probably should make some critical comments even about a good book, and therefore my only comment would be that more material could have been included about other studies and models. For example, there are possible applications of non-linear programming to such inventory areas as journal and serial purchasing and selection. However, this is the kind of criticism that can be made of almost any book, namely, that it could have been more comprehensive.

An overall evaluation finds the book to be an excellent contribution to the field of library science which will undoubtedly help to bring more science back into the field of library science. —Richard W. Trueswell, University of Massachusetts.


Slowly, painstakingly, methodically, we are covering the nation. Someday the good work begun by Roorbach and Kelly, continued by the American Imprints Inventory, and advanced by the intrepid McMurtrie, will be complete, and thereafter we will know with ninety-nine per cent certainty the work of the early printers and publishers who peopled this nation’s moving frontiers.

George N. Belknap’s Oregon Imprints is the latest in a long series of volumes recording the early publications of the respective states, and it is a good one. Imprintophiles will relish the compiler’s account of his own seduction:

About a year before Douglas McMurtrie’s death in September 1944, the manuscript of his Oregon Imprints 1847–1870 was accepted for publication by the University of Oregon. As University Editor, I had expected that my part in the making of the book would be merely the routine checking of copy. But I did not know McMurtrie. Questions on some minor details sent me to the University of Oregon Library. A report to Chicago of two or three small errors in descriptions—probably with a transparent note of editor’s one-upmanship—brought flattering thanks for my diligence and sent me back to the Library for further checking. And then I found an imprint “not in McMurtrie” and another, which, after an exciting exchange of letters, went into the manuscript. Now I was hooked . . .

Sound familiar?

During the subsequent fifteen years the compiler added 967 imprints to McMurtrie’s original 589 and deleted thirty-five for a final total of 1,521 entries. His discoveries pushed the earliest known printing in the state back two years to 1845. The resulting volume will stand for a long time as the definitive enumeration of early Oregon printing, although one can imagine that somewhere the game has probably already begun of reporting a title “not in Belknap.”

The introduction to this work records the adventures and trials of the compiler rather than the standard historical essay on the first printing in the state. The illustrations are well selected, clearly reproduced, and keyed to the text. The appendix comprises a list of 142 lost Oregon imprints. The indexes, both of subjects and of printers and publishers, are comprehensive and accurate.

Bibliographical description of the 1,521 entries is appropriately full, including main entry, title page transcription including line endings, printers’ devices, pagination and size, frequent descriptive and historical as well as contents notes, and locations of copies. It is done in the best bibliographical and scholarly tradition and represents an important advance in our growing knowledge of our printing history. The volume is well designed and handsomely printed. May there be more! —David Kaser, Cornell University.
ABSTRACTS


The conclusion of the survey is that North Carolina libraries do not have sufficient resources, physical facilities, or staff to provide adequate library service for the state. The survey covers the present and potential roles of the State Library, the State Department of Archives and History, public libraries, university libraries, senior and junior college libraries, technical institutes and industrial education centers, school libraries, special libraries, and library education. The proposed program of the Governor's Commission on Library Resources for improving library services covers the areas of financing, personnel, and facilities. Appended are: A) Standards for Library Functions at the State Level, B) Archive and Manuscript Collections in North Carolina, C) Rules and Regulations for the Allocation of State Aid and Federal Aid to Public Libraries, 1964-65, D) Education for Librarianship in North Carolina, and E) Extending the Carolina Cooperation.


The purpose of the conference was to investigate the implications of new technologies for library architecture and to use the findings in planning a new Library Research Facility for the Harvard Graduate School of Education. The first half of this document consists of reports prepared by six consultants on such topics as microforms, computers, facsimile transmission, teaching machines, audiovisual media, automation, library equipment, man-machine systems, and copying methods. The second half of the document is the transcript of the discussions at the conference.


The Training Program consists of three specialized courses in medical librarianship, a four-week orientation to medical librarianship, field trips, and a seminar series on related topics. Resources of the local medical and academic communities have been used and an internship program for librarians in the two Veterans Administration hospitals in the Cleveland area was established. Recruiting activities for the program including mailed announcements, descriptive brochures and posters, and a rented booth at the Medical Library Association's 1967 Annual Convention are also described in this report.

Results of an Experimental Program to Provide Low Cost Computer Searches of the NASA Information File to University Graduate Students in the Southeast. Final Report. By Frederick O. Smetana and Dennis M. Phillips. Durham: North
In an effort to increase dissemination of scientific and technological information, a program was undertaken whereby graduate students in science and engineering could request a computer-produced bibliography and/or abstracts of documents identified by the computer. The principal resource was the National Aeronautics and Space Administration (NASA) tape file which is the basis of "Scientific and Technical Aerospace Reports" (STAR) and "International Aerospace Abstracts" (IAA). The search systems used are described, pricing considerations are discussed, and detailed statistics of the operational functions are presented. Results are given on a user survey, with 144 responses obtained from the 155 students for whom searches were run. In general, the students appeared satisfied. As the primary objective of the Technology Utilization Program is the more rapid diffusion of new technology into commercial industry, it was considered unfortunate that fewer than 40 per cent of the respondents indicated an interest in entering business and industry. It is suggested that some means be found to present significant data in simple terms to undergraduate students expecting to enter commerce, finance, and manufacturing in order to familiarize them with a source from which they may obtain such information in the future.

Ten Steps for the Establishment of the Comprehensive Community College Library. By Norman E. Tanis. Pittsburg: Kansas State College, 1967. 12 p. (ED 027 044, MF—$0.25 HC—$0.70.)

Because community college boards of trustees and citizens committees often make the initial decisions about major college policies and building plans, it is important that they become aware of the basic sequence of events which will promote excellent community college libraries. The ten steps involve: (1) provision of funds for the library in the capital funds secured for the new campus, (2) appointment of a capable head librarian, (3) utilization of a well-qualified library consultant, (4) establishment of a code of library policy and procedure, (5) priority to be given for provision of library materials, (6) considering the library to be a materials resource center, (7) long-range budgeting, (8) visits to similar libraries, (9) writing the specifications for the consultant, and (10) establishing cooperative relationships with other libraries.


The report examines patron characteristics and use patterns of the New York Public Library Research Libraries. A general user survey was conducted as well as surveys of the use of the Photographic Service, Special Collections, Special Study Areas, and Reference Correspondence Service. Chapter I is a summary of principal findings and conclusions. Chapter II covers the status, academic affiliation, occupational fields, educational level, and place of residence and employment of the patrons. Chapter III discusses the use of the Research Libraries including divisions used, frequency and intensity of use, purpose of visits to the Research Libraries, materials sought and used, libraries used previously, and usefulness of resources. Chapter IV covers the effects of patron characteristics on the use of the Research Libraries. Projections for future use are given in Chapter V. The appendices include extensive descriptions of the five surveys, copies of the user questionnaires, and a study of seasonal variations in use.
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With each passing year, the professional meeting is assuming greater importance within the international scientific-medical-technological community. It permits instant communication of new data—formal publication often lags a year or more. It denotes the state of the art, the "now" in the time-line of work in progress. And perhaps most valuable of all, it provides opportunity for face-to-face communication, for the cross-fertilization of theories and concepts.

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You will further learn that attendance is expected to be 400 to 500, and that the meeting will include some 90 exhibits. Should you be interested in presenting an exhibit of your own, Dr. Ribera is the man to write to.

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