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Library Trends

Availability of Library Research Materials

DOROTHY M. CROSBLAND
and
WILLIAM PORTER KELLAM, Issue Editors

April, 1954
Library Trends

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Library Trends, a quarterly journal in librarianship, provides a medium for evaluative recapitulation of current thought and practice, searching for those ideas and procedures which hold the greatest potentialities for the future.

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# Library Trends

**VOLUME 2 • NUMBER 4**

**APRIL, 1954**

**Availability of Library Research Materials**

DOROTHY M. CROSLAND  
and  
WILLIAM PORTER KELLAM, *Issue Editors*

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Introduction

DOROTHY M. CROSLAND and
WILLIAM PORTER KELLAM

One of the most pressing problems of our time is the maintenance of command over the ever-swelling flood of informational materials, many in new media, that threatens to inundate the scholar, research worker, student, and the library. The mass of printed matter alone is so vast that a complete inventory has not been achieved by any country.

Each year, hundreds of millions of dollars are spent by government agencies, industries, universities, and other organizations for research in science, technology, the social sciences, and humanities. The results of that huge program of experimentation and investigation appear in a variety of forms: in tens of thousands of articles in scientific and technical journals, in thousands of research reports of restricted circulation, in microfilm, microcard, and microprint series, in books and pamphlets commercially and privately printed, in near-print publications, in tape recordings, in motion pictures. The rate of production is steadily accelerating, and each year research becomes more specialized.

The volume of informational materials is increasing faster than our ability to deal with it. As a result the dangers are clearly present of overlapping and duplicating research, of failure to have available pertinent records at critical times, and of serious waste of funds and of expert manpower. It is quite within the realm of possibility that our natural survival could depend on thorough and effective organization of essential knowledge.

The extent of the problem may be estimated from statistics of publication in chemistry alone. In 1951 Chemical Abstracts published 50,657 abstracts of periodical articles and announced the publication of 1,959 new books of chemical interest. Obviously, no one busy

Mrs. Crosland is Director of the Georgia Institute of Technology Library. Mr. Kellam is Director of the University of Georgia Libraries.
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chemist could read and digest more than a fraction of this production or even be able to examine the titles relating most specifically to his area of specialization. The more general references were likely to be read only in abstract form, or not at all.

Research, especially in science and technology, advances swiftly, and its literature may become obsolete or obsolescent in a period of a few months. Consequently, to be of maximum value, abstracting, indexing, or other finding aids must be provided with the utmost expedition. The tools of access are almost as important as the materials themselves, for without guides one would be hopelessly lost, and any potential gold would remain buried from sight.

The stage for this series of papers on the availability of library research materials is set by Alan T. Waterman in his article “Research and the Scholar.” As Director of the National Science Foundation, Mr. Waterman sees the problem of controlling the flood of research materials particularly from the point of view of the scientist, but he is also well aware of its implications for scholarship as a whole. His informed and thoughtful comments provide a background for the more specific expositions which follow.

Robert B. Downs draws upon a rich background of experience and accomplishment for his paper “Problems of Bibliographical Control.” Believing that effective national bibliographic organization must precede universal coverage, he points up the problem by treating some of the dilemmas confronting us in trying to achieve complete national bibliography for one country, the United States. He considers the systematic acquisition of foreign materials by libraries, the location of materials through union catalogs, union lists and other devices, and the provision of subject bibliography. On the whole, Mr. Downs’s conclusions are more optimistic than might have been anticipated, but he leaves no doubt that much remains to be accomplished before we can claim the mastery over the mass of written and published materials implied by the term “bibliographical control.”

As one writer commented recently, “The bibliography of serials contents is of a magnitude to dwarf the problem of monograph bibliography.” In certain fields, periodical production far outweighs book production, and the journals are from one to five years ahead of the books in up-to-dateness. In every area, except perhaps the humanities and some of the social sciences, research workers rank the journals first in importance and value. This is the source of insistent demands for adequate indexing and abstracting services. This is the topic dealt with by Verner W. Clapp in his paper “Indexing and Abstracting
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Services for Serial Literature." Mr. Clapp is the compiler of an authoritative work relating in part to this matter, Bibliographical Services, Their Present State and Possibilities of Improvement, Report Prepared as a Working Paper for an International Conference on Bibliography, sponsored by Unesco and the Library of Congress in 1950, and he has been actively interested in the problem for a number of years. He traces the history of periodical indexes as a background to a consideration of the current status of indexing. Present indexing services, he shows, are less than satisfactory because of duplication, inadequate coverage in some fields, multiplicity of services, and high cost.

Since Vannevar Bush in 1945 stated his revolutionary concept of the Memex, for storing on microfilm and making instantly available millions of records, librarians, bibliographers, and scientists have been taking a new look at the subject of bibliographical control. The leader in practical realization of Bush's theoretical proposal is Ralph R. Shaw, a pioneer in the advocacy of machines for improving library routines. In 1949, he developed, under the sponsorship of the U.S. Department of Commerce's Office of Technical Services, a new "electronic brain," known as the "Rapid Selector." The machine, which has since been undergoing further refinements, holds great potentialities for bibliographical purposes.

Mr. Shaw outlines the nine basic processes which form the parts of any bibliographic system and the operations involved in each, and then considers "the possibilities for mechanization of each of the operations, the mechanical and electronic devices available or foreseeable, and the operations and levels of operation at which these are, or may be, applicable." The conclusion is reached that although numerous sophisticated devices offer promise in the area of bibliographical work, the indications are that there will be no widespread adoption of them by libraries in the near future.

A pioneer in another, but related, activity is Herman H. Fussler, who has been directly involved with questions of microreproduction of library materials for much of his professional career. When Mr. Fussler became head of the Department of Photographic Reproduction at the University of Chicago in 1936, microfilming was in its infancy, and he has been responsible for some of the principal technical advances, as well as for the application of microfilm to several large projects. His book Photographic Reproduction for Libraries is still a standard work in its field. Mr. Fussler, concerned with progress and prospects in methods of reproducing research materials by photographic means, reviews the techniques presently available or in the
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process of being developed, and examines the comparative advantages and disadvantages of these various procedures. In this area, too, changes are rapid, and we can expect continued improvement in existing processes, and the appearance of new devices in the future.

Nonavailability of research materials may be caused by institutional and governmental rules and regulations. In libraries, restrictions are most likely to affect manuscripts and rare books, and may take such forms as limiting use to specified individuals and refusal to permit copying or publication. Governmental restrictions are most likely to be applied to materials for security reasons, and we find thousands of research reports in classified and confidential categories. Similar rules often govern reports prepared by business and industrial organizations. A minor restriction becoming more prevalent in libraries is the practice of charging a fee for the use of materials. Louis R. Wilson's and Jack Dalton's contribution considers several types of materials to which restrictive measures are applied in more or less degree.

Probably no other librarian in the United States or elsewhere has devoted more exhaustive study to the spatial problems of libraries than has Keyes D. Metcalf of Harvard University. As head of the world's largest university library, he has had to be constantly aware of space requirements for millions of books, hundreds of readers, and all the demands made by the steady growth of a great library. He inspired and was one of the founders of the New England Deposit Library, a pioneer attempt to provide centralized, cooperative, and economical storage for little-used books.

Mr. Metcalf provides a broad review of the factors governing spatial matters in the library building. While emphasizing the financial aspects, he considers the various types of buildings, the allotment and utilization of space to various library functions, equipment, cooperative acquisition and storage of materials, applications of microreproduction to the problem, and other phases of the question as they may affect both cost and availability of materials.

Acquisition activities of libraries are treated only incidentally in these papers, though the subject is, of course, basic to the theme of availability. Exchange of publications of a scholarly and research nature among universities, scientific societies, and other learned organizations has long been a major means of distribution. National and international exchanges are covered by Edwin E. Williams, author of several articles on the subject of exchanges as well as the Conference on International Cultural, Educational and Scientific Exchanges, the most comprehensive treatment of the subject to date.
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Free lending of research materials between libraries is another effective, though limited, means of distribution. Carl H. Melinat after giving a short historical background, has surveyed current practices and trends in interlibrary loans. Again, this is a subject principally of concern to the scholar and research worker, since materials loaned are usually highly specialized and limited in availability. The growth of microphotography and the more recent application of mechanical transmission devices to library purposes are causing gradual changes in the nature of interlibrary loans, but none of the technical developments are likely to supersede them completely.

The impression given by this series of articles is that the matter of making research materials more readily accessible to users is a primary concern of librarians, bibliographers, scientists, and publishers, and it is apparent from these papers that the problem is being attacked on many fronts. With so many minds engaged in seeking a solution, and with the progress already achieved, there are excellent reasons for believing that ultimately the dilemma caused by the increase of recorded knowledge at a more rapid rate than it can be organized and absorbed is on the way to being resolved.

These papers, with the exception of those by Melinat and Williams, were first presented in a symposium at the joint dedication of the new library buildings at the University of Georgia and the Georgia Institute of Technology, November 19–21, 1953.
Research and the Scholar

ALAN T. WATERMAN

In the sciences particularly, the development of new knowledge has in the last half century far outstripped the rate of development for all of the preceding centuries. For some time now we have been faced with the problem of whether even our most modern devices are adequate for the dissemination of the information that is being developed. The situation is immeasurably complicated by the fact that the book is no longer the primary medium for the introduction of new scientific discoveries. It has been succeeded in this role by the scientific journal, and the number of these journals has now multiplied to the point where no one knows exactly how many there are in the world and what they are.

In an effort to provide this information, the National Science Foundation is supporting a project at the Library of Congress for the compilation of data on scientific journals, with emphasis initially on those published in the United States and Russia. It is hoped that this project can be expanded to provide eventually a card file of descriptive data on scientific journals that can be kept up to date and used for the preparation of comprehensive or specialized lists of journals. The journal question carries with it the related problems of abstracting and indexing, without which much information would be "lost."

One rather sweeping innovation is the issuance of separates in lieu of complete journals. The American Society of Civil Engineers has, in fact, abandoned publication of its proceedings in full and is issuing its papers as separates. Each member is entitled to receive forty papers without charge and selects, by subject categories, those in which he is interested. This trend will be interesting to watch.

Have we not reached a new crisis in the history of learning that calls for a revolution in method as far-reaching and as radical as the invention of paper and the printing press?

Obviously the capacity of the printing presses far outstrips our

The author is Director of the National Science Foundation.
ability to handle the output efficiently. In the sciences, the situation is crucial, particularly at the present time when so much depends upon the efficient utilization of the scientific skills we possess. We are acutely aware that we are not producing scientists fast enough to meet all the needs of teaching, of research, of industry, and especially to meet the urgent needs of national defense. How important it is that time should not be wasted in the unwitting duplication of effort.

Perhaps if there were a more vigorous expression of demand on the part of the scientist, greater effort would be expended on solutions to the literature problem. One suspects that scientists, as well as scholars in other fields, are inclined to be traditionalists as far as their working habits are concerned. Many scientists feel, for example, that they and their colleagues are fully abreast of every important development in their fields. This awareness is based on knowledge of published literature and close contact with other leaders in the field. Such methods are becoming increasingly inadequate, however. Furthermore, even if it were possible for scientists to keep abreast of all that is going on in their own fields, it is obviously impossible for them to keep up with other fields, even those closely related to their own.

The literature system that we all know and use grew up around the individual disciplines and is oriented primarily toward Western science. Today, however, the old barriers between the disciplines are gradually breaking down; it is becoming more and more important for a man to know what is going on in other fields, and consequently the old single discipline system of literature is inadequate to his needs. In similar fashion we are learning that it is no longer enough to be informed merely on what is significant in countries of the West. Several of the Asiatic nations are making rapid strides in science, and we certainly cannot afford to ignore these developments on the other side of the world.

A few scientists who have become actively interested in the literature problem are trying to interest other scientists by demonstrating how much information on the state of the art, in a given subject, eludes even the most assiduous investigator. Maurice B. Visscher, Professor of Physiology at the University of Minnesota Medical School, stressed this point before the Conference on International Aspects of Librarianship last August. Drawing upon his own experience, he said:

At the present time with one of my colleagues I am preparing a critical review of the literature on a very small physiological topic, pulmonary edema. We have identified in three months about fifteen hundred relevant references and are in the process of scanning the
papers and studying those which appear to us to be important. There have been a dozen fragmentary reviews of this topic in the last decade, but we find that some of the most important papers are not mentioned. And especially, we have found that many of the more important contributions are not abstracted or indexed under headings identifying them as being relevant.

I mention this personal experience primarily to stress the point that much scientific information is at present buried in the libraries of the very institutions in which people are as busy as bees repeating the same studies and spending precious years rediscovering established facts. Even more deplorable is the failure to take the established facts into account in planning studies on facets of problems indirectly related to them. For this reason the new studies are not as well oriented as they could be.¹

Visscher also took note of the increasing problem of languages, noting that scientific literature tends to appear in more, rather than fewer, languages. He cited a number of examples of wasted effort brought about through an ignorance of results published in other languages. He noted that between 1947 and 1952 scientists in the United States spent hundreds of thousands of dollars repeating work on stereovectorelectrocardiography which had been done in Japan and published in Chinese in 1939. He also reported that the Russians had published, in the early thirties, an account of the first demonstration that stored blood could be used safely for transfusion purposes. This work did not come to the attention of western European and American students of the problem until some years later.

The fact that Russian now stands near the head of the list of languages of greatest frequency in scientific publications has prompted the National Science Foundation to explore the problem of making Russian scientific literature more generally available. As an experimental effort, the Foundation is supporting the translation of a number of significant Russian scientific papers. These are being published through cooperative arrangements with the U.S. Atomic Energy Commission and are being distributed to certain government agencies and to forty depository libraries. Remaining copies are offered for public sale by the Office of Technical Services.

The problem of languages can be met on a long-term basis only by stiffer language requirements for science students. At the Fourth National Conference of the U.S. National Commission for Unesco, held in Minneapolis in September 1953, American neglect of foreign languages was repeatedly criticized. Now that our interest and our
Research and the Scholar

Responsibilities are global in scope, surely it is more than ever incumbent upon us to develop skills in languages other than our own.

The literature problem as a whole can only be solved by concentrated and imaginative research efforts. Although the National Science Foundation is eager to encourage, and even to support, research along these lines, few proposals have been received that suggest any new approach. It is rather strange that this should be so, for the history of science is filled with examples of the invention of new tools and instruments for research, which scientists have devised to further their work in the laboratory. One could mention, among many such examples, the centrifuge, the oscilloscope, and the electron microscope. Even radar, which was developed for specific wartime applications, made possible the creation of very short electromagnetic rays, which have led to basic new discoveries regarding the nature of the nucleus.

Science has also successfully developed some exciting new tools for scholars in other fields. Several years ago, Willard F. Libby and his co-workers at the University of Chicago demonstrated the feasibility of using the carbon-14 content of carbonaceous materials to determine the age of such samples. Since then, radiocarbon-dating has developed into a powerful research tool of value to the anthropologist, archaeologist, biologist, geologist, and chemist. The National Science Foundation is currently supporting a new project in radiocarbon-dating at the University of Colorado, which plans to develop a cooperative program through which valuable service can be rendered to institutions in adjoining states.

Is it not time, then, that science seriously attacks the overwhelming literature problem before it engulfs us completely? Obviously any successful solution in the field of scientific literature would be likely to produce beneficial results in other fields as well.

The availability and use of research material is a matter of fundamental concern, for it is by these means that we hand down not only our culture and our accumulated knowledge but our precious traditions of freedom. Throughout the long and troubled history of mankind, those who have sought to suppress men's freedom have sought to cut them off from the written word. Ernest Cushing Richardson has pointed out that in ancient times books were kept from the common people because the written words gave superhuman power. A careless librarian might lose his life "because he incautiously and contrary to the rules loaned out a book of magic to the wrong persons." The Encyclopaedia Britannica notes that "The quality of printing began to deteriorate in the 16th century, owing somewhat to
ALAN T. WATERMAN

the fact that the ruling powers in church and State became alarmed because the new art seemed to be creating too much freedom of thought. Measures of repression were adopted and printing ceased to be an art and became merely a vehicle for the conveyance of information.3

Many early scientists were accustomed to state their findings in the form of anagrams or codes not readily intelligible to other people. Thus the seventeenth-century physicist, Robert Hooke, tells us that he printed his theory of springs "in an anagram at the end of my book of the descriptions of helioscopes, viz. c e i i i n o s s s t t u u, id est, ut tensio sic vis; that is, the power of any spring is in the same proportion with the tension thereof:"4 Such devices served a two-fold purpose: they helped to establish the priority of an idea, and they afforded a measure of personal security for the scientist, who was liable to be charged with witchcraft or necromancy if his theories were widely known.

Throughout history, also, libraries have been a principal target for invaders. The library of Christ Church, Canterbury, was destroyed by the Danes in the ninth century, and the earliest and most famous library of Italy, that attached to the Abbey of Monte Cassino, was fired by the Saracens, also in the ninth century. All wars have produced this type of vandalism against centers of culture and learning.

Today, as in other troubled times, universities and the libraries have an important part to play in the preservation and perpetuation of our liberties. Numbers and size are not always significant. According to some authorities, the largest library in the world, with the largest number of daily readers, is the State Library in Leningrad. The World of Learning reports that in 1951 there were some 300,000 libraries throughout the U.S.S.R. Obviously, libraries must be something more than the physical collections of books, periodicals, and manuscripts. In a free country they must jealously stand guard over man's right to read what he will, to think, and to make up his own mind. There is today a very real threat to intellectualism of all kinds. Our schools and our libraries are the refuge and guarantors of intellectual freedom and at such times they are subject to attack, as the citadels of learning have been throughout history. For our own sakes, and for the sake of our children, they must continue firmly to withstand assaults upon the independence of the mind and spirit. In the words of President Eisenhower:

The libraries of America are and must ever remain the homes of free, inquiring minds. To them, our citizens—of all ages and races, of all
creeds and political persuasions—must ever be able to turn with clear confidence that there they can freely seek the whole truth, unwarped by fashion and uncompromised by expediency. For in such whole and healthy knowledge alone are to be found and understood those majestic truths of man’s nature and destiny that prove, to each succeeding generation, the validity of freedom.¹

References

5. Letter from the President to R. B. Downs, President of the American Library Association, June 26, 1953.
Problems of Bibliographical Control

ROBERT B. DOWNS

When viewed from all directions, bibliographical control is a subject of monumental proportions. In its broadest sense, perfect bibliographical control would mean a complete record of the existence and location of every book and of all other materials of concern to libraries. It is doubtful that we shall ever reach such a utopia.

The problem of bibliographical control is as ancient as the beginning of writing. Catalogs of cuneiform tablets, for example, were found among the ancient Babylonians, and lists of papyri among the Egyptians. In the case of the Greeks, as Geoffrey Woledge points out, Aristotle recognized the importance of knowing what had already been written on a subject. "He starts off his Metaphysics with a history of the philosophers who had gone before him—the first critical bibliography, we might call it." His pupils followed his lead in other fields of science.

As we proceed on down through the Middle Ages to the Renaissance, the number of bibliographical compilations grows. With the invention of typography in the fifteenth century, the troubles of bibliographers were vastly increased. Subsequent developments, such as high-speed printing presses and wood-pulp paper, have resulted in the situation getting rather thoroughly out of control.

Back in the seventeenth century, in the days of Francis Bacon and John Milton, scholars took all knowledge to be their province. It was generally taken for granted that a single human brain could comprehend and hold all existing knowledge. A scholar could be familiar with all literature of substantial importance. Even by the eighteenth century, however, the delusion of the encyclopedic man had begun to disappear, and today it has vanished completely, as knowledge has been broken down into more and more minute compartments and specialties. The burden of storing total human knowledge has been shifted to books—millions of books in great libraries. Only in that way can any degree of control be maintained over the rapidly-widening horizon of science and learning.

Mr. Downs is Director of the University of Illinois Library and Library School.
Problems of Bibliographical Control

The proliferation of literature has taken various forms. For over two centuries after Gutenberg's invention, publication was restricted almost entirely to the book, the monograph. Then, in 1665, with the inauguration of the Royal Society's *Philosophical Transactions*, the floodgates were opened to a vast and steadily expanding sea of periodical literature. Subsequently, the books and the journals were joined by the tremendous output of government publications, by great collections of historical sources and texts, and other varied types of records that pour into libraries.

In virtually every era, men have dreamed of universal bibliographies which will record all books in existence. "The first bibliographer of the modern world," Conrad Gesner of Zurich, in 1545, about a century after printing began, published his *Bibliotheca Universalis*, one of the monuments of early bibliography. His work fell far short of completeness, though, and, as Henry Bartlett Van Hoesen commented, "... if Gesner's bibliography was 'partial' and incomplete at a time when there were probably not more than 40,000 or 50,000 books in print, we may well despair of universality now."

Other attempts at universal bibliography were made by Gottlieb Georgi about the middle of the eighteenth century, and by Jacques Brunet, a Frenchman, and Johann Grasse, a German, in the second half of the nineteenth century. Essentially, none of these went beyond western Europe. There have also been more specialized efforts, e.g., the Concilium Bibliographicum, established in Zurich in 1890, to cover the literature of the biological sciences and kindred areas from all countries; and the *International Catalogue of Scientific Literature*, started at the beginning of this century, with the object of covering all fields of science. Probably the most ambitious of all enterprises in general or international bibliography is the great Brussels union catalog, sponsored by the International Institute of Bibliography, also founded in 1895.

None of these undertakings was more than partially successful in reaching its goal. The *International Catalogue of Scientific Literature* struggled along for some seventeen years, getting more and more in arrears, and finally suspended publication. No cards have been issued by the Concilium Bibliographicum since 1940. The Brussels catalog accumulated a file of about 20,000,000 cards, representing locations in large European and American libraries, until financial, housing, and other difficulties brought its operations to a standstill, leaving it in a moribund condition.³
What is the magnitude of the problem confronting us when we consider universal bibliographical control? Statistics of world book production are incomplete and inadequate. We know that book publishing goes on at a steadily accelerating rate, and since 1900 as many books have come from the presses as in the preceding 450 years. Paralleling this growth is the expansion of library collections. Estimates of the number of book titles in existence vary from fifteen to twenty million, of which perhaps two-thirds are to be found in the United States. In the periodical field, the second edition of the *Union List of Serials in the United States and Canada* recorded approximately 120,000 titles, of which 43 per cent were still current, while the third edition of the *World List of Scientific Periodicals* includes no less than 50,000 titles in science alone. It has been estimated that a complete list of serial publications in American libraries would approximate half a million titles.

The swelling tide of printed materials of course creates many practical difficulties, and ways and means are constantly being sought to hold it in check. Methods of inventory to maintain a complete record of production are discussed. National, regional, and local union catalogs and union lists have been created to locate materials. Cooperative purchasing agreements have been arrived at, such as the Farmington Plan for the acquisition of books from abroad. Regional storage centers are set up for housing little-used books. Ambitious projects are being carried forward to microfilm and microprint large masses of material, to reduce their bulk for storage purposes. Programs are functioning for subject specialization among libraries, in order to reduce the scope of their collecting activities. These are some of the devices designed to bring order and system into a chaotic bibliographical world.

Viewing the question of bibliographical control in the perspective of history, there seems little doubt that effective national bibliographic organization must precede international or universal coverage. Starry-eyed bibliographers, who for generations have advocated a worldwide approach to bibliography, present an almost unbroken record of futility, frustration, and failure, except, perhaps, when they limit themselves to special aspects. If universal bibliography is ever to be achieved, it must be grounded upon the work of individual countries. That being the case, the remainder of this discussion will be confined to problems of bibliographical control in the United States, merely noting in passing that similar measures will be required wherever the printing press is, or has been, in operation.
Problems of Bibliographical Control

Interest in this country in problems of bibliographical control is long standing. The first meeting of the American Library Association, in 1876, was instrumental in bringing about the revival and continuation of Poole's *Index to Periodical Literature*, and *The American Catalogue of Books* was started the same year. We have been concerned with these matters ever since.

The field of bibliographical control divides itself logically into four phases:

1. Complete recording of all types of printed and other types of library materials, as produced.
2. The systematic acquisition of these materials in libraries and other depositories.
3. The location of materials through union catalogs, union lists, and like devices.
4. Provision of subject bibliography in all areas.

Considering these points in the order named, the first major step toward control is a national bibliography which will record the entirety of American output: trade books and pamphlets, privately printed and research publications outside the regular book trade, government-published books and pamphlets, and perhaps motion pictures, phonograph records, music, so-called "processed" publications, and other categories. Neither the United States nor any other country now has such full coverage, though all our current bibliographical publications together come close to achieving it. The principal tools we have available are the *Cumulative Book Index*, of the H. W. Wilson Company, the *Library of Congress Catalog*, and the Copyright Office's *Catalog of Copyright Entries*, all appearing periodically, and each with distinctive features. There is a certain degree of overlapping, though probably not serious, among the three publications. As an up-to-date, world-wide list of books published in the English language, Wilson's *Cumulative Book Index* is an invaluable aid for the book trade and library acquisition activities. It is not a substitute, however, for the record of library locations and cataloging data supplied by the *Library of Congress Catalog*. The latter also has the advantages of retrospective listing, and of covering titles in nearly all languages. As for the *Catalog of Copyright Entries*, here is a vast amount of material recorded in no other source, listing everything which passes through the Copyright Office, including books, pamphlets, periodicals, dramas, music, works of art, prints, and motion pictures. Clearly, each of these national bibliographies—the CBI, the L.C.
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Catalog, and the Catalog of Copyright Entries—has carved out a distinctive domain for itself, and none could be spared without leaving a gap in the record of American publishing. Ideally, it might be desirable to have everything brought together in a single, comprehensive source. On the other hand, the heterogeneous nature of the materials to be listed is a point in favor of separate groupings.

Our most prolific publisher is the U.S. Government Printing Office. When we add to its output the production of state, municipal, and other governmental agencies, the total is staggering. Books, pamphlets, periodicals, and other documents come pouring from these presses in a never-ending stream. Bibliographically, our coverage of these publications is short of perfection, for such reasons as the noninclusion of confidential reports, and decentralization of publishing, especially near-print documents, among many agencies. The combination of the Superintendent of Documents' Monthly Catalog, the Library of Congress' Monthly Checklist of State Publications, and such specialized works as the U.S. Department of Agriculture Library's Bibliography of Agriculture, provide a reasonably complete record.

Turning to the second facet of the four-point program for thorough bibliographical control, i.e., the systematic acquisition of material in libraries, this subject is of such dimensions that only cursory attention can be paid to it here. It is a fair assumption that our multiple types of libraries, in toto, are covering the bulk of all domestic publishing. The foreign field, through the leadership of the Association of Research Libraries and the Library of Congress, presents a far more cheerful picture than it did ten years ago. During and following the second World War, the Cooperative Acquisitions Project, sponsored by the Library of Congress, and aided by the State and War Departments, procured over 800,000 books and periodical volumes from abroad for the war years, and distributed them on a subject basis to about 115 libraries in the United States. This enterprise provided valuable experience for the subsequent "Farmington Plan," sponsored by the Association of Research Libraries, for the acquisition by American libraries of all books of research value published abroad. Beginning with only three western European countries in 1948, the undertaking has expanded until now it is world-wide in scope. Fifty-three libraries in the United States are participating, to bring to this country at least one copy of every monographic publication of potential worth currently issued elsewhere in the world. Each cooperating library has assumed responsibility for one or more specific subject fields or geographical areas. By central listing in the National Union Catalog
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at the Library of Congress, a complete record of locations of individual titles is maintained for all Farmington Plan books.

Like all new, large, and ambitious programs, the Farmington Plan has critics. Some suggest that it is too inclusive, and is bringing into our libraries much material of little or no value. These critics would recommend a more highly selective policy. On the other side, there are equally vocal spokesmen for the point of view that practically everything published abroad should be made available somewhere in the United States. The middle course between the two extremes is now being steered by the Farmington Plan directors. In one respect, the Plan has a major hiatus. For simplicity of operation at the outset, only monographic works were included, omitting the vastly important areas of serial publications, newspapers, and government documents. While recognizing that the complexities of the serial field are considerably greater than those associated with monographic works, eventually the Farmington Plan must extend its coverage to all types of publications, to be of maximum service to American research and scholarship.

Historically speaking, libraries in the United States have been concerned almost exclusively with materials in the Latin alphabet, which in substantial effect means publications originating in the Western Hemisphere and in western Europe. Largely ignored were eastern Europe, Africa, and the immense reaches of Asia, geographically comprising nearly two-thirds of the earth's land area, and including about 75 per cent of the world’s population. America's role as a great world power has forced us to expand our horizon. Now, through the Farmington Plan, and special agents of the Library of Congress and other large research libraries operating abroad, we are obtaining, for the first time, reasonably thorough coverage of the current literature of most countries of the world.

The third phase of a sound program of bibliographical control logically follows the first two, i.e., location. Listing the facts of publication and acquisition in libraries is not enough. We also need to know the whereabouts of materials. Here the master key is the National Union Catalog in the Library of Congress. This catalog, started about fifty years ago, at present contains approximately 13,000,000 cards, locating a much larger number of copies of books in some 2,400 different libraries. Admittedly, however, the record is far from complete. Millions of titles in libraries in the United States are not yet reported to Washington. Nevertheless, according to its latest report, the National Union Catalog is able to locate in some American
library at least one copy of 78.6 per cent of the titles for which it is asked to search. When one takes into account the fact that these are generally books which have been searched for elsewhere without success, the percentage of locations is high.

The National Union Catalog is growing steadily. For the past ten years, the Library of Congress has followed a policy of copying and incorporating cards from a number of regional union catalogs and catalogs of individual libraries. This policy has resulted in rapid expansion of the National Catalog. Future plans call for continuation of the copying program, with priority perhaps for libraries in the Far West, whose holdings are now sparsely represented. In addition, the catalogs of various university libraries, historical societies, and specialized reference and research libraries elsewhere should be copied for the National Union Catalog. Also inadequately covered are the many important research libraries belonging to the United States government, outside the Library of Congress. Altogether, these libraries contain about 5,000,000 volumes.

Aside from the problem of its future growth, there is also the question of how the National Union Catalog can be made of maximum value. At present, the Catalog exists only in the huge card file at Washington, plus a microfilm copy recently made for security purposes. From time to time, proposals have been offered for reproducing or publishing the Catalog, in order to make copies available to any research libraries wishing to purchase them. The Association of Research Libraries has a committee investigating ways and means for bringing about publication.

Supplementing the National Union Catalog are several dozen regional, state, and local union catalogs and bibliographical centers, the most active of which are those in Philadelphia, Cleveland, Denver, and Seattle. For the most part, such catalogs were begun in the depression period with W.P.A. and foundation grants, and have been continued under local sponsorship. An example is the Union Library Catalog of the Atlanta-Athens Area, at Emory University and the University of Georgia, established in 1940. Like the National Catalog, the primary concern of regional centers is the location of books, periodicals, and other materials, but they frequently perform a variety of added functions, e.g., taking the lead in regional cooperation projects, the development of specialization agreements and coordinated acquisitions among libraries of the area, aid to individual libraries in cataloging and classification, serving as clearinghouses for interlibrary loans, and the preparation of subject bibliographies.
Regional union catalogs have strong opponents and proponents. Their critics claim they are uneconomical, and that their continuation would be unjustified if the National Union Catalog were properly completed. It is suggested further that the rapidity of modern means of communication—telephone, telegraph, teletype, air mail, and, perhaps soon, facsimile transmission—render unjustifiable the expense of maintaining a decentralized system of union catalogs, and point to the desirability of having one big catalog, as complete as possible, for the whole country. Apparently equally valid arguments are offered in support of the regional plan, among them that the regional centers are providing a wider range of services than the National Catalog, the National Catalog could not afford to take over all the bibliographical services which regional centers render locally, and the decentralized arrangement gives impetus to extensive cooperation among libraries in the regions where the centers are located, a stimulus that would not be felt from a remote national organization. The fact that libraries in the regions where bibliographical centers are located are willing to support them financially, as they are doing in Denver, Seattle, and Philadelphia, is a tribute to their effectiveness and value.

The author has been a student of union catalog problems for the past twenty years and is convinced that maximum development and expansion of the National Union Catalog should be the primary objective of any union catalog program for the country. The National Catalog should receive first priority for information concerning every unusual book in the United States, though it may be futile and unnecessary to duplicate entries there for thousands of titles useful in a local catalog. As for regional union catalogs, the need for them probably varies in direct ratio to the distance from Washington. Because of time and transportation factors, union catalogs for the Rocky Mountain area and the Pacific Coast are more vital than for those states in close proximity to the National Catalog.

Related to the subject of union catalogs are union lists, of which there are hundreds of examples, national, regional, and local, principally, though by no means, exclusively, concerned with locating files of serial publications. The largest, best-known, and most-used compilation of this kind is, of course, the Union List of Serials in Libraries of the United States and Canada, the second edition of which appeared ten years ago. Not counting the large expense to individual libraries for checking their holdings, the cost of compiling and publishing that huge work was about $300,000, partly covered by a Rockefeller Foundation grant. Because of the expense involved and increased com-
plexities, it is doubtful that a third edition of the Union List will be, or can be, published in the same form as the first and second. A committee of the Association of Research Libraries, which has been concerned with the matter for several years, has proposed a national union catalog of serials on IBM punched cards in the Library of Congress. As libraries would be expected to report their holdings continuously, the record would always be nearly up to date, in contrast to the Union List, which is chronically several years in arrears. The union catalog of serials would be reproduced in book form from time to time, to be made generally available. This plan is understood to be acceptable to the Library of Congress, if financing can be arranged. The Union List of Serials has become so fundamental a research tool in libraries that means for its continuation must be found.

The fourth and last step in a thoroughgoing plan for national bibliographical control is provision for subject bibliography. Wilson's Cumulative Book Index and the Library of Congress Catalog include subject indexes to the books listed. Union catalogs ordinarily provide only an author approach, a distinct limitation on their usefulness. It is a fair statement that subject bibliography has always been, and continues to be, the weakest link in our chain of bibliographical control, and nowhere has a fully satisfactory solution for the dilemma been found. It is unquestionably the most difficult of all branches of bibliography, and satisfactory machinery for it has yet to be developed in most fields.

To round out this discussion of bibliographical controls, a reference should be made to the immense field of nonpublished or nonbook materials. This has become an area of considerable concern to research libraries. From the point of view of bibliographical control, manuscripts, maps, sound recordings, motion pictures, prints, and photographs are more complex than books and periodicals. Increasingly, libraries are developing extensive research collections in these categories, and their close relationship to printed resources is becoming generally recognized. Manuscripts and archives have been more extensively recorded than any other variety of nonprinted materials. There are, for example, the hundreds of volumes published by the Historical Records Survey, the American Historical Association, and by individual institutions. No union list or union catalog of manuscript collections, however, has been maintained. Recently, in response to appeals from various historical bodies, the Union Catalog Division in the Library of Congress has made plans for the development and maintenance of a National Register of Manuscript Collections, to
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cover all important collections of historical manuscripts in public and private possession in the United States.

In the field of maps, the Army Map Service in Washington is building up a union catalog of maps. The catalog is designed mainly to locate unusual maps not generally available, especially large-scale maps of recent date. Some fifty libraries have been reporting such items in their collections to the catalog. Another cooperative undertaking is a union list of United States atlases, published this year by the Library of Congress, listing over 7,000 atlases in 185 libraries.

These two areas—manuscripts and maps—are the only nonbook categories in which anything noteworthy has been done about bibliographical control.

By way of summary, the following conclusions might be drawn:

1. In the realm of current book and periodical publishing in the United States, an adequate though not complete bibliographical record is being maintained.

2. Devices for the systematic acquisition of published material, domestic and foreign, are being developed by American libraries.

3. Great progress has been made through the National Union Catalog, regional union catalogs, and union lists in providing access to library materials. Millions of titles, however, are still unlocated.

4. The thoroughness of bibliographical control from a subject standpoint varies with different fields, excellent in certain branches of science, for example, and inferior in other important disciplines, such as the social sciences. In general, subject bibliography is in a less satisfactory state than any other type of bibliographical service.

No one has summed up the aim of bibliographical control more admirably than did H. A. Lorentz, at a session of the League of Nations Committee on Intellectual Cooperation, nearly a generation ago: "The end to be attained is that no book or manuscript should be out of reach—that we should be able to know where any book is to be found, and how it may be made accessible as easily as possible. You may think that is a little thing, but in reality it is a great thing."

To end on an optimistic note, a statement by Geoffrey Woolfedge, a well-known British librarian is quoted: "... though it is still not so easy as it should be to find what has been written on a given point, it is incomparably easier than it was at the beginning of the century."
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References


ADDITIONAL REFERENCES


Indexing and Abstracting Services for Serial Literature

VERNER W. CLAPP

IT IS OF LITTLE VALUE to attempt to describe in detail the development of indexing and abstracting services as we now know them, but some salient facts may be useful as background. Many professions, many interests, and many individuals have contributed to the present multiplicity and variety of these services, as well as to those features of uniformity which they do in fact possess, though the converse may seem to be true.

The index itself is, of course, an ancient device, although slow to take form in its modern appearance, even after the invention of printing had standardized most other features of books. By the time periodicals began to threaten the pre-eminence of the monograph, the index was well recognized, and it was almost immediately applied to the periodical literature. The publishers of periodicals were, by and large, bibliographically conscientious, besides placing a high value on their productions.

Periodicals traditionally have been produced as actual books-in-parts, intended to be bound at the end of a convenient period, with an individual title page and a finding medium in the form of a table of contents or an index or variations of these. Thus, for example, the very first volume of the Philosophical Transactions of the Royal Society concluded with an alphabetical table, and this was also "digested into a more Naturall Method."

So also for the general periodicals. The Tatler, Spectator, and Guardian, 1709-14, even though originally issued in single sheets, without relation to book format, soon received publication in book form, accompanied by indexes. The Tatler and Guardian were reissued with notes and index in 1714; a general index to the Spectator was published in 1732; and A General Index to the Spectators, Tatlers and Guardians was issued in 1757.¹

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From the index to the single volume or issuances of the year it was but a step to the cumulative index covering a number of volumes of the same periodical. The *Philosophical Transactions* were thus provided by the Royal Society with a cumulative index for the first twelve volumes to Number 136 (1665-77, published in 1678), for Volumes 12 (Number 137)-17 (1678-93, published in 1694), and then for Volumes 1-70 (1665-1780, published in 1787). This tradition soon became so firmly fixed that Daniel C. Haskell, Bibliographer of the New York Public Library, was able in 1942 to list some four thousand cumulative indexes to important periodicals. Haskell does not list *A General Index to the Spectators, Tatlers and Guardians*, since it was not a truly cumulative index, nor was it an index to an individual periodical. This work can, in consequence, be taken as an early representative of the index to several periodicals, the next stage in development after the cumulative index to a single periodical.

We owe one of the milestones in this form of endeavor to Jeremias David Reuss (1780-1834), librarian at Gottingen and an indefatigable bibliographer. From 1801 to 1821 appeared the quarto volumes of his *Repertorium* which laid out, in full author and title entries in a minutely classified arrangement, “according to the order of the disciplines,” and with author-indexes, the contents of the proceedings of the various academic societies of letters from their beginnings in the seventeenth century down to Reuss's date, or roughly to 1800. Unfortunately, in spite of the obvious merits of his presentation, Reuss nowhere in the work listed the series which he analyzed or gave any explanation of his method, and his work was to this extent defective. Reuss is little used today, largely because of the antiquity of his material, but also because the specialized bibliographies of the various disciplines replaced parts of it in a superior presentation and have made reference to him superfluous. Such a specialized bibliography was *Bibliotheca Zoologiae et Geologiae.* But he still provides an important part of the record which should not be overlooked for many kinds of search.

Developments in the indexing of periodical literature in the United States were to have important repercussions upon indexing everywhere. The immediate force behind these developments was the emphasis on rhetoric in liberal education of the time, and the resultant interest in debating. John Edmands, librarian of the Brothers in Unity, a literary society at Yale, prepared, apparently in January 1847, an eight-page printed pamphlet entitled *Subjects for Debate, with References to Authorities.* This presented sixty-three topics, ranging from
"Slavery" through "Protective Tariff" to "May an Advocate Defend a Client Known to be Guilty?" with lists of from three to thirty references under each topic, principally to the periodical literature, and in each case a citation of the call number of the copy of the book or periodical in the Brothers' Library. This little pamphlet must have been extremely useful to the Yale debaters of the time, though no copy is listed in the catalog of the Brothers' Library for 1851 or 1873. It is an obvious prototype of such compendia as the present Debaters' Handbook series, published by the H. W. Wilson Company, a useful guide to both the periodical and monographic literature on current questions.

In 1848 William Frederick Poole, then in his junior year, became the Brothers' librarian and proceeded to generalize upon Edmands' accomplishment. Instead of listing selected references under sixty-three topics, he analyzed the contents of periodicals by the topics of the several contributions. The resulting manuscript appeared to possess such general interest that he took it to George P. Putnam who published it the same year as a 154-page octavo under the title An Alphabetical Index to Subjects Treated in the Reviews, and Other Periodicals, to Which No Indexes Have Been Published: Prepared for the Library of the Brothers in Unity, Yale College. It bore a claim of copyright in Poole's name. It listed the contents, down to January 1848, of thirty-nine general, currently published periodicals in addition to some miscellanea, but restricted itself to those volumes not covered by cumulative indexes issued by the periodicals themselves. Its entries were by subject only. The edition of five-hundred copies, Poole related, was chiefly taken by other colleges and soon exhausted. He immediately set about the preparation of an improved and larger work, and this, with six times the amount of matter contained in the first, was published in 1853. The first Conference of Librarians held in New York in that year passed a resolution of commendation, and the edition of one thousand copies was again soon sold out.

Then, strangely, the subject was dropped for more than a quarter of a century. The 1853 publication possibly represented the ultimate capacity of a single individual for indexing the general periodical literature, and no organization was as yet available to take over the task. Or the time may not have been right. In 1859 the London firm of Sampson, Low, Son and Company, publishers of The Publishers' Circular and The English Catalogue, commenced a quarterly Index to Current Literature, comprising a reference by author and subject to "every book in the English language, and to original articles in litera-
ture, science, and art, in serial publications.” This publication regularly listed, in addition to books, the contents of twenty-six British and American journals plus transactions of learned societies, reports, and parliamentary papers. It ceased after two years.

By 1876 a revival of Poole’s Index was a principal desideratum of library work in America, and the means for accomplishing it were discussed at the initial meeting of the American Library Association in Philadelphia that same year. It was determined to do the work cooperatively. Poole took over the editing, fifty-one libraries cooperated, and the resultant 1442-page work, indexing the contents of 6,245 volumes of 232 serials from 1802 to 1881, appeared late in 1882. Its immediate usefulness is attested by the fact that the British Museum (which had four copies) had to be given the right, even prior to 1891, to reprint the preliminary pages for replacement as they wore out!

At the same time that this third edition of Poole’s Index appeared, arrangements were projected for a current indexing service, to be cumulated at five-year intervals. William J. Fletcher, associate editor of the third edition, supervised what was at first a monthly index, prepared cooperatively, and supplements to the 1882 volume appeared in 1888, 1893, 1897, 1903, and 1908.

It was too much to expect that the great cooperative effort which produced the third edition should continue indefinitely. As Poole himself foreboded, “When we begin to pay for service the knights leave the line, and their places are filled with retainers and camp followers.” The accomplishment that was economically feasible through unpaid cooperation became an impossibility when these services had to be bought. Fletcher’s index declined from a monthly to a quarterly, and then to an annual.

At this point (1900) the program was rescued through the technological, bibliographical, and merchandizing genius of H. W. Wilson, a Minneapolis bookseller. It may be noted that Wilson received suggestions in the development of his bibliographical services from Herbert Putnam, the public librarian of Minneapolis, one of whose father’s earliest publishing ventures, under his own name, had been the first edition of Poole’s Index. More than half a century later, in 1953, Wilson retired from the presidency of the company bearing his name to become chairman of its board. At that time it was issuing some thirty current periodical indexing services and had published, in addition, among many such works, some of the largest bibliographical compilations ever seen.
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A leading spirit of the first Conference of Librarians, in 1853 was Charles Coffin Jewett, the inventive assistant secretary and librarian of the Smithsonian Institution. It was to Jewett that Poole dedicated his second edition. The conference passed a resolution commending Poole’s Index, and added, “. . . and we recommend that a similar system of indexing be extended to the transactions and memoirs of learned societies.”

Actually, this was already the second step in a campaign. In 1851 Joseph Henry, undoubtedly influenced by Jewett, had inserted into his report as secretary of the Smithsonian Institution a passage calling attention to the need for such an index. As it became apparent that the Smithsonian could not do the job single-handed, Henry conceived the plan of dividing the work. To this end, in 1854, he addressed a letter to the British Association for the Advancement of Science offering the cooperation of the Institution in such a task. This letter was taken up at the Glasgow meeting of the Association the following year, and a committee appointed. Although the proffered cooperation of the Smithsonian could not be furnished, the Royal Society of London undertook the entire task itself, later securing a subsidy from the British Treasury to effect publication. The result was the Royal Society’s Catalogue of Scientific Papers, 1800–1914, the first volume of which, appearing in 1867, gave handsome acknowledgment to Henry for the initiating suggestion. This monumental work, which forms for general purposes the principal index to scientific communications of the nineteenth century, extended to nineteen volumes of author-title entries, arranged alphabetically by authors’ names and providing a record of the contents of 1,555 series of periodicals, transactions, reports, etc. In addition, four volumes of a subject index have been published out of a projected seventeen.

From 1867 events in the field of periodical indexing began to multiply so rapidly that it is almost impossible to record even those which would be acknowledged to have major importance. One of these, however, was John Shaw Billings’ Index-Catalogue of the Library of the Surgeon General’s Office of the U.S. Army, inaugurated in 1876, just previous to the meeting of librarians in Philadelphia which clamored for a third edition of Poole. The Index-Catalogue, which has now reached its sixtieth volume, was intended to make everything in the library easily accessible to the reader, including all principal original papers in journals or transactions as well as books. These were listed in a single alphabet combining authors and subjects, and by 1948 the Index-Catalogue had listed 2,457,693 papers under
its subject headings, and 407,508 monographs. It became a major resource of research in the medical literature because of the comprehensiveness of the Army Medical Library's collections. Because the *Index-Catalogue* could appear only at an interval after the publications which it indexed, Billings also, in 1879, launched the *Index Medicus*, a monthly record of current medical literature. The *Index Medicus* has since become the *Quarterly Cumulative Index Medicus*, published by the American Medical Association, which aims to analyze quarterly, with annual cumulations, about 1,200 medical journals in a dictionary-catalog arrangement, while the *Index-Catalogue* has given way to the *Current List of Medical Literature* of the Armed Forces Medical Library, a monthly current listing, in table of contents order and with author and subject indexes, cumulative annually, of the contents of 1,350 journals, amounting to 104,909 separate articles last year. These two indexing services are engaged in an unequal and not well coordinated struggle, and with the use of very different bibliographical techniques, to provide a key to the ever rising tide of periodical publication in the medical field.

Though Poole, in the preface to his third edition was able to speak of Billings' *Index-Catalogue* as in some degree unique in meeting the needs of specialists, and to urge that the same kind of thing "ought to be done by other specialists for law, botany, geology, astronomy, and every other profession and science," the floodgates of specialized indexing were actually opening while he wrote.

The *Engineering Index* commenced in 1892 (with references from 1884), the *Astronomische Berichte* in 1893, and *Physics Abstracts* in 1898. The *Zoological Record* had commenced in 1864, furnishing a continuation to Agassiz, just as in Germany the *Zoologischer Jahresbericht* from 1879 formed a current continuation of Engelmann. *L'Année Biologique* started in 1895, and in 1896 the *Concilium Bibliographicum* initiated an indexing service for zoology and related studies both on cards and in journal form.

At the turn of the century the Royal Society of London perceived the possibility of so organizing the annual record of scientific production that a single series—the *International Catalogue of Scientific Literature*, in 17 sub-series—might eliminate the necessity for many competing and diverse publications. The attempt was heroic; it continued until the first World War, by which time it had produced nearly 250 volumes; but lack of money and international cooperation have prevented its re-creation.

After 1900 the services continued to multiply. The *Geologisches
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Zentralblatt was established in 1901, the Bibliography of North American Geology in 1931, and the Bibliography and Index of Geology Exclusive of North America in 1933. American chemists, not satisfied with the Chemisches Zentralblatt, which had been going since 1830, established Chemical Abstracts in 1907; and British Chemical Abstracts was founded in 1923. Biological Abstracts was established in 1926; and Excerpta Medica, a general medical abstracting service, has appeared since 1946.

Philology had seen the rise of important services at an earlier date: the Jahrbuch für romanische und englische Sprach und Literatur in 1859, Bibliotheca Philologica Classica in 1874, and the Jahresbericht über der Erscheinungen auf dem Gebiete der germanischen Philologie in 1879. The Modern Language Association's American Bibliography commenced in 1921, and L'Année Philologique in 1928.

In the social sciences, the Bibliographie der Staats und Wirtschaftswissenschaften commenced in 1905, and Public Affairs Information Service in 1915. Social Science Abstracts ran from 1929 to 1933 and has not been resuscitated, while the London Bibliography of the Social Sciences has provided, from 1931, a recurrent retrospective view. International Political Science Abstracts started in 1951.

Writings in American History has attempted to provide a current record since 1906, and the International Bibliography of Historical Sciences since 1926. The Répertoire d'Art et d'Archéologie dates from 1910, Bibliographie de la Philosophie from 1937, L'Année Psychologique from 1894, and Psychological Abstracts from 1927. Palmer's Index to the Times Newspaper commenced in 1868, and the New York Tribune published indexes for a few years from 1875. In 1907 the London Times commenced its own Official Index, the Monatliches Verzeichniss was established in 1909, and the New York Times Index started in 1913.

Finally, the Index to Legal Periodical Literature, filling a gap in the extensive panoply of legal indexing, was established in 1909.

In summary, there were available on a world-wide basis in 1951, according to a recent and demonstratedly imperfect census, the Index Bibliographicus, some 3,300 current periodical abstracting and indexing services "useful for retrospective searching." Of these, 1,300 were in the fields of science and technology, and 2,000 in those of the social sciences, education, and humanistic studies. A recent census by Dwight E. Gray and Robert Bray of the Library of Congress is showing that there are about 250 abstracting services in science and technology alone published in the United States.
The *Index Bibliographicus* figures refer to published indexing services exclusively, without discriminating among them. They include great comprehensive specialized services, universal in scope and coverage with respect to their specialities, as well as services which are selective within wide ranges of scope and criteria of choice. They include weekly journals which give rapid reporting and annuals which are greatly delayed, journals with an enormous range of variation in manner of presentation as well as services in card format (there are at least six of these in the United States). They do not include the important unpublished indexes which are maintained in many places and which are often the primary bases around which special research libraries are built, or which may perform primary service for research in the field. Such is the anthropological index at the Peabody Museum at Harvard. It is in the nature of such indexes to become retrospective, though they quickly lose their value if not maintained currently. A list of them in American libraries, contained in *Local Indexes in American Libraries,* could be extended greatly. Sometimes these indexes are retrospective from the beginning, like the index to early American periodical literature, 1727-1870, at New York University. It is also in the nature of such indexes, if they are important to a sufficiently wide group, to be published, as the *Virginia Gazette Index.* And they evolve into comprehensive bibliographic compendia, such as Beilstein’s *Handbuch der organischen Chemie* or the *Cambridge Bibliography of English Literature.*

No library can afford to subscribe to and display all the periodical indexing services. The searcher who would make use of all the services that were possibly appropriate to a particular search would be long coming to the actual commencement of his work. Even possession of all published indexes would fail to provide a complete key to all the periodical literature in any but the smallest library. Indexing services are so varied in presentation that they cannot be displayed or made known to the searcher in any simple arrangement. They provide him with neither certitude of comprehensiveness nor the mechanisms for selectiveness, and at the same time they aggravate him with a great deal of overlapping and duplication. Gray and Bray found that 47 per cent of the articles abstracted in *Physics Abstracts* during the first six months of 1948 were also abstracted in *Chemical Abstracts.* Barbara Cowles, for the American Library Association’s Committee on Indexing and Abstracting Services, found in 1937 that a principal American indexing service in a broad field covered only 7 per cent of the known American and Canadian periodicals in this
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field, while at the same time 67 per cent of the periodicals which it did index were also included in another closely related index.31 One of the publishers concerned promptly retorted that there would be no point in indexing all the known periodicals, since files of most of them were rarely found in American libraries. Librarians had neither asked that they be indexed nor shown a willingness to pay for such a service.32 Henry Black, at about the same time, questioned whether matters of this kind should be left solely in the discretion of librarians, showing that the principal indexing services, all together, indexed only three trade union organs.33 He started with the premises that there is not enough indexing but that it is yet impossible to index everything, and suggested a permanent body, on which all producing, consuming, and intermediatory groups would be represented, to prescribe what should be indexed.34 Mrs. Cowles similarly arrived at a proposal that there should be a coordinated and federally supported system for providing indexing and abstracting services in all major fields of research.35

The aftermath of the second World War has brought us a new round of proposals, this time based on the separate. Separates, in the form of unpublished but multifolded research reports, have become a commonplace in scientific and technological research. They have produced their own indexing and abstracting services, such as the monthly Bibliography of Technical Reports issued by the U.S. Department of Commerce. It has been proposed that if all articles could be printed as separates, and their distribution centralized, arrangements could be readily made by which everyone could receive publications in his field, in accordance with previously registered expressions of interest.36, 37 Such systems might lead to, but would not, however, effect, a solution of the indexing problem.

The root of this problem is that indexes and abstracting services serve very different ends for different users. The librarian would like them to index, cheaply but efficiently, the contents of his library, yet provide references to material not in his library to the extent that that might be desired. He would like indexing services to be exhaustive, at least for particular journals. The professional worker, however, needs indexes, first, to keep him easily abreast of the literature of his field, and second, to serve for retrospective searches of all the literature appropriate to his subject, without regard to the limitations of one library. He is anxious, not for the exhaustion of particular periodicals but rather of articles on a particular subject, no matter where found. To both groups duplication or overlapping is
important, but in opposite directions—the librarian would prefer not
to have to pay for the same material indexed several times over; the
professional worker is not satisfied unless all the material of his in-
terest is indexed in a single service. Multiplicity of services is to both
an abomination, but each party would resolve the problem of multi-
plication in different ways.

What happens is that the professional worker tends to rely on a
few services which, experience has shown him, provide the materials
of his craft. Occasionally he will join with his fellow workers to
launch a new service (if the common interest and the prospect of
financing can be found) more nearly adapted to his immediate needs
than existing services, and with little regard to overlapping with
others. All these the librarian must purchase in order to facilitate
the work of his clientele, and he is shocked at the price which he is
paying for duplication, yet without securing full coverage.

The professions, worried by bibliographic problems, establish liter-
ature groups or launch surveys or research projects, such as the Med-
ical Indexing Project at the Welch Medical Library, the Study of
Physics Abstracting of the American Institute of Physics, or the
Symposium on Searching the Chemical Literature of the American
Chemical Society. At the international level, Unesco, after receiving
almost unanimous complaints from the representatives of all disci-
plines, established an Advisory Committee for Documentation in the
Natural Sciences, a Committee for the Coordination of Documentation
in the Social Sciences, a committee on bibliography of the Interna-
tional Council for Philosophy and Humanistic Studies, and an Inter-
national Advisory Committee on Bibliography. The International
Council of Scientific Unions has established an International Abstract-
ing Service. AGARD (Advisory Group for Aeronautical Research
and Development of the North Atlantic Treaty Organization) has a
Documentation Committee which attempts, among other things, to
coordinate abstracting services in its field.

All of these groups, and others, have in the postwar period shown
some progress, either in the improvement of existing indexing services,
or even—but to a much less degree—in coordination of services in
the same field. Coordination across subject areas is virtually unknown.

Where the need is so pressing and activity so prevalent, it may
be supposed that improvement will eventuate. An economic crisis in
the affairs of the indexing services might conceivably precipitate co-
ordination overnight. It is hoped that this need not happen, but that
services may gradually be so rationalized as to provide much better
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than now the characteristics of comprehensiveness, selectivity, and intercoordination with which they could render more efficient service. For such a rationalization there are a great many prerequisites, not the least of which is a general understanding and appreciation of the importance of the periodical indexing services to research and respect for them in economic support. A recent estimate, by a responsible agency, that the national expenditure for literature-searching is in the order of $300,000,000 per year would seem to justify such respect.45

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Mechanical and Electronic
Aids for Bibliography

RALPH R. SHAW

BIBLIOGRAPHIC WORK consists of a complex of operations, some of which appear susceptible to mechanization and some of which do not. The systems pattern in bibliographic work appears to consist of nine processes, each in turn, including a range of operations. The basic processes which form parts of any bibliographic system are:

I. Planning the bibliography
II. Searching to locate items that may be pertinent
III. Copying citations that may be pertinent
IV. Locating copies of the items cited
V. Verifying the references
VI. Analyzing the articles to determine whether they are pertinent (and in some cases annotating or abstracting)
VII. Organizing the citations into the most suitable form
VIII. Editing the manuscript and preparing it for reproduction
IX. Reproducing the bibliography.

The operations under these processes are approximately as follows:

I. Planning the bibliography
   A. Determining the scope of the bibliography: i.e., defining the subject of the search, the period to be covered, the geographic areas and languages to be covered, the types of material to be covered, the inclusiveness, i.e., completeness of listing, exclusion or inclusion of various aspects or treatments of the subject, etc.
   B. Determining the sources to be searched.
   C. Determining the headings under which the search will be made.
   D. Estimating the time required and scheduling the operation.

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II. Searching
   A. Consulting the sources under the subjects indicated, and selecting possible references according to criteria set in I.
   B. Modifying the list of sources and of headings as indicated.

III. Copying the citations that appear to be pertinent.

IV. Locating copies of citations noted
   A. In sponsoring library
      1. Getting call numbers
      2. Preparing request slips and/or
      3. Getting from shelves.
   B. Elsewhere
      1. Locating copies, and
      2. Borrowing or visiting other collections.

V. Verifying the citation—comparing citation with publication for accuracy and completeness.

VI. Analyzing the article to determine whether it is actually pertinent to the search being made. This step frequently includes annotation, or abstracting, to indicate the material in the citation that is pertinent to the particular search being made. (Additional searching by checking literature cited)

VII. Organizing material: i.e., determining, based upon I, the most suitable form of organization and putting it into that form by classifying the citations, arranging them in chronological or other order, or by writing a review article, indexing the bibliography, etc.

VIII. Editing, including revision and mechanical editing. The revision consists primarily of an overview of the whole of the report to make sure that it does in fact achieve the objectives set forth under the plan prepared as step I, and that it is consistent. Editing consists of preparation of the copy for reproduction and taking care of the mechanical consistency of the citations or report, and preparation of the copy in final form, proofread and ready for reproduction.

IX. Reproducing, including the preparation of the list in final form, whether that be achieved by typing, near printing, or other means.

Some of these steps, such as IV and V, may be omitted in preparation of nonselective booklists, but such lists represent a very low order of bibliographical work, a task which is more nearly clerical than professional, since the judgment factor is at a minimum.

Having outlined the operations involved, it is now feasible to ex-
amine the possibilities for mechanization of each of these operations, the mechanical and electronic devices available or foreseeable, and the operations and levels of operation at which these are, or may be, applicable. Before this is done, however, it is necessary to note that while there are only a very few potentially applicable electronic devices available or foreseeable, there is a wide range of mechanical devices, of various levels of sophistication, now in use for bibliographical work. The electronic devices are, as summarized before, the computers, the Rapid Selector, the Hollerith card machines of the Samain or Luhn type, and even more experimental devices such as the electronic reading pencil and the various new devices for direct reading, encoding, and reproducing of alphabetical information.

Many of the mechanical devices are so familiar that they tend to escape general identification as mechanical devices. These range from the lead pencil to the card catalog, the book catalog, the bibliographical tool, and the book. More generally recognized mechanical devices are the typewriter, the mimeograph, the multilith machine, and the photographic devices. Electromechanical devices, such as the card- or tape-operated electric typewriter, machines of the Hollerith type, selector actuated addressing devices of various types, and electronic equipment, are uncommon enough in libraries to be generally recognized as machines.

Having this general outline of bibliographic work and of electronic and mechanical aids, it will be useful to examine the bibliographic operations step by step, in terms of their relative importance in the system of bibliographical work and in terms of the degree to which mechanization appears feasible, and to discuss the types of mechanical devices that appear applicable.

As is apparent from the list of operations, bibliographic work is a complex of intellectual and mechanical operations. The intellectual operations are clearly paramount, and no degree of mechanization available or foreseeable appears to offer promise as a substitute for the basic intellectual operations involved. The most that can be hoped for is that equipment may be used to reduce the human effort expended on the mechanical operations, thus freeing time for more of the intellectual effort. It should be noted, however, that in practically all fields scientific management has reduced the amount and types of work that require intellectual effort—for example, in the machine shop, before the days of prescheduled and predesigned operations, every operation required independent judgment, and many steps required pooled judgment through conference with the foreman and
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others. Similarly, if and when bibliographic work becomes more systematized and if and when mechanical devices (particularly photographic devices) become as common as the lead pencil or the mechanical typewriter, many operations which are now performed in intimate relationship with the intellectual part of the work will be isolated and will be handled mechanically. Even after that has been carried out to the greatest extent conceivable, there will still be a core of intellectual work which is not susceptible to mechanization.

I. Planning the bibliography

In the first process, planning the bibliography, the determination of scope hardly seems susceptible to machine treatment.

II. Searching

A large part of the searching operation, process II, is clearly susceptible to mechanization. This part is now a mechanical process consisting of such activities as locomotion to reference tools, handling sources, and turning pages. Reading citations and comparing them with the general criteria, likewise, is either mechanical or, at least, is an operation that can be and has been expressed in machine language and performed by machines.

This is the part of the bibliographic system that has been the source of much loose speculation on the mechanization of bibliography (and of libraries), as well as the subject of much constructive work. Book catalogs, card catalogs, conventional bibliographies, selective addressing machines, notched cards of the McBee and Zator types, punched-card machines, electronic computers, and the Rapid Selector have all been used to varying extents to perform this function. This function is merely the mechanical act of selecting in accordance with predetermined criteria.

A second part of this process, the modification of the list of sources and of subject headings, is normally performed as part of the selecting operation. This is an intellectual process, and no way of wiring machines to modify or extend their criteria appears likely to supplant mature judgment. This is not a good field for mechanization because it is a nonrepetitive operation and one which may not be completely logical. It will, in the present or foreseeable state of the art, continue to be done by human intelligence. The only difference apparent at this stage is that this operation will be separated from the search operation, where the search is mechanized, and modification of the list of sources and the list of headings will become a part of process
VI, analysis after which one or more of additional searching cycles will be added.

III. Copying

Copying, which is limited to physical transcription of the citation or data, or both, has not been automatized to any appreciable extent. While this is always a purely mechanical operation, of all the machines proposed or available only the selective addressing devices and the Rapid Selector provide for copying the citation directly and automatically as part of the searching process. Notched cards and punched cards can carry the citation in legible form (as do printed bibliographies) but copying must be performed as a separate operation. Insertion of microfilm frames into notched cards and punched cards affords storage of as much as a full page of text, but copying this frame has not been made automatic. Of all the devices now known, the Rapid Selector is the only one that provides for automatic copying of the data as part of the search process.

Introduction of the Photoclerk has indicated that the copying of citations from catalogs, bibliographic sources, and even pages of books can be mechanized when there is enough volume of copying to justify mechanization. Since the volume required to justify such simple photographic devices as this is quite small and the machine can be used for many other routines as well, it appears likely that a good deal of the work of copying citations from bibliographic sources will be mechanized. This is of particular value in copying citations in non-Roman alphabets and those in English in highly technical subject fields. In addition to reduction in cost this method offers increased accuracy, since it is difficult to transpose numbers or otherwise garble citations in copying photographically.

IV. Locating copies of the items cited

A. Location of the original book or article, and obtaining it when it is in the library in which the search is being made, is a relatively simple routine. It could be mechanized, and in a relatively small number of cases parts of it are mechanized by such devices as book lifts, book conveyors, and book trucks.

The operations involved are:

1. Getting and recording the call number. This could be mechanized beyond the use of the card catalog, but in the present state of mechanical and electronic devices it is difficult to postulate any set
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of conditions under which the more sophisticated devices could compete in this operation with manual use of the author card catalog.

2. Preparation of call slips (when the bibliographer does not go directly to the shelves). Here again we have a very simple operation which could be mechanized. However, the time required to write a call slip is so short and the number written at any one time, i.e., the number of items a bibliographer could examine within a reasonable period, is so small, that again, it is difficult to visualize any mechanism that could economically vie with the lead pencil or the typewriter. In a limited number of cases, in which large numbers of call slips are required and in which the photographic copy can be used in lieu of the conventionally ordered call slip, it might well be possible to do this job with the Photoclerk, but it appears that this would be the exception rather than the rule.

3. Getting books from the shelves. This could be mechanized. There is nothing novel about the idea of a completely mechanical stack, and such a stack could be built according to any one of several known operating principles without any great amount of research or development of work. Mechanisms do exist which will select one ledger from a group of ledgers in a safe, bring it out to the work space and return it to its proper place in the safe when work on it is completed. The only question then is not whether we can mechanize the bookstack further, but whether it is worth while. If this is ever tested it will probably be most feasible to try it first in a storage type stack rather than a stack in which browsing is permitted. But whether it is to be done must be determined by studies of the capital investment involved (amortized over a reasonable period) plus operating costs, as compared with the cost of obtaining books from the shelves, returning them to the shelves, and keeping the stacks in order by the present methods. It might be possible in mechanizing the stacks to reduce aisle space and to eliminate floors so as to obtain more storage per cubic foot, and that, too, should be taken into consideration in designing the automatic stack and in comparing it with conventional stacks and conventional book retrieval methods. However, the necessary economic studies have never been made, and until they are we will not know whether mechanization of the bookstack is desirable.

B. Getting books from other libraries. The additional operations involved when the books needed are not in the library in which the search is being made are: (1) locating copies and (2) the interlibrary loan procedure or visits to other libraries.
RALPH R. SHAW

1. The steps involved in locating copies are not too different from those involved in determining a call number except that different reference tools are used. This could be mechanized, but the same question arises as that in relation to mechanization of the finding of call numbers.

2. Interlibrary lending has been mechanized to some extent by the substitution of photographic copies, the use of simpler wrapping devices, and, to a slight degree, the provision of standard interlibrary forms. Basically, there are two methods for satisfying requests from a distance. The conventional method is lending of the book or other physical object. A variant on this method, which has been proposed and discussed but has not been put into practice in any appreciable degree, is the substitution of a reduced facsimile edition for lending of books. Under this proposal microcards, or microprints, would be sent in lieu of lending. Since both of these are edition processes rather than single copy processes, this proposal would involve stocking of duplicate sets of the materials to be lent and that would involve considerable costs. Also, the facilities for reading these types of materials are still limited, so there would need to be consideration not only of what items were to be stocked but of what users could accept and use this type of substitute material. The second method for handling requests from a distance, suitable particularly for short-run requests, is the whole range of single-copy copying services, including microfilm, photoprints, reduced photoprints pasted on cards (after the fashion of microcards but prepared automatically, directly on 35-mm. paper, one copy at a time, and automatically pasted on cards), ozalid, and many others.

A newer method that has been proposed is the use of facsimile transmission, and this has been tried out by the Atomic Energy Commission. To date, the systems for facsimile transmission that have evolved have been too slow to promise any advantage over conventional photoprint services, in other than most exceptional cases in which speed in obtaining an occasional page may be more important than its cost.

V. Verifying the references

This consists of checking the citation with the original to make sure that the citation is correct. Presumably, by the use of some of the newer alphabetic reading mechanisms, this could be mechanized. However, the devices for reading alphabetic material electronically are new, imperfect, and exceedingly limited in range at the present
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time, and it appears unlikely that these will be of much use for some time to come for other than specially prepared alphabets in specially adapted order.

VI. Analyzing the articles to determine whether they are pertinent (and in some cases annotating and abstracting)

This operation involves reading of the articles in the light of the criteria established under I to determine whether they contribute to the basic purpose of the search. If they do, it then requires brief statement of the contribution. This step does not appear susceptible to an appreciable amount of mechanization. Theoretically, the electronic reading pencil, which has been described in the references cited, could be used to copy pertinent words for a crude form of annotation, but this device is not perfected as yet.

The analysis of the article usually involves additional searching by checking the literature cited when pertinent material is found in an article and when literature cited appears relevant. This is a supplementary searching operation and requires repetition of the steps III, IV, and V.

VII. Organization of the material

This includes judgment as to the most suitable form of organization as well as putting the material into that form. Here again judgment enters so deeply into every part of this series of operations that mechanization does not appear very likely.

VIII. Editing

Operations included as editorial work include reviewing for consistency of treatment of the bibliography as a whole and adequacy of the bibliography as a whole as well as copy editing to make sure of consistency in form. Little of this, if any, is subject to mechanization at the present time.

IX. Reproducing

Reproduction is a purely mechanical operation, regardless of whether the reproduction takes the form of cards to be filed in the catalog or typewritten, mimeographed, multilithed, offset, printed, or otherwise reproduced lists; and the whole gamut of printing, near-print, and office copying equipment is, of course, applicable, as are the devices for mounting cards for photographing and similar office tools.

Having reviewed, step by step, the work of preparing a bibliog-
raphy it appears that operations which are not susceptible to mechanization outnumber those which are. This does not mean that mechanization will not be used. In fact, as noted, it invariably is used to some extent even if it is of as low an order of mechanization as standard typewriting or writing. However, the use of sophisticated mechanical and electronic devices appears to offer promise primarily in the areas of searching, copying, obtaining copies, and reproducing.

The mechanical devices currently available for economic use in libraries are few and simple. None of the electronic devices now on the market appear to offer any likelihood of widespread adoption or adaptation to library purposes for the present or for the immediate future. Mechanical or electronic devices are costly by most libraries' standards and are economically usable only where there is enough volume of productive work to keep them busy for a material portion of each day. Very few libraries can supply the necessary work load for economical operation of any mechanical device that costs as much as $10,000, yet many of the devices that have been suggested for library or bibliographic operations cost that much or more per year. The libraries in the country that have as many as five full-time people working on bibliographical work day in and day out are few. Furthermore, large-scale machine operation bespeaks large-scale preparation for machine operation. That again indicates that the widespread application of Univacs, Memexes, Rapid Selectors, and Electronic Punched Card installations to libraries in general is far in the future, unless technological change simplifies and cheapens these and thus makes possible their use with limited collections. The present day field for these sophisticated electronic and electromechanical devices would appear to be limited to custom-made apparatus for the few library applications that would appear to justify such equipment. If these devices can be simplified and brought down in cost, then it might be possible to use them in libraries on a wider scale; or if library operations in general should become much larger than they are now, they might justify larger investments in equipment.

As has been pointed out before, much of the mechanical equipment now available is too slow for the handling of very large files, and is too costly for handling small files. Depending upon the type of search, it is even doubtful whether the fastest electronic machine that we can postulate will ever be able to search for a series of author entries as rapidly or as economically as that can be done in a conventional card catalog. It should be remembered that the preparatory work of descriptive cataloging would have to be done pretty much the same way
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in either case. The only costs and times that would be different would be those for construction of the card catalog, preparation and filing of cards, maintenance of the card catalog, and the finding of citations in a card catalog of a million or more cards, as compared with those for construction of the machine, introduction of the same information (represented by the catalogers revised draft) into the mechanism, operation and maintenance of the mechanism, and reproduction of the data as required.

Nevertheless, there are many operations in which the more sophisticated types of mechanisms appear desirable and promising. When large files have to be maintained and when they have to be searched repeatedly for subject information, great reduction in space requirements and in searching time and in copying time may be achieved by mechanization. In a number of cases these savings may well be great enough to more than offset the cost of the equipment. As machines are developed to meet the need in these limited cases, the product will become available to others, thus providing a secondary mechanization of libraries which cannot justify machines of their own, and helping to keep the machines busy enough to make them pay their way. Furthermore, as development work on these machines progresses, they will inevitably be simplified and reduced in cost, so that eventually they will be inexpensive enough for general application. However, progress will be aided by recognizing the areas of potential usefulness of the machine and by planning for the concomitant intellectual processes without which machines cannot, according to the analysis above, serve any useful bibliographic purpose.

References


Photographic Reproduction of Research Materials

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In opening this discussion of photographic processes of reproduction, brief mention should be made of some of the older and better-known techniques. The original large negative-contact print process is now seldom used for textual reproduction because of its high cost, except where illustrations are required for subsequent reproduction in a printed work. Similar to this process is the series of blue-print and diazo-print processes using very inexpensive light-sensitive papers. The rather large and expensive equipment, the nonpermanent character of the prints, together with a limitation to copying only from originals with text on one side of reasonably translucent, separate sheets, have heretofore limited widespread application of these processes. The introduction of less expensive, office type diazo printing equipment and growing experience in use, particularly for the limited distribution of scientific and technical reports, suggests that the diazo processes are likely to be used more generally in the future than in the past.

The best known of all photocopies are those which have, by common acceptance, come to be called photostats. Using rather large cameras with the image passing through a mirror or prism to avoid reverse reading, documents are copied directly onto light sensitive, silver emulsion papers. Highly legible permanent copies of a great variety of originals can be made. The process is still efficient for short runs of textual reproduction, and where only one or a very few copies of an original are required. For large-scale use and multiple copies the labor costs tend to make the photostat processes rather expensive. The possible future development of small, highly mechanized photocopying cameras with integral processing equipment may greatly extend this general technique. Such machines would occupy a position between the conventional photocopying camera and the process of

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fully automatic enlarging from microfilm onto sensitive paper as in the wartime V-mail process. The costs for such enlargements are small, but the equipment for producing them is very costly and suitable only for large volume operations.

The transmission and reflex contact processes have recently become much more attractive than formerly because of fast single bath developing and fixing with solutions that can be applied so briefly that the sensitive paper emerges only slightly damp and ready for use. There now seem to be three rather distinct processes of which the simplest uses a single sensitive sheet to make transmission or reverse reading reflex negatives in the conventional manner, but with single solution fast processing. In a second process the negative sheet is exposed and is then developed in close contact with a positive "transfer" sheet. A positive image is transferred to the second sheet which emerges ready for use and the negative is discarded. A third process relies upon a physical transfer of a positive image from a negative "matrix" to unsensitized paper. From one to about five such transfers may be pulled from the same matrix. Owing to the simple equipment, the immediate production of a positive copy, the small space required, the relative ease of operation, and the moderate capital investment, these processes are likely to find an increasingly wide application in libraries and offices for the reproduction of small quantities of material when only one or two copies are required. In terms of legibility the results of most of these processes, with reasonable care, are satisfactory though probably not as high as that of well-made photostats.

We turn now from those processes which produce copies at or near the size of the original to those in which the image of the text is reduced to such an extent that optical enlargement is necessary before the text may be read. Of these processes, the most widely known and generally applied is that of microfilming. While microphotography is anything but modern, it did not come into general use for record copying purposes in commercial applications until late in the 1920's. It was not widely applied to scholarly problems until the middle and late 1930's. Conventional microfilming, as practiced in the United States, has involved the photographic reproduction of textual materials on film in 16 mm., 35 mm., and 70 mm. widths, and in lengths from a few inches or feet up to approximately 100 feet. The great majority of scholarly applications have used 35 mm. film, while commercial applications have relied heavily on 16 mm., with 70 mm. film used primarily for the copying of engineering drawings.
In commercial and industrial practice, microfilming has had no serious competitors in applications directed toward the physical preservation of document files, the security of records against war risks and other similar catastrophies, and for reductions in the space and equipment used for the storage of inactive records. In scholarly applications the distinguishing characteristic of microfilm has been its adaptability to a wide variety of originals and copying objectives. It is unique in its ability to produce a single copy of an original book, or even several hundred volumes, at rates that are on the whole reasonable, though by no means negligible. Once a master negative microfilm has been produced, almost any number of positive copies may be made from it at one time or over a period of years. This distinctive permanent in-print characteristic can become one of microfilm's most important contributions to research literature problems. The major applications of microfilm can be grouped in a variety of ways but, for our purposes, perhaps a division into three categories would be most useful: (1) those applications where the primary objective is to increase the ease of access to a text; (2) those applications where the primary objective is to preserve books or manuscripts from physical deterioration or destruction; and (3) those applications where the primary objectives are to save space, to increase internal operating efficiency, or in other ways serve as an ancillary process to some other operation. It will be noted that many applications fall into two or more of these categories simultaneously.

Because of the growth of literature, it may be anticipated that the research library in the future will be less and less autonomous in its resources and that we shall have to rely increasingly upon each other and such devices as regional storage libraries for many little-used literature requirements. If this interdependence is to be at all successful, the means by which libraries can make use of each other's resources must, in the interests of scholarship, be efficient, and, in fact, so efficient as to produce demonstrably better results than the traditional patterns of largely autonomous research collections.

Microfilm is making an important contribution in this direction at the present time, for it permits the historian in Athens, Georgia, for example, to have access, without leaving Athens, to an important collection of manuscripts in the Bancroft Library at the University of California. The cost is clearly less than that of going to California to consult the originals (unless the number of manuscripts required is very large) or that of having them reproduced by any other technique (unless the number of pages is very small). The further extension of
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microfilm in such applications should be anticipated. Where the access is to unique materials located in Europe, or in remote parts of the world, the benefits to be obtained are, of course, substantially greater and no other technique now available seems to offer advantages as great as those of microfilm.

The widespread use of microfilm to meet a known and very specific need is paralleled by a large number of applications directed toward future or potential needs of research library users. Such projects have had one or both of two characteristics: either a large mass of material has been copied in one institution and deposited in another, or a large mass of material in one institution has been cooperatively reproduced and positive copies deposited in each of the cooperating institutions. The Library of Congress with its wide-ranging interests and extensive resources has undertaken a number of projects typical of such major applications. It has brought to this country for either its own use or on general cooperative projects microfilm copies of manuscripts and other important materials from Jerusalem, Mt. Sinai, Mexico City, the Japanese Foreign Office, a large number of British manuscript depositories, the National Library of Ireland, etc. On the domestic level, and with the cooperation of the University of North Carolina, the Library has sponsored the assembly, under the direction of W. S. Jenkins, of the significant statutory, constitutional, executive, administrative, judicial, and legislative records of the American colonies, territories, and states, in some 1,701 rolls of microfilm. The films acquired in such large scale undertakings add immensely to the scholarly resources of the country and at the same time reduce the risks of wartime loss.

There are a series of similar applications that more nearly approach the publication of unique originals or the republication of out-of-print items in microfilm form. The sale by the Wisconsin Historical Society of microfilm positives of parts of its Draper Manuscript Collections serves as an illustration. Even more closely related to actual scholarly publishing are the distribution by a number of universities of dissertations in microfilm form through their own facilities or through University Microfilms, Inc., and the University of Chicago project of publishing in microfilm form a series of manuscript studies on Middle American Linguistics and Cultural Anthropology.¹

While use of microfilm is inevitably related to access, we may separately recognize it as a tool directed primarily toward the preservation of the text of the important records of man, assuming that the originals themselves might not be saved. One can say with considerable con-

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confidence that the task of preserving the text of the physically deteriorating woodpulp files of domestic newspapers will be successfully carried through with microfilm although the task is by no means completed. Microfilm copies have already been made of most of the more important metropolitan files, and active planning is under way toward the preservation of many regional and local papers. The task has been and still is immense. The acquisition of large masses of manuscript and archival material from Europe, while enriching Western scholarly resources, has also clearly had as a major objective the reduction in the risks of total loss of such source materials through war, though it would appear that microfilms in Washington are probably about as vulnerable today as the originals in the Public Record Office, and perhaps even more vulnerable than originals in Cambridge, England. Nonetheless the more widely copies can be scattered, the greater are the chances for textual survival.

To date, the chief uses of microfilm in preservation have been directed toward the reproduction of woodpulp newspaper files and the duplication of unique originals which might be subject to wartime loss. We must recognize that the deterioration of woodpulp paper in monographs and serials will present a sustained problem to research libraries in the years ahead. It would now appear likely that the large research libraries, at least, will need to set apart a percentage of their budgets for the reproduction of deteriorating originals just as they now set apart a portion of their budgets for binding. To select items in time to make satisfactory reproductions before disintegration has gone so far that copying will be prohibitively expensive is a part of the problem. A number of organizations, including the Association of Research Libraries and the Midwest Inter-Library Center, have given some attention to the possibilities of cooperative efforts in the solution of this problem. Thus far, these efforts do not appear to have been particularly successful.

While archival organizations have made extensive use of microfilm to save space, research libraries have not yet gone far in this direction, though they have been duly grateful for the space saved through newspaper-salvaging operations. A recent effort directed essentially toward savings in space and binding costs has centered around the microfilming of current periodicals. The microfilms are sold on a subscription basis only to subscribers to the original paper editions, with delivery of the microfilm copy usually at the end of the volume year. It is probably too early as yet to judge how successful the use of such microfilm copies will prove in different kinds of libraries.  

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Microfilm is not, despite all its virtues, entirely without fault or limitation. To the contrary, it has some serious ones. In the first place, very few readers indeed would willingly choose to read by means of a projector if they could get the original. The psychological objection to reading with a machine is very real and must be recognized. It suggests that libraries should do all they can to make the use of reading machines as comfortable and convenient as possible. This in turn means that libraries must have available the best possible reading equipment and enough of it to meet the demand. Such equipment is not cheap; good microfilm projectors today range in cost from around $300 to over $600.

A good, small, portable, inexpensive reader has yet to be designed and made available. Most of the small readers that have heretofore been available have been more or less unsatisfactory in image quality and film transport. This deficiency has placed a limit on the use of microfilm by the individual scholar and has tended to keep the process essentially an institutional operation. This is unfortunate, for microfilm, potentially at least, could be of very material assistance to the private individual building his own reference and working collection—if he could only use it conveniently at home or in his office.

Many persons have objected to the use of rolls, and the manual dexterity required to thread film through a microfilm projector has seemed a nearly insuperable obstacle to (a) individuals who did not want to use the microfilm in the first place, and (b) individuals who constitutionally have six thumbs. The difficulty is real, but it can easily be exaggerated. It has been observed that graduate students who have, in effect, grown up with microfilm seem to have little difficulty in threading the reading machines and do not seem to suffer eye strain where good film is being used in good projectors.

In addition to these more or less mechanical difficulties, there are some others of greater weight. Where textual comparisons are important elements of a study and all the texts are on microfilm, the investigator faces a very awkward operation. Ideally, he would surround himself with as many projectors as he had texts, but this is usually well beyond the resources of the scholar and his institution. Similarly, bibliographical analyses, where signatures, leaves, state, ink, paper, binding, and watermarks are elements of the study, are hardly possible with microfilm copies. Even so, we must recognize that for most research needs the text itself is the goal, and the text can usually be faithfully and legibly reproduced by microfilm—and sometimes the legibility can even be improved.
The cost per page, if more than a few pages are involved, will be the least of any of the processes described, ranging, for negatives, from less than one cent in long runs to two or three cents per page for ordinary materials. Since microfilming is a photographic process its costs are commonly thought of as linear, i.e., the tenth copy will cost as much as the first and the hundredth will cost as much as the tenth. This is not precisely true, for the original negative cost is always higher than a copy made from it. The negative may cost anywhere from two to as high as five or six times the cost of a positive. Positive microfilm copies can be made on high-speed continuous printers and mechanically processed so that their costs may closely approach the costs for film stock, chemicals, overhead, and a small labor cost. This relation between negative and positive cost has been a strong inducement to make many larger microfilming projects cooperative ventures in which a number of institutions would share the cost of the negative and each secure a positive. The result has been the undertaking of a good many projects that might well have been impossible otherwise, but it has also meant a wider distribution of microfilm copies than circumstances of need (since a copy could always be secured later) sometimes really required. There is some current tendency for the larger research libraries to devote their resources to filming more original material and to acquiring fewer copies, deferring such acquisitions until an actual need arises. There are also a number of moves toward the cooperative use of microfilms and the extension of interlibrary lending of films. Thus the Midwest Inter-Library Center has arranged to secure microfilms of about nineteen domestic and forty-seven foreign newspapers for the joint use of member institutions.

There are two other widely known processes that require discussion with the microreproductive techniques, namely, microprint and microcards, which have certain characteristics in common. They both begin with a microfilm made more or less conventionally. In the case of microprint, however, the microfilm leads to one hundred pages of microtext printed in ink on one side of a sheet 6 x 9 inches. In the case of microcards, the microfilm is stripped out in such a way as to permit contact prints on a special, fine grain, high contrast photographic paper, measuring approximately 3 x 5 inches in size. The number of pages to the card is allowed to vary, depending in considerable measure upon the original reduction ratio used in making the microfilm, but it would appear that the number is likely to range between thirty and fifty pages of text on the majority of cards. Both processes have
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an appeal over roll or strip microfilm in the ease of manipulation of a flat card or sheet as compared with the threading of a projector with film.

Microprint has been principally devoted to very large scale projects on a subscription basis. While the technique itself is not limited to large scale projects, the process clearly requires an edition, and in this sense it is to the advantage of the Microprint Corporation to organize sustained and large subscription projects insofar as they can do so to avoid the handling of separate titles. The best known of the projects of the Readex Microprint Corporation is the reproduction of the British House of Commons *Sessional Papers* for the nineteenth century, sponsored by a committee of the American Historical Association and involving about six thousand volumes of four million pages. More recently the Readex Microprint Corporation has announced a project for supplying in microprint form on an annual subscription basis non-depository United States government documents. The costs per page of text have thus far been somewhat below the probable costs of microfilm for the same material, and the 6 x 9-inch sheet is undeniably easy to store and place in the projector. There has, however, been criticism by librarians of the relatively poor quality of the projected image. Any opaque reflection process from paper has technical difficulties in the production of a bright image on a screen that can be much more easily overcome in projection from a transparency. The problem is to get sufficient light reflectance from paper to illuminate a large screen with adequate contrast and at the same time not burn up the opaque paper medium carrying the image. These problems, in the judgment of the present writer, have not yet been fully solved in the microprint process, but Albert Boni, President of the corporation, has announced a completely new reading device, greatly superior to the former models.

Thus far, at least, it is evident that microcards also have served primarily for the republication of materials in edition quantities. Microcards have been developed by Fremont Rider through the Microcard Foundation. The Foundation has established standards of format and style and has largely centralized the actual manufacture of cards, but approximately twenty different persons, firms, or organizations have sponsored microcard production and sales. There appears to be a rather wide range for the cost of cards—from a low of about 25 cents to a high of around 60 cents in some instances. The rate appears to vary with the source, being lowest for works sponsored directly by the Microcard Foundation, rather than with the number of pages or
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the kind of text. While microcards have been used for a great diversity of material, including short single titles, there has been a tendency to emphasize major projects such as files of important reference works or serials of which the *Annalen der Chemie*, 1832–1943, with 5,043 cards, and Beilstein's *Handbuch der Organischen Chemie* with 965 cards, are illustrative. The use of microcards for short-run titles is illustrated by the publications of the Early English Text Society and the Hakluyt Society which are available en bloc or individually. An important application of microcards to publication involved the distribution by a special form of microcard of a series of technical reports from the Office of Naval Research beginning in 1951.4

A number of different projectors have been developed for microcards in which the manipulation of the card is simple and the quality of the image has been generally fair to good. Costs appear to be close to those for microfilm in similar editions and in some instances may well be higher.5 The requirement that all microcards be 3 x 5 inches has seemed an arbitrary limitation. An examination of the publications issued under the auspices of the Microcard Foundation6 would indicate that a card size which would accommodate text equivalent to that held on three to perhaps four conventional microcards might significantly reduce the number of cards per title that have to be filed, pulled, and inserted in the reader, then refilled, without too much loss in sensitive paper.

It is evident that at the present time neither microprint nor microcards is capable of producing economically either single copies or very small editions. When such needs arise one must turn back to the reflex contact copying processes, photostat, or microfilm.

There are a number of other processes or techniques that should be mentioned, even though they are not in general use at the present time. Among these, sheet microfilm in one form or another presents interesting possibilities. It is apparent that projection from a transparency is a less difficult optical problem than projection from an opaque medium. The opaque media that have been developed in sheet and card sizes, on the other hand, have a manipulative simplicity that is attractive to many people in comparison with long rolls of microfilm. The question, therefore, naturally arises as to whether sheet microfilm offers possibilities not now attained by the opaque or roll media. Sheet microfilm has been extensively developed and is in active use in a number of European countries. A common process relies upon a special camera in which multiple, stepped exposures are made on a negative film from which as many transparent copies
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as are desired can be printed by contact on silver sensitive emulsions or diazo impregnated plastics. Such techniques, for reasons that are a little difficult to explain, have not received widespread experimental or practical applications in this country. It may be because the labor costs in copying and processing the sheet films are likely to be considerably higher than those for roll film which can be mechanically fed into a camera very efficiently, which can be processed continuously in automatic processing equipment, and from which positives can be made on continuous printing equipment at high speed.

An alternative to sheet microfilm is the mounting of short strips of 16- or 35-mm. microfilm in transparent envelopes or in slotted cards. The cards can carry indexing and other bibliographical information in full size, and manipulation is simple. Some considerable development along these lines has occurred in this country, Filmsort Inc. of Pearl River, New York, being one of the pioneers. It is possible that further experimental work along these lines might be very fruitful, for the card with inserted microfilm has the great advantage of storage and manipulative simplicity and yet retains the single copy or very small edition advantages of microfilm.

Another microtechnique now on the horizon is a development of the Eastman Kodak Company which is also referred to as microprint. The Eastman Company is developing a line of equipment which will permit any organization to produce cards on opaque photographic paper from microfilm similar to those made by the Microcard Foundation. The Eastman 3 x 5-inch card differs from the Microcard Foundation card in carrying the bibliographical description of the text on the back of the card instead of on the face, and eliminates the traditional catalog card hole at the bottom of the card, thereby permitting around sixty pages of text to be placed on each card. The Eastman Kodak Company is developing a reading machine that will accommodate microcopies ranging from 3 x 5 inches up to approximately 8 x 10 inches in size. The distribution of equipment for making opaque microcopies in a wide variety of sizes will unquestionably broaden the area of users now served only by 3 x 5-inch cards from the Microcard Foundation and the 6 x 9-inch sheets from the Readex Microprint Corporation. The equipment is scheduled for availability by the end of 1954, according to the Eastman Kodak Company.

An entirely different technique of textual reproduction has made its appearance in the past two years under the name of Xerography, developed by the Haloid Corporation of Rochester, New York. This is
a dry electrostatic process with the final images formed on paper or offset paper plates by means of a very fine powder or vapor. At present this process lends itself very well to the preparation of masters to be run on conventional offset or multilith printing presses. It is less satisfactory where multiple copies are not required. However, the future development of the process may make it highly adaptable to direct single or short-run facsimile reproduction of textual materials.

Last in our list of processes, we should not overlook the photochemical and photomechanical processes of facsimile copying. On the whole these tend to be quite new and have not generally found their way into research library applications, but they should be watched with close attention for both current and future applications, particularly as they may improve the speed and efficiency in the interchange of research materials between libraries. The present costs of facsimile equipment are high, and the available equipment is not yet really well designed for research literature. Among the manufacturers with equipment in this field are the Times Facsimile Corporation with a facsimile process called Stenafax and the Western Union Telegraph Company with a facsimile process called Intrafax. The Atomic Energy Commission has had an experimental installation of textual facsimile equipment in operation at its Oak Ridge Laboratories developed by the Radio Corporation of America. Some years ago there was a public demonstration of a process called Ultrafax for the very high-speed transmission of textual materials using microfilm and transmission techniques closely related to those used in television.

In summary, we believe the major requirements of research libraries in relation to the various techniques of textual reproduction can be grouped into six distinctive areas: (1) Techniques of reproduction can increase the inter-institutional mobility of research materials and can also increase the convenience in use and accessibility of the individual investigator to locally available materials through very high-speed, very low-cost copying, a part of which may be in lieu of circulation. (2) The direct distribution to libraries and investigators of data and research findings, in certain microtext formats, may reduce the costs of publishing, speed up the distribution of research information, extend the possibilities in the diffusion of knowledge in highly specialized areas, and may simplify certain problems of use and bibliographic organization. (3) Microtexts, if a satisfactory, small, and inexpensive projector can be developed, may make possible once more, extensive, personal, scholarly collections—today a victim of high costs for subscriptions, books, and binding, and of insufficient space.
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(4) Microtexts will make important contributions to space and binding savings in research libraries, though these goals are likely to remain secondary to others of greater importance, and the position of the conventional book does not seem in serious jeopardy. (5) Reproductive techniques, and particularly microfilm, seem destined to play a vital role in the preservation of deteriorating originals and unique originals in danger of wartime destruction. (6) Photographic reproduction has important benefits in purely ancillary relationships to research literature. For example, microfilm is being used in the mechanization of bibliographical selection as in the Rapid Selector; photocopies are being used to improve the internal operating efficiency of research libraries; and infra-red and ultra-violet photography are being used as aids in the interpretation of medieval manuscripts.

It is evident from this discussion that some of the fundamental problems of research libraries, research-library use, and the diffusion of scholarly information are far from being solved. The problems themselves are growing in complexity as the bulk and diversity of the research literature increase. It is evident that while photographic reproduction will not solve all of these problems, it is now making, and is likely to continue to make, important contributions toward more satisfactory solutions. In appraising the contributions made thus far by the techniques of reproduction, we must recognize that, in relation to the time span of libraries and books, the period in which these techniques have been used is exceedingly brief. The growing diversity of the processes should be a cause for satisfaction rather than alarm, for out of a diversity of processes and techniques a far more versatile tool is likely to be forged in the next ten to fifteen years directed toward the efficient service of scholarship and investigation.

References

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ADDITIONAL REFERENCES


Restriction on the Use of Research Materials

LOUIS R. WILSON and JACK DALTON

This paper deals with some the problems connected with the examination and use of large bodies of materials in American research libraries today. It will consider manuscripts, archives, microfilm, and printed materials and touch upon the imposition of fees for the use of materials by graduate students and local and visiting scholars. It will not deal with restrictions incidental to interlibrary loan, with the censorship problem, or with the “more than 75,000 unpublished technical reports [the majority of which are security-classified] issued annually in this country by research projects supported by the Federal Government.”

The conclusions are based upon correspondence with, and questionnaire replies from, over eighty librarians and archivists of research libraries of all types, and upon careful consideration of the work of the committees of the American Historical Association and the Association of Research Libraries which resulted in the “Report of Ad Hoc Committee on Manuscripts Set Up by the American Historical Association in December 1948” and the “Report of the Committee on the Use of Manuscripts by Visiting Scholars Set up by the Association of Research Libraries.” These two committees, composed of three historians and three archival experts in the first instance, and of librarians and university professors in the second, provide such an excellent cross-section of informed opinion, and the problems they treat have such general applicability to this topic, that their reports will be considered at length.

The first of these committees was set up at Christmas 1948 to study the arrangement and use of recent large collections, the year 1900 being agreed upon as a satisfactory date for the beginning of the

Mr. Wilson is Professor of Library Science at the University of North Carolina. Mr. Dalton is Librarian of the University of Virginia.
“recent” period. The committee recognized that “While most archivists are considerate of the reader’s time and energy . . . a few place unnecessary and irksome obstacles in the reader’s way.” It was interested in making good practice known and in emphasizing the point of view of the reader who cannot easily find time, funds, and energy to use large collections. It recognized that any discussion of manuscript arrangement “should be preceded by the statement that each group presents a separate case,” that general principles could be recommended but that many exceptions would be found, and that judgment would be constantly required together with proper respect not only for the needs and wishes of the research scholar, but also “for the hard limitations (time, money, personnel) of most manuscript repositories.”

With these considerations in mind, it proceeded to make certain recommendations concerning arrangements, guides, acquisition policies, physical protection of manuscripts, qualifications of users, restrictions on the use of the content of manuscripts, facilitation of the use of collections, and protection of the researcher. The committee urged the importance of bringing valuable collections into safe repositories where they would be most available to the largest number of users. It recognized that “One of the chief functions of the archivist is the protection for posterity of an important source of future historical and biographical writing,” but pointed out that this function must be “balanced against the other important function of the archivist, namely, to make manuscripts as easily available to the user as is compatible with reasonable safety.”

Placing responsibility for proper use of manuscripts squarely upon the user, the report said:

It is up to the user, too, and his publishers, before publication, to obtain the necessary permissions from owners of the literary property rights in unpublished material. The problem of literary property rights is proving a thorny one wherever its implications are fully understood. These rights are a matter of common law. Consequently legal interpretations differ from time to time and from case to case. The principle is fairly well recognized that the writer of a letter or other paper retains the sole right to publish the contents of that paper, unless he parts with that right, and that the right descends to his legal heirs. But to what extent does this affect the repository, and, concomitantly, the user of manuscripts? There are many still unsettled questions in this connection—can public exhibition be considered publication, for example, or can photocopying be considered publication—which this committee cannot attempt to answer. The committee does recom-
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mend strongly, however, that further study of these matters be undertaken by scholars, archivists, and legal experts, to the end that some legally acceptable conclusions be reached and, if possible, some legal action be promoted to stabilize such conclusions; and that, in negotiation for the acquisition of manuscripts, the archivist make every effort to secure in that connection a dedication to the public of literary property rights held by prospective donors in any unpublished letters or other writings.

The committee felt that some sort of screening of applicants for permission to consult papers was desirable, and suggested the kinds of questions that should be asked by the user, but concluded by quoting the suggestive response of one correspondent who had said: “... all we require with reference to qualifications of prospective users is that we be convinced that they are trustworthy, intend to use the material for scholarly purposes, and are reasonably qualified to do so.” It pointed out that generally speaking archivists are considerate of a reader’s time and energy, occasionally other readers are thoughtless, “but the worst offender is apt to be a well-meaning staff member who cannot resist talking at length with readers, sometimes ostensibly to provide help.” The committee urged upon readers an effort to understand the difficulties many repositories face in the matter of hours, and urged repositories to make even greater efforts to adjust their hours to the needs of readers.

In the light of some recent discussion that has taken place among research libraries in this country, it is interesting to find “The committee suggests that it is of the utmost importance now and will be increasingly necessary in the future to permit the filming of large groups of manuscripts in order to make them available elsewhere. It seems important therefore to work out reciprocal arrangements between repositories whereby collections or parts of collections can be made available in two or several places with proper control retained by the original possessor whose responsibility it is to protect the papers against abuse.”

The committee recognized the vital importance of proper selection in training of staff members in handling manuscripts, and concluded its report with four special problems deserving recognition. This conclusion deserves full quotation:

In most cases the repository is not primarily concerned about protecting the reader. There are, however, four special problems that should be recognized. One concerns University libraries and the manuscript theses deposited in them before publication. In order to avoid
hard feelings and injustices, the committee recommends that such re-
positories of unpublished dissertations adopt the Harvard rule of
permitting no one to use these without permission of the author for
a five-year period, after which it would be reasonable to throw them
open for general use. The second concerns the policy, occasionally
imposed by a donor, of restricting the use of papers to particular
readers. The committee recommends against giving any reader a
monopoly in the use of papers. The third concerns the practice fol-
lowed by very few institutions—of permitting faculty members or
graduate students to earmark certain groups of papers and close them
to scholars from other institutions. If this practice were followed
widely, scholarship would shrivel up or be limited to the narrow
confines of each little bailiwick. Those who answered the question-
naire are, like the committee, unanimous in feeling that no retalia-
tion should be practiced against such institutions. This committee
does, however, deplore the practice of granting special privilege to
members of the owner-institution. Finally, the committee feels that
repositories can serve as important clearing houses of information
useful to readers by keeping and making available files that show who
is using each group of papers and the purpose for which it is being
used. Many an archivist has rendered invaluable service to readers
by bringing together those who have interests in common so that they
can discuss their subjects and exchange mutually helpful information
and material.

The committee of the Association of Research Libraries made use
of the Ad Hoc Committee Report, and its recommendations follow
closely those that have just been outlined. It seemed to this committee
that it was the duty of every librarian to encourage the proper use of
publications and manuscripts under his care, and to make his materials
readily available to qualified investigators, taking such steps as might
be necessary to insure their physical safety; that “The cause of scholar-
ship is best served by the Librarian building on strength in his own
institution, and directing to their proper home manuscripts which
would fit into or supplement strong collections in other institutions”;
that “When questions of analogous use arise the librarian should make
every effort to bring the scholars together in the belief that a con-
ference or correspondence will cause apparent conflicts to disappear”;
and that “The right of publication should be granted by the librarian
without reservation.” In this latter connection the committee recog-
nized “that university and college libraries have a special responsi-
bility to their faculty and students, and acquire manuscript material
for publication by a faculty member or a student working for the
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doctor's degree, and will therefore be obliged in *exceptional circumstances* to assign priorities in the publication of the manuscripts. The exceptional need for exclusive publication rights should be carefully considered and limited in duration (not more than three years), because priorities contravene the principles of liberal publication which the committee endorses."

The report concludes with further emphasis on the point "that restrictions on publication must not interfere with freedom of access, which should be, in effect, unlimited."

There can be no doubt that the attitude expressed by the Ad Hoc Committee Report is generally that of the archivists and curators of manuscripts throughout the country today. Letters received from eighteen archivists during the summer of 1953 state that they all follow in the main the procedures set up by the Ad Hoc Committee. These same institutions are by and large well equipped today to undertake microfilming or other kinds of reproduction of materials and are generally willing to reproduce upon request complete collections of manuscripts or archival materials relating to individuals, offices, industries, etc. No priority is given local residents in any of these agencies. This is equally true of such diverse large special libraries as the Department of Agriculture Library, the Armed Forces Medical Library, the Smithsonian Institution Library, the Department of Health, Education, and Welfare Library, the New York State Library, and the Union Theological Seminary Library.

With university librarians, the story is somewhat different. These are obviously anxious in the main to do all they can to help, but they differ considerably in their opinions about priorities and obligations. Answers to questions relating to the copying of large masses of materials for another library or the granting of priority to the institution's own faculty and students are likely to boil down to "It all depends on the situation." When forty-eight university librarians were asked "Does your library microfilm or reproduce in any other form complete collections of manuscripts or other special research materials for other libraries or institutions?" twenty said yes, twelve said no, and the remainder said "It all depends." Those who answered yes to that question were then asked "Does the library restrict the use of the material giving its own professors and students priority in its use?" Seven of the twenty said yes, eight said no, the others said "It all depends" or "The case hasn't come up yet."

When this same group of librarians was asked for personal reactions to supplying microfilm of complete collections and giving priorities to
the students and scholars of their own universities, a wide diversity of answers resulted. Some felt that only those items needed by an institution and its program should be accepted in the first instance, therefore the institution naturally had first claim; many believed scholars should be served on a first-come first-served basis; some believed that making such materials equally available to all comers would be like making an institution's laboratories and other facilities equally available to all visitors; some were skeptical of anyone's ability to pick the "qualified" user, although most recognized that some such effort had to be made; and there were combinations of these and other views.

It is not possible to generalize about these attitudes in terms of "have" and "have not" institutions. Some of the most liberal views and some of the most conservative views will be found among large and small, strong and weak institutions, and the various kinds of limitations imposed by some donors, in spite of the best efforts of the librarian, sometimes make it impossible for the most generous-minded librarian to be as generous as he might like to be. This, incidentally, is as true for the governmental libraries as for the private institutions.

To the scholar who is anxious to bring together in one place and at one time all the publications bearing on a given subject, there probably appear to be a considerable number of unreasonable librarians left and a fair share of restrictions to be found. There are still printed rules, and regulations, and will continue to be, but the scholar today enjoys virtually unlimited freedom of access to materials in American research libraries. Research libraries of all types make their materials available with as few restrictions as possible, even in the case of rare books. They are generous in permitting the use of materials through microfilm and impose very few restrictions except those that relate to copyright and the conditions upon which certain materials have been accepted. Their interlibrary loan practices are in many instances much more liberal than those described by the most recent A.C.R.L.-A.L.A. Code.

To be sure, one can still find petty and irksome regulations and rules governing loan periods, stack access, use of certain types of materials outside certain areas, and so on, which seem more appropriate to the period fifty or sixty years ago when certain institutions were still debating whether students should be allowed to borrow books and under what conditions than to the present. But this is nothing more than a kind of cultural lag. It is interesting to notice that it is this type of thing that the practicing scholar is likely to
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mention first when you ask him about the restrictive practices he has encountered.

More serious limitations than those imposed by the institutions are likely to be those that come through dispersal of collections and a lack of guides and calendars, in the case of manuscripts, and through delayed and inadequate indexing, in the case of serials and of local, state, and federal documents. The overwhelming majority of the documents published in this country each year are not properly indexed, and one has only to consider how much research is going on in government at all levels, and how much more is needed, to realize how paralyzing the virtual absence of bibliographical tools at the local government level and the inadequacy at all levels can be. The humanist and the social scientist have never had adequate guides to their materials, and this severe limitation remains.

As for microfilm, laboratory facilities are generally taken for granted in large research institutions today, and in those few instances among research libraries where microfilm facilities are not available, steps are being taken to make them available on the premises or in the vicinity. It can also be said that the tendency today is for the research library to lend film freely with a minimum of red tape.

It seems very clear that research libraries are not disposed to charge visiting scholars fees for their use. Thirteen of forty-eight university librarians replying to a question on this subject indicate that their institutions charged fixed fees for the use of their materials by graduate students who had completed their course requirements for advanced degrees but who were at work upon their theses. Frequently they made a distinction between those who use the library only and those who use the library and consult their professors. These fees, generally nominal, but occasionally quite high, are ordinarily collected by the business office.

The directors of the Harvard University libraries and the Columbia University libraries and one of the authors of this paper contributed to a College and Research Libraries symposium entitled "Fees for Research Library Use by 'Outsiders'" in October 1952. The discussion of the problem revolved around the fee system now in force at Harvard's Widener Library (and at Widener alone among Harvard's libraries) and included statements on the situation at Harvard and Columbia. L. R. Wilson, commenting upon the question "Should Research Libraries Impose Fees Upon Visiting Scholars?" saw no objection to the fees imposed by Harvard upon local residents but pointed out that charging visiting scholars fees sets an example which might...
be followed by other research libraries and poses a threat to the comity which exists among American universities. That symposium should be examined for further observations on some of the opportunities and obligations of great universities.

It should be pointed out that some librarians in the immediate vicinity of Harvard have expressed sympathy with the Harvard plan and have found in it direct benefits to their own libraries in that their institutions have found it essential to build up the resources of their libraries and make them adequate for teaching and research purposes. They have expressed the view that, properly understood, the fee system now in operation is neither objectionable nor likely to restrict productive scholarship.

How does all this compare with the situation in the nineteenth century or early in the twentieth century? Perhaps one or two typical situations will be sufficient to recall the earlier periods. In many institutional histories are situations paralleling that at the University of North Carolina, where from 1844 to 1868 all of the university’s historical manuscripts were in the home of the president. Upon his death, the administrator ruled that the papers were the property of his estate. From 1875 to 1900 the university’s papers were in the office of the major professor of history; in 1907 a vault was built in the Carnegie Library to house the papers, still without catalog or facilities for their use. Only in 1929 with the erection of the present building and the establishment of the Southern Historical Collection in 1930 were the manuscripts properly arranged and made easily available through the necessary guides and calendars.

Developments have been equally rapid among the public archives. A portion of a letter from one state archivist queried on this point tells a typical story:

I would say most assuredly that regulations for the use of materials have become more liberal since the first quarter of the present century. In our own case we have very few restrictions whereas earlier in the century we followed those then in vogue. For example, at that time letters of introduction were required as well as advance notice of the arrival of anyone desiring to use any extensive quantity of manuscripts. Furthermore, at the beginning of the century much of our work was limited to genealogical inquiries from individuals desiring to become members of patriotic societies. Since that time archival administration in our State has expanded so that we not only have the care and custody of the old records of state agencies but also those of counties and municipalities. We, also, serve as public records ad-
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ministrators in order to be assured that records being currently created will be properly taken care of for posterity. The enlarged facilities and staff we have greatly increases the amount of work done previously with the result that scholars are finding our holdings to be more readily available and much more valuable to them.5

And so it is with books and other materials. Everywhere it is obvious that there have been tremendous advances in the freedom and ease of use of all forms of materials, advances which are the result of better organization of materials, more and better-trained people, more space and improved equipment, increasingly numerous indexes and guides, and a better understanding of the needs of students and scholars.

References


Spatial Problems in University Libraries

KEYES D. METCALF

This article will emphasize the financial side of the space problem. The reasons for doing so are that it has been neglected in the literature so far, and that it is the key to intelligent attack on a number of other aspects of the problem.

What is the space situation? Why is it so important? What should be done about it? Let us deal first with the question of what we use space for, then consider what our needs for space are going to be in the years immediately ahead, and finally discuss what can be done about it. We are inclined to think that space in libraries is used primarily for storing books. This is not the case, except in a very few endowed institutions that have unusually large book collections and a comparatively small number of students. Most university libraries use considerably more space for readers than for books. Also, in addition to space for books and readers, there must be space for the staff, the catalog, entrance lobbies, corridors, stairways, exhibitions, and many other uses. But in too many libraries space is consumed because the building is a monument as well as a library (or even a monument and only incidentally a library), or because of poor planning. In some libraries as much as half the cubic footage may be wasted in this way.

Building-cost statistics are generally given on the basis of so much per cubic foot, or so much per square foot of floor space. It would be better, if we could agree on a reasonable definition of the terms, to use as a base the cost per volume housed satisfactorily and per reader cared for comfortably. There are too many reading rooms with chairs for six readers at tables that are only six or seven feet long and three feet and even less across, and with narrow aisles between the tables. With accommodations of this sort, students will not fill all the chairs, even if they have no other place to go to study. They will do their work elsewhere, or, more likely, they will not study at all.

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A second group of problems involves what we call the modular system of construction. Briefly, this means that the interior of the building is supported by columns instead of bearing walls, and is made up of a number of modules identical in dimensions. Arguments for this system are that the total cost per square foot or cubic foot is reduced because of simplified and thereby cheaper construction, and, more important, that complete flexibility is obtained, because all modules are alike and can be used for any purpose, now or later. Objections are more complicated, but are based on three facts:

1. That no module is perfect in size for all types of use.
2. That the system tends to produce a not quite first-class building because no part of it, being all a compromise, is perfect for any type of use.
3. That the architect and the librarian, in planning a modular building, tend to fall back on the fact that the building is flexible, and consequently do not plan ahead in sufficient detail. Actually the system requires more rather than less thorough planning for the most satisfactory results.

The disadvantages of the modular system have been stressed because, in this writer's opinion, its advantages have been overemphasized. Nevertheless the modular building is, rightly, here to stay. It is suggested, however, that advantage be taken of its good points, economy of construction and flexibility, that through careful planning the space may be used as well as possible, and finally that consideration be given to the use of other plans in the parts of the building where the modular system has obvious and unavoidable disadvantages.

While stair wells, corridors, and lobbies should be held down to a reasonable size, the importance of a good communications system should not be forgotten. Savings had best come by avoiding monumental stair wells and lobbies, not by reducing them to a size that will cause congestion. Corridor and lobby space can be used for multiple purposes; for example, as an exhibition area or even for the shelving of heavily used books. A wide corridor with exhibition cases on one side and books for assigned reading on the other may give a spacious effect for the library as a whole and yet at the same time save space.

Space for monumental purposes poses particular difficulties. If a monumentally inclined donor can be made to realize that his money might be used to such better advantage that it will add years to the life of the library and thus to the period during which his name will be
attached to the building, he may be prevailed upon to moderate his requests. The monumental portion of a building takes up space; it may also result in unsatisfactory internal arrangements, which are equally serious.

Workroom space is often the first place where a library building is outgrown. This may come from modesty on the part of the librarian, but sometimes simply from poor planning, which makes it difficult to use effectively all the space assigned.

Space for catalogs is often a serious problem. If an addition is made to the bookstack later on, a much larger catalog than originally required may be needed, and there may be no place to put it. The users of the catalog when the collection is small may take up much more space than the catalog itself, but as it becomes larger, the problem is to find room for the number of catalog drawers required, and the space for readers may be reduced proportionately. Consultation tables and their location are of great importance. Flexibility is increased if catalog cases are made in small units.

While bookstacks generally have less waste space than any other part of a library, they are not always well planned functionally. The arrangement should be as compact as possible to save steps and construction costs, and at the same time designed so as to make it difficult for the reader to lose his way. This point has not been given sufficient attention. Stack manufacturers and librarians have urged that no stack range should be more than ten sections, or thirty feet long, but a longer range may result in a stack that is less confusing and easier to use. If the stack can be so constructed that the main center aisle is immediately adjacent to the stairs and elevators, with only one range on each side of it, it is very much easier for a reader, or a staff member for that matter, to find his way about.

The largest part of almost every library today is used for readers. It is here that the greatest amount of space is lost, and that planning has been confined too largely to appearance and too little to making satisfactory and economical accommodations. In the past, height was required in our great reading rooms to obtain outside light and adequate ventilation, but the higher the room, the greater the difficulty of providing good artificial light, required about half the time most libraries are open. It is now possible, with modern lighting and air conditioning, to plan a reading room with a nine-foot ceiling and with less than twenty-five square feet per reader; experience has shown that reading areas up to 25 x 54 feet can have ceiling heights as low as 7 feet 8 inches without seeming oppressive.
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Large reading areas should be kept to the lowest possible limit. What might be called semiprivate accommodations as close to the books as possible are to be preferred. This can be done by alcoves, by what are known in the Princeton Library as "oases," or by cubicles or carrels, known at Harvard as "stalls." To save space, stalls should always be placed adjacent to an aisle that is necessary for other purposes. Such a stall in a bookstack requires less than one-third as many cubic feet of space as is required to seat a reader in a reading room two stack-stories high, and, for most readers, is more satisfactory. Some libraries have arranged to assign a stall to each reader, reserving it for his use only. If a reader is allowed to use any vacant stall, total space requirements are greatly reduced.

What are the needs for space going to be in the years directly ahead? Assuming careful planning and the elimination of monumental buildings, three important questions remain: Will the library staff grow and require more workroom space? Will the student body grow, or the use of the library made by students increase because of changes in educational policy? Will the collection grow?

Library staffs have increased tremendously in the past generation, but there are indications that growth will level off in the future. With original adequate provision for the staff in a new library today, and a building planned with reasonable flexibility, there should be less difficulty here than in the past.

The provision of space for readers is more complicated and serious. For one thing, this space represents a larger percentage of the total library area; for another, library use depends on many factors that are difficult to predict.

When a new library is planned, provision should be made for any additional use that will come from better physical conditions and better service. It is amazing how use will increase with improvement along these lines. The fact that this point has not been thoroughly considered is one of the chief reasons for new buildings becoming inadequate in size in what appears to be an unreasonably short time.

In institutions that have already given up the textbook method of instruction, it seems doubtful that there will be a change in educational policy in the years ahead which will increase to any considerable extent the number of hours spent in the library by students, but in others there may well be a shift to assigned and collateral reading, and the use of their libraries will be bound to increase greatly. In the past, student enrollment has almost always increased more rapidly than was anticipated except in a few of the endowed univer-
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ities which put strict upper limits on the number of students admitted. Census reports indicate that there will be a considerable increase in the total number of young men and women of college age in the years immediately ahead. It is important to plan so that a greater number of students can be provided for later, either within the building as originally constructed, or in an addition to it, or elsewhere.

Now for the controversial question of the increased size of the book collections in our libraries. Fremont Rider’s stimulating book *The Scholar and the Future of the Research Library* showed that until 1938 the average college or university library had been doubling at the rate of once in sixteen years. Later statistics indicate that this rate has dropped. The increase, instead of being 4 per cent per annum compounded, is now well below 3 per cent in those of our large libraries which can be considered to have reached maturity, and it is likely to be gradually reduced even farther as the years go by.

There are many reasons for this reduction in the rate of growth of our great libraries. The most obvious one is that a 4 per cent increase cannot continue indefinitely in a world that is increasing only one per cent a year in population. Another factor will be the disintegration of paper on which printed matter is published. If 100,000 volumes a year are added but 50,000 old ones disintegrate, the net growth is reduced. Paper disintegration is a field of research that has been sadly neglected and must be studied more thoroughly in the years ahead. However, it may take another generation or two for disintegration to reduce growth drastically, and we are thinking of the immediate future, not the twenty-first century. We cannot plan our libraries now with only the latter in mind.

But there are other factors that will tend to slow up the rate of growth of our collections. One is finances. The expenditures of libraries cannot, over a long period, increase at a more rapid rate than the other expenditures of the institution to which they are attached without upsetting our whole educational applecart. Total library expenditures do not, of course, increase at exactly the same rate as the size of the collections. Nevertheless, there is an inescapable relationship between the two because of the increased space required by growing collections, and the increasing unit cost of cataloging and public service as size increases.

Another possible cause for a decreased percentage rate of growth in research libraries is the probable increasing utilization of microreproductions and other mechanical devices. These may result in a
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drastic change in the library picture as far as spatial needs are concerned.

In those large libraries which have reached maturity the geometric rate of growth in the past has been, is being, and will be reduced. Even if the former rate of growth should continue, a large part of the space needed to accommodate the increase will not be in central buildings but in less expensive, outside locations.

When a library has reached maturity (several of the divisions of the Harvard Library have reached that stage, and a half dozen other large research libraries in the country are now in, or are rapidly approaching, that condition), if its book collections increase very much more than 2½ per cent a year, the library is growing more rapidly than it should. When a library is large enough to occupy one-tenth of a university's building plant and to use 7½ per cent or more of the institution's resources, it cannot continue to increase the space it occupies or its current expenditures more rapidly than the plant and the expenditures of the rest of the institution are increased without in a comparatively short time throwing the whole educational program out of balance.

It will take time to reverse the present trend in university libraries. An institution planning a new building today should provide space for books sufficient to care for an increase in the book collections for twenty-five years at the present rate, and seating capacity for the anticipated increase in the student body during a similar period. But it is not too early to be thinking about 1980.

There are very few architects and very few librarians who are well prepared for the task of planning a library. Unless the architect's and the librarian's experience in library planning has been extensive and successful, they should bring to their aid an experienced library architect or an experienced librarian as a consultant; in some cases both would be desirable. It should be realized that planning a successful library building is a complicated problem that cannot be accomplished in a short time. It requires a tremendous amount of consultation between the librarian and the architect, the faculty, the students, and others concerned.

However well or poorly a building is planned, the time will come when it can no longer be expanded, either because of plot limitations or lack of funds, and a new central building is deemed impossible or undesirable. By that time it is hoped that we may have reached the period when it is accepted that a library (excepting large research
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libraries) can limit its growth by discarding as rapidly, or at least nearly as rapidly, as it adds.

In addition there are four other possible courses of action. The first is better use of space already available through improved reading-room arrangements or the use of compact shelving now available through a number of bookstack manufacturers.

The second is decentralization within the university. Most librarians will say that there is already far too much decentralization and that it is almost criminal to advocate further division. On the other hand, it still may be better than continuing to live in a building so crowded as to make good service impossible. It may also be better than spending millions for a new building that will prevent use of the income from the same millions for other library purposes. Finally, there may be collections that will be just as useful outside the central library as in it. For instance, in a large and physically decentralized university, two science collections might well be outside the central building, one for the biological and one for the physical sciences. Libraries of professional schools, such as medicine, law, divinity, education, possibly business and some others, can be detached. At Harvard it has been found that a separate library for undergraduates can be an advantage rather than a disadvantage as long as the central research collection is available to the students when needed.

A third method for providing for growth without a new central building is to arrange for cheap storage for less-used books. This may be under warehouse conditions near at hand. In a metropolitan area, it may be in a cooperative storage building, such as the New England Deposit Library in the Boston area. It may be a regional library such as the Midwest Inter-Library Center or the proposed Northeastern Regional Library. The regional solution should have the advantage of permitting the elimination of little-used duplicates. Whether or not a regional library should have a strong acquisition program for current material has not yet been definitely determined, but the Midwest Inter-Library Center is struggling with the problem on a fairly large scale with some hope of success.

Lastly, there is the proposal advocated by the former Librarian of Congress, Luther H. Evans, by which all but the most-used books in a subject for which the demand is slight are transferred to the library that takes special responsibility in that field. The scheme has much merit but before libraries can undertake wholesale transfers from one institution to another, the universities involved, at the highest administrative levels, must put their stamp of approval on the proposal. Uni-
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Universities must divide fields of instruction between themselves if their libraries are to divide fields of book collecting. At present, it will be easier to transfer the types of material Evans had in mind to a regional library than to what we are still too inclined to consider as rival institutions.

This leads to mention of two important cooperative acquisition programs already in operation: the lusty infant at the Midwest Inter-Library Center, and the Farmington Plan, a little older, but certainly still in its early adolescence. Cooperative acquisition, with a division of fields and with the understanding that books in one library can be readily made available to others through interlibrary loan or microreproduction, certainly offers one method of cutting down on demands for space.

In conclusion, it is important that librarians be ever on the lookout for new developments such as microreproductions, facsimile by wire, compact shelving, and architectural innovations that may help to solve their space problems. We never can tell when science will come to our aid.

Librarians must also remember that demands for space, unless better controlled than in the past, will result in a larger and larger percentage of the funds available to libraries being used for new construction and building upkeep. Space demands should be held down as far as possible without interfering with the primary purpose of research libraries, which is the furthering of research with the written word. If an existing library is reasonably satisfactory except for book storage, careful consideration should always be given to the question whether the new construction will be more useful to the library than use of the same funds for other library purposes.
The one clear trend that has developed in the field of exchanges during the past thirty years or more can be discovered by consulting Library Literature. During the quinquennium 1926–30, according to that bibliography, only 13 pages were printed on the subject of exchanges, an average of 2.6 per year. For 1936–40 there were 107 pages, or 21.4 per year. For 1946–50 the figure is 899, or 179.8 per year. Since 21.4 is 823 per cent of 2.6, and 179.8 is 840 per cent of 21.4, the geometrical rate of increase appears to be reasonably constant. If fractions are disregarded and the increase is described as only eightfold, the situation can be summarized by stating that the output of printed material on exchanges is doubling in quantity every three and one-third years.

Many persons now studying in library schools can expect to be alive during the years 2006–10, when, if this trend should continue unchecked, more than 100,000 pages about exchange will be pouring from the presses every day; it may be feared that production of literature on the subject will then leave librarians little time to engage in the practice of exchange. Geometrical growth of libraries—even if it threatens to make them dwarf the Pentagon or absorb the universities they now serve—may be indicative of a growth in value and importance that has its gratifying side. The annual production of writing on exchange, however, though sixty-four times as voluminous as it was twenty years ago, does not seem to have increased correspondingly in value of content, and the prospect of further dilution might be considered alarming.

Though international exchanges account for a large proportion of the total literature, it is not difficult to point out those publications that will serve as adequate guides to this area. The Princeton conference volume attempted, in effect, to provide an annotated bibliography of significant works antedating 1946.¹ The report by Laurence J. Kipp,² though primarily concerned with governmental pro-

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grams for exchange between the United States and Latin America, is a valuable aid to investigation of almost any aspect of international exchanges involving American libraries. The Unesco handbook summarizes developments in international exchange for the years 1939–49 and lists and describes exchange centers, treaties, and conventions; it also offers information on transportation and customs. A new edition is planned for 1955, and in the meanwhile the Unesco Bulletin for Libraries serves as a monthly supplement.

The international exchange of government documents is covered so well by the sources just mentioned that it need not be considered here at all. The subject of barriers that impede international commerce in library materials is also treated at length in these sources and in a separate manual issued by Unesco; it would seem inappropriate to discuss barriers here in any case, because nearly all of them affect purchases and gifts as much as exchanges.

The growing volume of exchange literature may reflect a considerable increase in the number of publications exchanged, but there seems to be no convincing evidence that this is so. Indeed, it has been pointed out that the establishment of university presses has tended to diminish the amount of material that is available for exchange by university libraries, and another source of supply is drying up as fewer and fewer universities require publication of theses. Newly independent nations, on the other hand, may have a great bulk of material to offer and may also develop more effective methods. "India," it is asserted, "has no hampering tradition in the matter. It can organise its exchange on the most rational lines, make experiments and improve it with far greater freedom. India has not got any of the ideological or constitutional handicaps which got developed a century or two earlier. It is therefore possible for India to set up and practise the ideal standard in this form of international relation and be a model to other nations."

The exchange of current publications—usually exchange by a library of publications issued by the institution to which it is attached—is undoubtedly more extensive than exchange of duplicates at the international level. As a means of encouraging it, Unesco has listed series currently available for exchange. A possible objection to lists of this sort is implied by questions that Errett W. McDiarmid suggested for discussion at Princeton: "Is there a tendency to acquire material on exchange simply because it is available and seemingly inexpensive? . . . What would be the effect of a great volume of exchanges on the book selection policies of libraries? Might it not result
in libraries’ acquiring the things others want them to acquire rather than those they need? Good bibliographies enable libraries to select what they need and propose exchanges in cases that seem appropriate; but lists devoted to exchange materials alone may sometimes, presumably, increase the temptation to neglect those series that can be acquired only by purchase.

Materials contributed toward the rehabilitation of libraries in war-devastated countries were allocated by national clearinghouses, and a few of the national exchange centers attempt to handle all international exchange receipts in the same way. There are theoretical advantages, but it is doubtful that institutions with successful exchange programs will agree. A recent article states that the “Uppsala University Library decisively rejects the idea of transferring its exchange work to a special exchange centre,” explaining that postage would not be saved because the library already has franking privileges, that the library would not wish to share material exclusively at its disposal, that the center would not save labor but would be unwieldy, that both donors and employees are more interested in exchanges directly affecting their own institutions than in “an abstraction like an exchange centre,” and that direct exchange has created considerable good will for the library internationally.

Most projects for the exchange of duplicates have been primarily domestic rather than international, though the Unesco Bulletin for Libraries lists wants and offers, and some national centers carry on a heavy international commerce. Exchange of duplicates, it should be emphasized, is a very different problem from exchange of current publications, and arguments against centralization in the latter field do not necessarily apply to centralization of duplicate exchange.

An interesting discussion is reported in the proceedings of the Philadelphia Conference of Librarians in 1876:

MR. BARTON called up the subject of duplicates, and how we can make the best use of them... 

MR. VICKERS hoped that the LIBRARY JOURNAL would be able to furnish an opportunity for effecting exchanges hereafter, by giving lists of duplicates.

MR. BARNWELL thought that even if the JOURNAL was made accessible for this purpose, the labor of making the lists would prevent its being generally used... 

MR. DEWEY... thought the best method, if it were practicable, would be to turn all duplicates into a common depository, and then contributors could draw from that source, the manager of the de-
pository giving credit for all books sent in, and charging all drawn out.10

Experience has accumulated since 1876, but the best method of dealing with duplicates is still debatable, and Dewey’s opinion is at least as tenable as it ever was. Many kinds of duplicate exchange organization have been established, and many are still in existence. One possible classification is by geographical scope—local (as in Philadelphia),11 state (like the one established in Albany by Melvil Dewey12), regional (as prophesied by Robert B. Downs, who has predicted that national efforts will prove abortive13), national, and international (like the Pacific Exchange Center recently established in Honolulu14). They may also be classified by method of operation. Some, like the Duplicate Exchange Union of the Association of College and Reference Libraries,15 merely systematize the circulation of lists of duplicates. Others, like the British National Book Centre,16 act as clearinghouses for lists of wants and offers that are sent to them. Still others, like the United States Book Exchange, collect duplicates and fill orders.

Some duplicate exchange organizations are limited to libraries specializing in a single subject such as law or theology.18 The exchange operated by the Medical Library Association, which has been described by its Manager as “the most wonderful institution of its kind in the world, and the most successful ever tried,”19 has a long experience that illustrates interesting problems. Its altruistic nature has been emphasized: “. . . there is still too much of the feeling to ‘give something and get something in return for it.’ This can never be the case in the Medical Library Exchange because the large libraries must give largely and receive very little, while the small ones receive much and give but little.”20 It was once estimated that “The large library should, normally, give ten times what it receives.”21 Trading outside the exchange by members has been denounced as reprehensible—a “‘get-rich-quick,’ greedy method.”22 Libraries were given priority in the order of their size until 1948, but there were difficulties:

The assigning is the most difficult and heartbreaking part of the Exchange work. We want so much for everyone to have what they need, but it is quite impossible. . . . We know that the constitution says assigning shall be by the size of libraries, the largest libraries to receive their requests first. The provision would work much better in reverse, and would be much more logical, for the larger [the] library, the less it should need from any duplicate list, if the large libraries played fair, for the constitution also states that no library
shall ask for a duplicate of what it already has on its shelves without stating that it is for a second set. . . .

Size of libraries should be a guiding principle, but it cannot be the final word if complete equity is to be maintained.19

Under the new system, two plans are used alternately. Distribution of one lot starts with the library that ranks in size immediately below the one offering the material and proceeds down through the list, reaching the largest library in the exchange only after the smallest has been passed; distribution of the next lot starts with the library that ranks in size immediately above the one making the offer and works up through the list, reaching the smallest libraries only after the largest have been given a chance.23

Establishment of the United States Book Exchange is undoubtedly the most important event in American exchange during recent years, but it is not quite accurate to describe this exchange as "a new idea."24 Dewey, it was noted, had something much like it in mind by 1876; he advocated it again in 1880, asserting that "If it wont pay to do the work in the cheapest way, it certainly wont pay to do it at all."25 By 1930 he admitted that he had been ahead of his time a generation ago (a long generation!) but still believed that, sooner or later, someone would start a nonprofit center to which duplicates would be shipped.26 Eighteen years later the American Book Center for War Devastated Libraries, Inc., gave birth to the exchange; a profusely illustrated booklet has recently told the story of the parent organization.27 A monthly Newsletter has been issued by the United States Book Exchange since February 1948.

The organization accepts for exchange credit unsorted and unlisted lots of "monographs in science and technology published during the last ten years, or those published in the humanities, the arts, or history during the last fifteen years, as well as recognized classics of older date. There is no date limit on periodicals, which are acceptable in the same fields, both scattered issues and long runs."28 Lists, arranged by language or country, are distributed regularly, and requests for any publication that the exchange might have or might later acquire may be submitted on forms that sell for ten cents each. A library receiving material from the exchange pays shipping charges plus handling fees ranging from ten cents to one dollar per item.

Establishment of the United States Book Exchange has not prompted other organizations to abandon their exchange systems, and lists of offers by individual libraries are still received in large numbers, even in institutions that customarily disregard them. Since doubts
that such listing is profitable have been expressed repeatedly from 1876 on, and since a national clearinghouse was often advocated as the ideal solution for the problem of duplicates, the present situation, at first glance, may seem surprising. Perhaps it can be explained by consideration of underlying causes that have prompted library exchange.

The Kipp report, noting that interlibrary barter may seem an anomalous survival in a civilization that normally uses money for commercial purposes, acutely diagnosed the advantages of library exchange as falling into three classes: economic, bibliographic, and psychological. Many of these advantages result from conditions that are clearly pathological. Inadequacy of library book-budgets has often been cited as a stimulus to exchange; during the depression, when it was “sometimes easier to get added N.Y.A. [National Youth Administration] help than an addition to the budget,” a considerable impetus was provided by “the pressure of curtailed funds.” Since World War II a major factor in international exchange has been “the lack of dollar exchange coupled with currency controls in most of the other countries in the world, which makes it difficult for institutions in those countries to obtain current American publications other than by exchange.” The fact that satisfactory book dealers are not to be found in many countries may also be a symptom of economic morbid- ity, and the caprices of Soviet bureaucracy, which often make it possible to get on exchange material that cannot be purchased, are hardly healthy, though their causes may not be wholly economic.

Bibliographical deficiencies were largely responsible for the proposal that the United States Book Exchange serve as an agency for Farmington Plan acquisition of non-trade publications. (Efforts to obtain a grant to finance this project have not succeeded.) As the Kipp report notes, “A library normally finds it expensive to locate foreign titles needed, and additionally expensive to locate the bibli- ographic data needed for ordering through commercial channels. These steps are all the more expensive when the material needed is from a country where publications are not systematically listed. The need for such data is often eliminated through use of exchange. . . .”

The United States, however, has not been undergoing an economic depression since the war, and the other considerations that have just been noted apply to international exchange and to exchange of current publications rather than to domestic exchange of duplicates. Psychological factors remain as possible explanations of failure by the United States Book Exchange to supplant other channels. The Kipp
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report states that "The psychological advantage in exchange lies in the simple fact that individuals and institutions sometimes prefer to pay their own way, and exchange of talents or goods may be preferred to the acceptance of gifts." This is sound as far as it goes. On the domestic level, one can cite the extraordinary lengths to which a small library has gone in order to balance its exchange accounts, though reluctance to accept charity seems to have applied only to charity from other libraries, which were paid off with materials begged from individuals or commercial organizations. There remain, however, other and more important psychological factors.

Exchange may be regarded as an adventure with attractions that have been vividly described:

Have you traveled to the fascinating land of exchange? Its boundaries are limitless and the only passport requirements are your goodwill and your desire to help other libraries. Of course there are the usual vicissitudes of travel—correspondence, sorting and packing. It sometimes requires a stout heart to conquer the trials of locating gratis packing materials and an alert mind to unravel the mysteries of transportation rates, custom regulations and the other intricacies of travel. Be that as it may, those who have overcome these obstacles will agree with me that it is a never-to-be-forgotten experience—rich in satisfaction.

... My first voyage was on the good ship Von KleinSmid Library of World Affairs of the Los Angeles University of International Relations Line, administered by the University of Southern California...

... Many friendships were formed in the process. It takes little imagination to visualize the colorful backgrounds of some of the writers. ... Imagine my pleasure at being recognized after several years and a change in position by a British friend.

... Answers came from many different types of libraries; some very large and important libraries were among those that participated. This is one of the pleasures of exchange—you never know what library will be your next partner.

The Executive Director of the United States Book Exchange, though convinced that her organization's plan is more economical than any other, has stressed the fact that "it was and has been the ideal of the agency not to try to supplant or absorb such direct exchanges as have provided friendly intercourse and helped to strengthen cultural ties over the years." Still, such an organization can hardly avoid arousing some apprehension in those who value the personal relationships of which Flora B. Ludington spoke at Princeton:

I rather profoundly believe that exchanges between libraries that
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are arranged between library and library or librarian and librarian add to general cultural understanding more than they do in the operating of an agency. The mere fact that you have to write a letter, from one individual to another individual and probably have a continuing correspondence over a long period of years, I think, is a salutary thing, and we are living in a world that is too much built up around organizations. I think personal friendships, even though they have begun because of official position, nevertheless are very much worthwhile. . . .

We may not have seen our opposite number, who is the research librarian of some far-distant place, but we know his name through a long period of years, through an exchange of correspondence.87

On the other hand, friendly feelings may not always result from the offer to enter into such relationships. The voyager who reported that many friendships were formed also indicated that, of the sixty American libraries approached, only one-half answered in any way; she writes: "It seems that with the added hint of the enclosed stamped and self-addressed envelop that [sic] only great lassitude and distaste for exchange could account for the small number of those who responded." 35 Disillusionment with half of one's colleagues may be a high price to pay for contacts with the remainder.

It may also be feared that centralization is not the only development now threatening to reduce in number the personal relationships that result from exchange. A librarian at Columbia University, noting that form letters are becoming increasingly popular, has reported: "One of the characteristics of exchange work is the high volume of correspondence. By the use of form letters Columbia has effected an estimated saving in time of sixty-six percent with a corresponding financial saving." 38

Perhaps, however, forms need not have a deadening effect of impersonality, for another student of the subject has instructed his readers: "Preface your short and neatly mimeographed list of books or serials listed in correct bibliographic entry with a brief statement of conditions. . . . Add: 'P. S. We shall appreciate receiving lists of duplicates your library offers.' " 39 The mimeographed form, consequently, does not preclude the human afterthought; like national advertising, it may be artfully personalized.

Finally, the individual's profits from exchange are not confined to adventure or to friendship; there is an anodyne vision that transcends these. ". . . Every item secured through our Exchange is another building block in an invisible shrine that must now reach to the heavens," the Manager of the Medical Library Association Exchange has written.
"When you pay for something you did not order; when your shelves are so crowded you cannot squeeze in another thin journal; when the Exchange process seems inordinately slow; when your back seems broken by sorting out the assignments; and your arms and legs ache from carrying packages to the post office; let this beautiful shrine rise before your eyes, and know that you are adding more building stones which are higher than mortal eye can see, and the annoyances will pass, the aches mysteriously disappear." 19

Exchange, if it can offer this as well as adventure and companionship, evidently can be its own reward. The literature of the subject records no cost-accounting studies that would justify direct exchange of duplicates on a merely economic basis, but, if the practice fulfills needs that currency cannot measure, the results of such accounting might be irrelevant.

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8. Williams, op. cit., ref. 1, pp. 92-93.
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ADDITIONAL REFERENCE

Interlibrary Lending

CARL H. MELINAT

From the point of view of the research worker, it would be ideal to have his materials located all in one library. This is obviously impossible. No one library in the world contains more than a small part of the total number of printed books that have been published to date. And printed books comprise only a fraction of the materials which a research library needs to procure and store. Thus the necessity of interlibrary lending for purposes of research can hardly be argued.

The idea of lending books between libraries in the United States was suggested in 1876 by Samuel S. Green. The idea grew slowly in its application, and it was not until 1917 that the American Library Association felt it necessary to issue a Code of Practice for Interlibrary Loans for the guidance of cooperating libraries. This Code was revised in 1940 and again in 1952, by which time the system of lending between libraries had become almost universal. Today, the exchange of materials on loan goes on as a regular part of library business, and its operation is expanding yearly.

Printed books covering this phase of library operations are few. The standard guide for years has been Constance M. Winchell's Locating Books for Interlibrary Loans, and J. A. McMillen provides a bibliography up to the year 1927. The texts on college and university library administration, such as those by G. R. Lyle and L. R. Wilson and M. F. Tauber, cover the organization and administration of interlibrary loans in institutions of higher education.

The periodical articles of recent years would seem to indicate that librarians have been most concerned with matters related to cost and procedure. In 1932 C. H. Brown made a good presentation of the problems involved in interlibrary lending, with some concrete recommendations for their solution. Elizabeth Ferguson was concerned with public library problems in this field, but her ideas have general application. The relationship between the use of microfilm and interlibrary loans has been treated by H. H. Fussler.

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Since 1946 there has been renewed concern over the increased volume of interlibrary lending and the solution of some of the problems involved. The difficulties of the large university library are told by R. H. Haynes at Harvard and by Mary L. Lucy at Columbia. Some fresh thoughts and experimentation have come out of the University of Pennsylvania and are described in articles by C. W. David and W. W. Wright.

By 1950 we seem to have an "interlibrary loan crisis" which is described by Margaret D. Uridge. She outlines three suggested areas of investigation: (1) a study of costs, (2) a revision of the Interlibrary Loan Code of 1940, and (3) an investigation of work simplification techniques and routines.

The Association of College and Reference Libraries appointed a Committee on Interlibrary Loans, with William A. Kozumplik as chairman, to study these matters. Interlibrary loan costs had been the subject of many periodical articles in the past, such as those by Alan Holske and K. H. Koopman. It was J. G. Hodgson who made the first comprehensive survey of all the costs involved in lending books from one library to another. He found that in 1950 it cost, on the average, a little over a dollar to borrow a title and about half of that to lend one. Lending libraries are not now making a charge for this service. Fussler believes that the time may soon come when borrowing libraries should expect to pay a reasonable fee to the loaning library.

The exchange of material between libraries on a loan basis has been governed in a general way by an Interlibrary Loan Code. Harold G. Russell was chairman of an A.C.R.L. Interlibrary Loan Code Committee which prepared the 1940 Code officially approved by the A.L.A. Council. In 1949 C. H. Melinat made a study of the 1940 Code and recommended certain changes. Soon after, the A.C.R.L. Committee on Interlibrary Loans, working in cooperation with the Interlibrary Loan Sub-Committee of the California Library Association, formulated a revised and enlarged General Interlibrary Loan Code of 1952. This is now the official code of practice for American libraries engaged in interlibrary lending. Individual libraries, however, accept and operate under the code only on a voluntary basis. The American Library Association has neither the desire nor the power to enforce the provisions of the Code, but its official adoption contributes much toward the uniformity of practices among libraries.

The work procedures and practices involved in interlibrary lending have been investigated by K. J. Boyer and again by Ruth Harry and
Harald Ostvold, Melinat made an extensive survey of practice in 1949. The selection of the libraries to be surveyed was based on the assumption that the libraries most concerned with interlibrary loans and those which controlled the practices involved were the large research libraries. To this group were added representative examples of other types of libraries to broaden the scope of the survey. The selection included 45 library members of the Association of Research Libraries (two Canadian libraries and one research library, which did not lend books, were omitted); 23 university and college libraries which were actively engaged in research (selection based on a total of more than 35 doctorates awarded by the institutions over a seven year period); 21 college libraries selected as representative by Felix E. Hirsch for his study of interlibrary problems of college libraries; and 24 public libraries with holdings of over 500,000 volumes. Of the 113 questionnaires sent out, replies were received from 100 libraries and fell into the following groups: 50 university and special libraries, 30 college libraries, and 20 public libraries.

In borrowing books from others, the majority (62 per cent) of the libraries (unless otherwise noted, the percentages given are for the total sample of 100 libraries) surveyed follow the Interlibrary Loan Code plus their own regulations. Only 20 per cent follow the Interlibrary Loan Code without variation, and 16 per cent use only their own set of regulations. The university and college groups follow the same pattern as the total sample, but the public libraries tend to use their own set of regulations more frequently (45 per cent) and the Code less frequently (10 per cent). The same general pattern is followed by all libraries in lending books to others. The only difference is a slightly greater reliance upon their own regulations (19 per cent) with a corresponding reduction in the adherence to the Code without variation (15 per cent).

Most libraries have definite rules as to who should be allowed to take advantage of the interlibrary loan service. Almost three-quarters of the surveyed libraries indicate that they both borrow and lend books for the use of faculty members (78 per cent borrow; 74 per cent lend), Ph.D. candidates (65 per cent borrow; 72 per cent lend), and master's candidates (70 per cent borrow; 72 per cent lend). However, less than half report that they borrow (40 per cent) and lend (38 per cent) for undergraduates. Almost half (46 per cent) of the libraries borrow for any patron with a serious research purpose and almost three-quarters (72 per cent) lend to this group. Only one-quarter (26 per cent) borrow for any serious reader or student, while
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half (50 per cent) will lend to this group. Less than one-quarter (21 per cent) borrow for the use of commercial firms, but over two-thirds (69 per cent) lend to them. Only rarely will libraries borrow (2 per cent) or lend (9 per cent) for the use of a group of students. It is noted that libraries generally place greater restrictions upon their borrowing than on their lending. It should also be pointed out that both the borrowing and lending policies become more liberal as one progresses from the university to the college to the public library group.

Over two-thirds (68 per cent) of the libraries provide photostats, practically half (49 per cent) are able to supply microfilm reproduction, and only slightly over one-quarter (28 per cent) have no photographic facilities. University libraries are most likely to offer these services, next in order come the public libraries, and the college group has the least number of facilities. Libraries report that their provision of photographic services has not reduced the number of books sent out on loan. Only a few (15 per cent) replied that the services have resulted in a material reduction in the number of periodicals sent out. The reason why the general provision of photographic service has not resulted in a considerable reduction in material sent out on loan is clear upon examination of the conditions under which photographic reproductions are requested by borrowing libraries in lieu of the actual publications. Over three-quarters (77 per cent) of the libraries order reproductions when the actual material cannot be borrowed, slightly fewer (72 per cent) order when the patron wants a reproduction, and over half (54 per cent) are interested in reproduction when they wish to keep the material for their permanent use. Only one library indicates that it requests reproductions in all cases where the lending library offers the service; 10 per cent of the libraries order reproductions in very few or no cases; and 7 per cent have no microfilm reader and thus never order microfilm.

Every library restricts its borrowing and lending to certain types of materials. Libraries usually have fewer restrictions on the types of materials they will lend than on the types they will attempt to borrow. Libraries lend oftener than they borrow: books in print, individual volumes from sets, government documents, material of unusual size, and unbound newspapers. They tend to attempt to borrow oftener than lend: manuscript theses, unbound periodicals, valuable books, rare periodicals, rare books, reference books, and rare newspapers. As to the characteristic borrowing and lending policies of the three groups studied, the university libraries generally have the fewest re-
Interlibrary Lending

restrictions, next come the college libraries, and the public libraries have the most restrictions. In order to protect the authors of uncopyrighted manuscript theses, many libraries place controls on the lending of this type of material. Devices used include: providing a statement of the limitations of using uncopyrighted material (14 per cent), requiring user of thesis to sign a statement of use (13 per cent), and getting the written consent of the author before lending thesis (5 per cent). Almost half (44 per cent) of the libraries lend only duplicate copies of theses, and about one-third (34 per cent) have no special restrictions. The control devices are more generally used by university libraries than by college or public libraries.

Most libraries (87 per cent) indicate that they attempt to verify and complete all citations before sending out requests. As to the per cent they are able to verify, the majority report that it is between 90 and 95 per cent of the total. When unable to verify citations, only slightly over half (57 per cent) note that fact by, "Not verified." About two-fifths (41 per cent) of the libraries are satisfied that the citations as they come to them from others are verified and complete. Only 10 per cent report that citations generally indicate "Not verified" when that is the case. Almost half (47 per cent) of the libraries are not satisfied with the references sent to them. Slightly less than half (45 per cent) report that requests do not usually indicate "Not verified" even when that is the case. Almost one-third (31 per cent) indicate that there is general uncertainty as to whether citations have been verified or not. In general, university libraries seem to make a greater effort to verify their citations than do college and public libraries. University libraries also report the greatest dissatisfaction with the references as they come to them from others.

Although the borrowing library assumes all transportation costs connected with interlibrary loans, it often seeks reimbursement from its patrons for these charges. In some cases, fees are charged to cover the cost of the service rendered. Almost half of the libraries pay all costs of borrowing for faculty members (45 per cent) and others (40 per cent). Transportation costs both ways are charged by one-quarter (24 per cent) of the libraries to faculty members and by one-half (49 per cent) to others. A few libraries charge the cost of transportation one way to faculty members (5 per cent) and to others (4 per cent). The cost of photographic reproduction is charged to faculty members by over one-third (39 per cent) of the libraries and to others by almost one-half (44 per cent). A few libraries charge a service fee to faculty members (5 per cent) and to others (8 per cent). This fee
ranges from five cents to one dollar. More public libraries charge costs back to the patron than do college and university libraries. As to the reasons why libraries charge costs to the user, almost one-third (30 per cent) use the practice because the library budget would not cover the costs. A few (5 per cent) use the charges as a method of restricting the loans requested. Almost one-quarter (22 per cent) charge for a combination of the above two reasons. Public libraries seem to be more interested in charging to get their own costs reimbursed, while college and university libraries are more interested in a device to restrict the number of loans requested to genuine needs.

The major problems of borrowing libraries are reported to be the difficulty of finding out what library might have the material wanted (46 per cent), difficulty of getting patrons to observe due dates and other rules (21 per cent), amount of time and money spent on this service not being in proportion to the results obtained (17 per cent), reluctance of libraries to lend certain types of materials (12 per cent), inability to verify references (6 per cent), volume of borrowing increasing too fast (4 per cent), slow service on loans (2 per cent), detailed work of keeping records (2 per cent). Only a few borrowing libraries (17 per cent) indicated that they had no serious problems.

The major problems of lending libraries are reported to be unverified citations (55 per cent), unreasonable amounts of material requested by some libraries (29 per cent), unreasonable kinds of material requested by some libraries (16 per cent), heavy drain of this type of service upon the library budget (15 per cent), lack of information as to the purpose for which material is being requested (4 per cent), and reluctance of libraries to accept photographic reproductions instead of the material itself (2 per cent). Only one-quarter of the lending libraries (25 per cent) indicated that they had no serious problems. The university libraries reported more problems than did the college and public libraries.

It has been obvious for some time that the interlibrary loan routine followed in libraries is full of details, is time-consuming, and is expensive. The complexity of the routine can and should be questioned. The A.C.R.L. Committee on Interlibrary Loans, starting from a form used by the University of California, developed a multiple carbon interlibrary loan request form \^[24,25] which can result in about 50 per cent savings in clerical costs over older methods. These forms are now used by many libraries and may be purchased from library supply houses.
Interlibrary Lending

One of the most recent mechanical devices used to facilitate inter-library lending is the teletype. RACMIL, the coined word for teletype communication between the Racine and Milwaukee public libraries, was started in 1950. In 1951 the libraries of the Midwest Inter-Library Center joined the TWX teletype system, making it possible for them to call the Center and each other, as well as any other of the 29,000 teletype subscribers in the country, including the Library of Congress.

An interlibrary network of facsimile communication has recently been described by Scott Adams. While still in the developmental stage, this device offers great possibilities for quick transmission of exact, durable, and cheap copies of material from one library to another.

Mechanical devices such as Ultrafax (which is said to be able to transmit one million words per minute) and closed circuit television transmission offer unlimited possibilities for library application, but appear to be too expensive for extensive use in the near future. But the day will come when the delivery of a document from another library at some distance will take no more time than is now taken in getting a book from the stacks to the delivery desk.

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