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CONTENTS

	Page
The Chaplin Report: A Symposium. Edited by *Paul S. Dunkin.* Articles by *Paul B. Kebabian, David Remington, Milbrey L. Jones, Edith Scott, and Robert G. Krupp*	213
Measure of Indexing. *Susan Artandi*	229
Subject Indexing Mythology. *Bella E. Shachtman*	236
Serial Record Instructions for a Computerized Serial System. *Ted F. Syrgley*	248
Combined Procedures for Technical Processes. *Earl Farley*	257
Regional Groups	266
Equipment and Methods in Catalog Card Reproduction. *Joseph H. Treyz*	267
Library Card Reproduction by Xerox Copyflo. *Allen B. Veaner and John Fraser*	279
The Library of Congress Classed Catalog for Music. *Virginia Cunningham*	285
The Classified Catalog at Boston University, 1948-1964. *Mary D. Herrick*	289
Cataloging Rules	299
Shelfreading. *Paul E. Vesenyi*	302
The Place of the Technical Services in the Academic Library. *Miriam C. Maloy*	305
Reports of Meetings	307
Does Dividing the Catalog Relieve Congestion? *Fred Heinritz*	310
The Library Catalog: Focus on Form. *Seymour Lubetzky*	317
Copying Methods Notes. *Hubbard W. Ballou*	323
Organization Theory and the Card Catalog. *Sister Robert Mary*	329
Review	334

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The Chaplin Report*: A Symposium

LIKE EVERY ALA cataloging code since 1908, the Statement of Principles adopted by the IFLA International Conference on Cataloguing Principles at Paris in October, 1961, was "framed with reference to catalogues enumerating the contents of large general libraries." But, also like every ALA code, these Principles will to some degree affect the catalog in every library.

For this reason it seemed appropriate to ask people from several different kinds of libraries to examine Hugh Chaplin's *Report* of the Conference and the papers and discussion which resulted in the Statement.—P. S. D.

Large Public Libraries and the Paris Conference

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Librarians have had a foretaste of this document through prior release of the *Preliminary Official Report* of the International Conference on Cataloguing Principles (ICCP), which has been published in several countries and most widely distributed by inclusion in and reprint from the March/April 1962 issue of *UNESCO Bulletin for Libraries.*

The *Preliminary Report* made known the essential content of the *Statement of Principles* adopted at Paris in October, 1961, which apply in determining the choice and form of headings and entry-words in catalogs of printed books in which entries under authors' names, or where these are inappropriate or insufficient, under titles of works, are represented in an alphabetical sequence. It included the Resolutions adopted by the Conference and a summary of the voting on the twelve sections of the Statement.

All this, and much, much more is now available in the publication of the full *Report* which invests the bare bones of the preliminary

* International Federation of Library Associations. International Conference on Cataloguing Principles, Paris, 9th-18th October, 1961. *Report.* Edited by A. H. Chaplin and Dorothy Anderson. London, 1963. Available (at £3-3-0) from the Organizing Committee, c/o National Central Library, Malet Place, London, W.C. 1 or (at $9) from the Publishing Department, American Library Association, 50 East Huron St., Chicago, Illinois 60611.

eleven-page report with the radiant substance of the thoughts and ideas expressed by the conference participants in shaping the final statement. It also makes quite clear how firm was the foundation—that original draft statement prepared by A. H. Chaplin of the British Museum—on which the discussions were largely based.

The Summary of the Discussions at the general sessions, some sixty pages of the *Report,* constitutes, along with Resolution 1, its most significant part. The pattern of presentation followed is, first, the statement of a principle in the draft form submitted for consideration, followed by an edited report of the participants' discussions and proposed amendments, revisions or changes in scope or concept. It concludes with the text of the principle as modified and rephrased, where necessary, by a working group, then voted, and approved by the delegates representing fifty-three countries and twelve international organizations. Hugh Chaplin credits his Co-Editor, Mrs. Anderson, with responsibility for preparation of the synthesis of the discussions as well as the texts of the working papers which form a later part of the volume. Tasteful letterpress typography is characteristic of the entire *Report,* and in this section a clarity of continuity is obtained by printing the original principles in a modern sans-serif, the discussion texts in Roman, and the principles in the form as adopted in a complementary boldface sans-serif.

There are many bonuses included: the reports of sectional working groups on Arabic, Iranian, Indic, Hebrew, and other personal names, on bilingualism, and on transliteration are valuable products of the Conference even though these reports were not formally adopted. One report comprises a "Basic Vocabulary of Cataloguing Terms," a necessary aid to the participants and interpreters for communication in the five languages used at the conference, and a useful guide for the reader today in interpretation of the terminology used in the Statement of Principles and reporting of the discussions.

The *Report* includes seventeen working papers of high quality, prepared by cataloging experts throughout the world and here printed in English or English translation. These papers were originally submitted to the Organizing Committee to assist in the formulation of the draft statement of principles and were distributed internationally to predesignated participants and interested bodies prior to the Conference.

The ICCP *Report* is today a momentous document in the history of cataloging, and its influence is bound to be significant for years to come. Never before has there been an international assembly of catalogers, bibliographers, and library officers with cataloging expertise of such dimension. From an examination of the discussions and voting record of the delegations, one is struck by what can only be described as an amazing degree of unanimity prevailing.

The Council of IFLA in 1957 adopted a proposal for a world-wide conference to seek agreement on certain basic cataloging principles. By October 1958, in Madrid, the Council had succeeded in obtaining assur-

ance of a grant from the Council on Library Resources, Inc. to make possible a preliminary 1959 meeting in London to establish aims, define the aspects of cataloging to be discussed, prepare agenda, and set a time and place for the Conference. That meeting in June 1959 affirmed the conviction of the working group that "a conference would achieve practical results which would materially facilitate access to and international exchange of bibliographical information."

Of this major aim, Sir Frank Francis, the President of the ICCP, said in his opening address: "There is no need to emphasize the enormous value, both practical and psychological, which will accrue to all libraries from agreement on a set of principles achieved in an international meeting of this calibre. Such agreement would be invaluable not only as a guide for the revision of existing cataloguing codes, but especially as a guide in the development of library and bibliographical activity in countries where such services are being newly built up."

Through the dedicated efforts of the Organizing Committee, those who submitted working papers, the delegates, and many other interested individuals, and with further material assistance from the Council on Library Resources and UNESCO, the ICCP nobly succeeded in reaching its goals which had been formally conceived only a short four and a half years before.

What will be the impact of this international agreement in principles, particularly as they may relate to the catalogs and cataloging of large public libraries of the United States? The most direct and immediate channel of influence will surely be the present American Code of Cataloging Rules now being drafted by editor C. Sumner Spalding and a committee of the ALA under the chairmanship of Wyllis Wright, and in consultation with representatives of the Library Association.

Resolution 1 of the ICCP, passed unanimously, approved the Statement of Principles and requested that the official national delegates and their committees: (1) arrange for the widest possible publicity for the text among librarians; and (2) take action to ensure that cataloging rules in their countries are established or revised as quickly as possible in conformity with the Conference principles and put into practice, and that the same principles guide the compilation of national bibliographies.

Without a code for American libraries which does not merely reflect, but in its fundamental concepts conforms to the basic principles of the Paris Statement, the work of the Conference and the international agreements achieved will be seriously compromised. There is no doubt that American librarianship will be under world-wide scrutiny as our new code reaches completion.

In reviewing the twelve sections of the Paris principles, there are many that one finds consonant with current practice in our major public libraries. We now subscribe to the principle that the catalog should reveal whether the library contains a book specified by author and title, or by its title where no author is named. And we expect the

catalog to disclose what works by a particular author and which editions of a work are in the library. The assertion of these functions is some eighty-eight years old in our practice, deriving directly from the "Objects" of Cutter's 1876 *Rules for a Dictionary Catalogue.*

Perhaps the first instance of a difference in principle is found in Section 5, "Use of Multiple Entries." Here the Paris principles call for the entry of an author's name under a *uniform heading,* i.e. the single heading chosen from all possible forms to represent on all occasions a specific author. The delegates strangely left to the consideration of the following section, (6), "Functions of Different Kinds of Entry" [i.e. main entry, added entry and reference] the major discussion on the uniform heading principle. Questions of authors who have changed their names, contemporary authors using pseudonyms, and the scholar who conceals his identity in writing detective novels appear here, while the consideration of corporate bodies which change name is found in the discussions on Section 9.4, "Form of Heading for Corporate Authors." Some of our large public libraries are now using concurrently in their catalogs both pseudonym and real name, or two or more pseudonyms, when these represent one particular author. The modification of the uniform heading principle introduced in Section 5 is found in a footnote to 6.2, which makes permissive the use of more than one name for the same author "when a particular group of works is associated with a particular name." The uniform heading principle is in such instances to be maintained, but added entry for the pseudonym or other name may be used to provide a direct approach to the book published under other than the author's real name. Thus by indirection a new principle is established which, though it has precedent in some of our catalogs and apparently many European (particularly Scandinavian) catalogs, is not sanctioned in present ALA *Rules.*

Section 9, "Corporate Authorship" represents a major world-wide shift in cataloging policy. Though the concept of the corporate author has been finding its way during the past ten or more years into French catalogs and bibliographies, for most national delegations this constituted the most fundamental break with tradition, and there was considerable debate at Paris before its final acceptance. In the form which was approved, moreover, it includes at least two provisions which contradict current United States practice.

Section 9.4 makes the specification that the uniform heading for works entered under the name of a corporate body should be the name by which the body is most frequently identified in its publications. This represents a radical departure from the distinction that we have drawn between society (the uniform heading, its name) and institution (generally, though not consistently, a place name as first entry word). Again, having based the choice of uniform heading on name used by the corporate body, it is a logical sequence that the Paris Principles state in 9.45 that if a corporate body has used in successive periods different names, which are not minor variations of the same name, the heading

for each work should be the name used at the time of its publication.

It is ironical to reflect that these two principles were among those suggested by Seymour Lubetzky in his critique, *Cataloging Principles,* and that his studies and the preparation of that document stemmed from our desire to seek solutions to the inconsistencies of the "corporate complex" as structured in some seventy rules in the 1949 ALA code. While acceptance abroad at the ICCP was achieved, at home these principles constitute a problem of considerable consequence to achieve their reconciliation with existing entries in our long-established, monolithic card catalogs; they are the one major source of yet unresolved compromise efforts in the current preparation of our code of cataloging rules. It is thus that the dead hand of history plagues us.

In Section 11 there is another major departure from our general practice and the present ALA code. "Serial Publications" (11.5) states that when these publications are entered under title, and when issued in successive periods under differing titles, they are to be given entry under each title as published. As radical as may seem the foregoing principles for corporate bodies and for serial publications, they have in fact been accepted principles for entry in some major public library catalogs for many years. The Newark Public Library, for example, has long cataloged serials under title as published, as has The New York Public Library since 1952, while in the latter library most institutions (other than those of government) have been entered directly by name for some fifty years. There is a reasonable expectation that, albeit emasculated, these principles will become a part of the new cataloging code.

In the voting on adoption of principles for the entry of Collections (10.3) the Conference had its greatest lack of agreement. Two alternate proposals were offered to the delegates, and the one which was accepted by a vote of 35-22 includes provision for the entry of a collection of independent works by different authors, having a collective title, under title of the collection, but substitutes for title entry that of the compiler if his name "appears prominently on the title page." This seems weak, particularly since "prominently" is not defined and invites a subjective decision.

The form-subheadings of our present catalogs for the grouping of laws, constitutions, and treaties are eliminated by Section 9.5. These are to be entered under the name of the appropriate state or territorial authority, with formal or conventional titles describing the material.

Were the Paris Statement of Principles to serve as the unequivocal basis for a code of rules for our public libraries, we have seen some of the places where complications would arise in relation to existing catalog entries. There are spots where the Statement lacks clarity. It proposes in Section 3, for example, that the catalog should contain "more than one entry relating to any book, whenever this is necessary . . . for example: (3.21) when the author is known by more than one name or form of name." Surely for this a name reference or references are indicated. Multiplicity in number, or variety in form of names of one

author are conditions of his name and are not normally or necessarily related to one book. But aside from a limited number of places where problems of interpretation do arise, our cataloging code could embody the Paris principles for those elements within its scope, and public libraries could adopt such a code without insurmountable difficulties. The effect would be, for large public libraries which accepted these principles, the need to consider either making modifications in their existing catalogs in order to create entries consistent with the principles; the retirement or closing off of existing catalogs and the establishment of new ones; or the "superimposition" of the new on the old (a practice not unknown), with as little modification of past work as possible. In some instances the very magnitude of existing catalogs is forcing consideration of the development of new catalogs in our large public libraries. In others, conventional card catalogs are giving way to, or being supplemented by, catalogs produced in book form by a variety of means, and it can be anticipated that electronic data processing devices will make obsolete still other card catalogs before long.

To quote from a very ancient document entitled *General Considerations on Catalog Code Revision* (ca. 1955): "Code revision should proceed without regard to the amount of recataloging of materials at present in the catalog. . . . We believe that the time has come when we must have a complete re-evaluation of our rules and our practices. If a new code is to be a substantial improvement over the old, it cannot be the result of compromises based on the amount of materials previously cataloged. . . ." One may speculate whether such an attitude still underlies our own code revision, but it is abundantly clear that this philosophy did direct the development of the Statement of Principles adopted at Paris.

Small Public Libraries and the Paris Conference

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The *Report* of the International Conference on Cataloguing Principles provided this writer with a broad, searching analysis of choice of entry for the library catalog. The summaries of conference discussion of each section of the Statement, the seventeen working papers, and the reports of the sectional group meetings cover every major aspect of entry work from corporate authorship through transliteration to the affect of electronic information systems on cataloging rules. The *Report* also gives a rather impressive picture of the Conference wrestling with a

particular area of international concern in depth and arriving at historic agreement.

The 1961 Conference is an important beginning. The Conference recognized this fact in its resolutions to continue its work in specific areas. The ALA Committee on Code Revision has approved with minor exceptions the Paris Statement (hereafter referred to as ICCP) as the basis for the rules in the new cataloging code. It is up to librarians at all levels of activity to continue in the spirit of the Conference to consider the theoretical and practical aspects of a new code based on ICCP principles as they may affect individual libraries and relationships between libraries and information systems.

There are at least two main levels at which a smaller public library might consider ICCP principles: the local level and the level of relationships between it and other library and information systems.

At the local level the smaller public library must consider the needs of its users, the nature of the collections which support those needs, and the cataloging policy and resources which must organize those collections for use. The Summit Library is a smaller popular library serving the general reading needs of adults and young people in the community, supplementing the resources of the school libraries, and serving as a general information and reference center. Its collections primarily emphasize general, current treatment and interest in all areas. Catalog entry is established according to ALA rules on a no-conflict basis with simplified cataloging for current works of fiction. For the most part, books are cataloged with the information at hand soon after publication, if not before date of publication. There are neither the tools nor the time to support extensive entry research. Little or no recataloging is performed primarily because of lack of time. When we as a smaller public library consider ICCP, therefore, we do so without having to concern ourselves about overwhelming collections of institutional reports, government documents, serial publications, works in many editions and translations, foreign language publications, and their attendant problems.

There is only a statement of general principles in ICCP. It is not easy for one not thoroughly involved in code revision to anticipate how these principles will be translated into a code of rules. It seems, however, that the functions and structure of the catalog and the kinds, use, and function of entries as stated by ICCP are in general accord with the aims of our catalog; differences would be perhaps a matter of emphasis and degree rather than kind. Generally speaking, ICCP based entries could probably be interfiled with our ALA no-conflict entries with a few exceptions. Departures from ALA rules in ICCP, however, whose adoption might create major concern in a large general library, would not present much difficulty in a smaller library's catalog. Since it represents a collection which is constantly changing and being renewed, the catalog has to accomodate entries of old and new vintage and remain useful. This mixture tends to force a certain amount of compromise on the

catalog, especially on the second function of the catalog which is to bring works of the same author, in various editions and translations together. In the broadest sense, however, our catalog is essentially a finding list. Its use falls more heavily into the area of the first function of the catalog as stated in ICCP Section 2.1.

Specific departures from ALA rules in ICCP include bringing entry for "institutions" under the general rule for corporate entry. From our readers' and this cataloger's standpoint, the distinction between societies and institutions is of questionable value in using and building our type of catalog. References between ALA entries and ICCP entries would perhaps be adequate substitutes, since we acquire little material that would require such entries.

ICCP also departs from ALA in its provision that corporate body be entered under the name used at the time of publication rather than the latest form of name. Under our "no-conflict" policy this principle for handling successive changes of name would possibly be more workable than the ALA provision which may require research to establish latest form. We probably have no reason so important to bring together all works of a corporate body under latest form of name to justify recataloging. Our needs would be adequately served by connecting references.

For the reasons given above, ICCP change in serials cataloging from ALA entry under latest title, with references from earlier titles, to entry under successive titles, with reference notes, seems to make sense generally and especially to us, in terms of cataloging use and economy.

The provisions in ICCP for uniform heading may not be entirely suitable for our catalog needs. We rarely have so many editions or translations of a work that lack of uniform headings would create confusion in our catalog. Perhaps our chief concern would arise if Library of Congress, assuming it would adopt that provision of the new code based on ICCP, were to use uniform headings on their printed cards. We might not be able then to use these valuable cataloging aids without expensive modification.

So far we have discussed ICCP in terms of a small library's local needs. But today a smaller library cannot afford to operate and develop in isolation. At the very least it must depend on inter-library loan to supplement its resources, and that means bibliographic communication at higher than the local level. In recent years smaller libraries have become part of federations or regional systems with union catalogs in some form better to meet their users' increasing needs. Centralized cataloging and processing have provided partial solutions to the problem of coping with increasing acquisitions, accompanying rise in cataloging costs, and the general scarcity of cataloging personnel. If these efforts to share resources are to be successful, general use of a standardized cataloging code is essential.

School Libraries and the Paris Conference

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It might be presumed that the International Conference on Cataloguing Principles held in Paris, October 1961, because the resulting principles were ". . . framed with special reference to catalogues of . . . large general libraries," would hold little interest for school librarians. Reading a bit further, however, it is reassuring to find that ". . . their application to the catalogues of other libraries . . . is also recommended, with such modifications as may be required." This presumably includes school libraries, which all too often, are among the smallest of the small.

A review of the Draft Code of the ALA Catalog Code Revision Committee (to which the Paris Conference Statement of Principles bears a strong resemblance) has pointed out the attitude of many school libraries toward this Draft Code.* The rules seem simple, and school librarians appreciate this. Because school library collections are changing so constantly, the switch to a new set of rules may well be less difficult than in many other types of libraries, and hence relatively painless. And many of the rules have been in effect in school libraries for some time.

For example, school librarians have long followed the practice of entering the author's name in the form printed in the book. Youngsters would seldom know to look under Charles Dodgson for Lewis Carroll or under Mary Ann Evans for George Eliot. With these and other authors who write under one or more names (which may or may not be the correct name), reference can be made as necessary.

The Paris Conference Statement of Principles also depends strongly on the author's name as found on the title page of the work, and school librarians will generally agree with the principle. The Conference endorsement of the "no-conflict" principle will also find ready agreement among school librarians who have, for some time, added identifying dates, words, or phrases to the entry only when necessary.

In the *Report* of the International Conference on Cataloguing Principles, many of the working papers are on subjects that have little, if any, value for school library catalogers, e.g., "Treatment of Arabic Names," and "Rendering of Indic Names-of-Persons in Catalogue Entries." However, the summaries of the discussions, the draft statements of the principles, the voting tallies, the reasons why participants voted against, or abstained from voting—this will hold real fascination for those who are curious to know just how cataloging rules (at least these cataloging rules) come about.

* Dodendorf, Mary Seely. "School Libraries and the Draft Code." *Library Resources and Technical Services*, 5:281-4. Fall 1961.

In the ALA Draft Code, the rule that appears to bother many school librarians is Rule 10, covering adaptations. The problem of entry for the adapted or "watered-down" classic is a constantly-recurring problem in many schools where the notion exists that literature must be made as painless as possible. No rule covering adaptations appears to be included in the Paris Statement. For schools purchasing abridged or adapted classics for the school library, entry under the original author in all cases *would* bring all copies of the *Odyssey* together on the shelf, and the student could make his choice. This does indeed make the various editions easier to find but presents a moral problem. Should we not distinguish between "the real thing" and an adapted version by entry under the author for the former and the person responsible for the adaptation in the latter? Good examples are the various adaptations for children of the *Odyssey* by Church, Colum, Picard, etc. They bear little textual resemblance to the original, just as many other of the adapted classics show little resemblance to the original. Are we doing youngsters a disservice when we enter and shelve abridged versions of the work of writers such as Jane Austen, Robert Louis Stevenson, and Charles Dickens side by side with the original, undisturbed by the fact that children may mistakenly believe they are getting the original?

Although corporate names may not appear as often in school library catalogs as in catalogs of other libraries, the need for up-to-date material in the sciences, on current affairs, and in many other subjects requires that school libraries acquire government publications and publications from other corporate bodies, perhaps more than they did ten or fifteen years ago. The Paris Conference's adoption of the principles of corporate entry which provides that societies and institutions be entered under their names provides clear guidance in this matter and is in basic agreement with the ALA Draft Code.

With respect to collections consisting of independent works or parts of works by different authors, it appears reasonable that school librarians will agree with the alternative text, that of entering the work under the compiler if he is named on the title page, or under the title of the collection, if the compiler is not named on the title page. This appears in closer agreement with the spirit of previous principles of entry than is entry under title of the collection (as first preference), or name of author, or under title of first work in the collection, if there is no collective title.

The school library catalog must be kept as simple as possible, not only for the sake of the student, but also because school librarians cannot devote a great deal of time and attention to the problem. We cannot afford, however, to sacrifice sound practice to simplicity. We talk a great deal about lack of personnel in the school library and lack of time for attention to cataloging. But a well-made catalog is, after all, a most efficient and time-saving assistant.

Secondary school students, as we know all too well these days, frequent libraries of all kinds, from the local neighborhood library to the

Library of Congress, and in unprecedented numbers. A well-made catalog in the school library furnishes him a smaller version of the huge university or public library catalog he may be using next month or next year. As school librarians begin to think less of the differences between their libraries and others, and more of the likenesses among them, it may well be that procedures recommended for public, college, university, or even special libraries will be appropriate. Consideration and adoption of some of these procedures may produce a more workable school library catalog and ease the transition of the peripatetic student from one library to another.

I believe that what I am really trying to say is that we cannot dismiss the ALA Catalog Code Revision Committee Draft Code and the Paris Statement of Principles by saying that they're all right for these large libraries, but they won't work for me. The secondary school library grows more like the college library every day—in collection and services. Our students use the school library in the morning, and the public library or a nearby college or university library in the afternoon and evening. Perhaps one of the real reasons why school libraries have been ineffective in the past is our partly self-stimulated alienation from the world of librarianship. The impact of these two Draft Statements on library service is and will continue to be important (yes, even to school libraries), and school librarians need to be informed on the subject.

University Libraries and the Paris Conference

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This *Report,* edited by A. H. Chaplin and Dorothy Anderson, represents both a landing point and a take-off stage—the one a culmination of approximately ten years of intensive work; the other a point of beginning if catalog entries are to be generally in agreement or compatible on the international level. Whether the latter becomes a reality depends, of course, on the actions taken in each country to implement the Statement of Principles which is actually more a general outline for a code of rules than a dictionary definition of principles. While we do find Lubetzky's two "objectives" as "Functions of the Catalogue," we do not find any recognition that Section 2, "which works by a particular author and which editions of a particular work are in the library," is merely a by-product of Section 6.1, the use of a *uniform heading,* which in turn is, according to Cutter,[1] a convenient *means* of determining whether or not the library contains a particular work of which

[1] Cutter, Charles A., *Rules for a Dictionary Catalogue.* 2d ed. Washington, Government Printing Office, 1889, pp. 8, 16.

either the author or title or subject is known. In general, however, the second function is ignored when convenient, *e.g.* different names of corporate bodies in successive periods, and even more notably ignored in the first Working Paper whose author urges "enthusiastic support to the Lubetzky basis for cataloguing codes" while at the same time recommending that the "Word 'by' and its equivalents should be honoured just as far as is practicable."

The Working Papers and the discussions do, however, add significantly to the rather rich body of literature on catalog entries published in the last ten years. To a conscientious reader of the professional (library) press it is a discouraging and sometimes tiresome experience to read again the same arguments and opinions—only the names of the persons (and the specific examples) are sometimes different, and many would generalize a whole principle from one example. Too, the absence of clarity is as prevalent in these papers as in too much of our professional writing. On page 159, for example, we find that "it becomes every day more essential to reduce the multitudinous labyrinth of references, and to lead the reader as directly as possible to the information he requires." Not to lead the reader directly is, of course, to be for sin and against motherhood, but when do references become a multitudinous labyrinth? There is at least one spokesman for the idea that the cataloger can "enter the publication in any way he pleases, provided that all necessary cross-references and authority cards are made."[2]

The Organizing Committee had hoped that the Conference might be a model for similar international meetings. Certainly the *Report* is a model in which, among other excellent qualities, the discussions were edited for relevance to the section under discussion, in striking contrast to the Stanford and Montreal *Proceedings*. On the other hand, we had the *Summary of Proceedings* from Stanford and Montreal within a few months, but two years have elapsed since the Paris Conference. A discussion of the impact of the Paris Statement on university library cataloging may well be irrelevant in view of the work done by the ALA Catalog Code Revision Committee in the interim, work with which this reviewer is not familiar.

As a librarian intimately involved in university library cataloging, I cannot but agree that standardization of catalog entries is not only reasonable but eminently desirable, preferably on the international level but at least on the national level. We all know in a general way that we are part of the international world of scholarship, but we are immediately aware that the academic world is highly mobile. Those of us in university libraries still classified by the Dewey Decimal scheme are frequently called upon to explain why we are not using the Library of Congress system as in the superior university library from which the new faculty member came. A different scheme for the physical location of materials is one matter, but a similar condition in university library

[2] Taube, Mortimer. "The Cataloging of Publications of Corporate Authors." *Library Quarterly*, 20:18. January 1950.

catalog entries would be intolerable. A code for university library catalogs must be not only international in spirit but also permit the fewest possible variant interpretations.

We must also face the fact that the younger generation of catalogers does not share the same liberal arts background as the catalogers of the past or the middle-aged catalogers of the present. Consistent catalog entries for current materials cannot depend on "best known" or "most frequently used" form. Such criteria are useful only in retrospect, thus Sections 7 and 8.2 in the Statement of Principles are useless as they stand, while 8.21, which permits the author's name to be that "established in general usage . . . in relation to his public activities other than authorship" is not only in conflict with Section 12, but opens the door to provincial rulings which will destroy all hopes of international agreement in practice. As only one example, the majority of a cataloging class thought that General De Gaulle should be treated as an exception to ALA rule #39 B. (2)(a). The dichotomy between the local and the international view became clear when it was found that *Biblio* does not even give a cross-reference from De Gaulle. Too, if the "fullest form commonly appearing" in an author's works is initials, will the "further identifying characteristics" be his personal names in full?

Johannes L. Dewton, in an unpublished but rather widely distributed "Table of Agreement and Differences," finds ten sections of the Paris Statement of Principles in "Complete or Basic Disagreement" with the ALA *Rules* (1949). Of these the two relating to choice of uniform heading have already been mentioned as impossible of application as presently stated and as applied to the cataloging of current materials. Of the remaining sections in disagreement, some are repetitions included in the Statement of Principles for the "sake of logical completeness," and several are mandatory requirements for added entries. There are thus only three remaining differences of major significance.

Section 10, Multiple Authorship, would present no great problem either in principle or, if the "second function" were relegated to a method as it should be, in practice, since it need not be applied retroactively. In view of the exception in 10.34, the adoption of an alternative text by the ALA Catalog Code Revision Committee seems an unnecessary barrier to international agreement. Moreover, in either case, the present distinction between collections and the artificial "composite work" will no longer be necessary.

The adoption of Section 11.5, the entry of serial publications under successive titles, is, of course, in complete disagreement with our current rule but not necessarily our current practice. F. Bernice Field's paper at the Stanford Institute showed clearly that librarians can adopt a principle but at the same time follow whatever practice is expedient. The pros and cons of the issue were thoroughly explored and summarized by Miss Field in the same paper and probably constitute a correct prediction of the practices which will be followed in university libraries in the future, regardless of the ruling in the code adopted.

The problem of corporate authorship, including the uniform heading for works entered under the name of a corporate body, is wholly different from the preceding points. The literature on this problem is both prolific and brilliant, as, for example, J.C.M. Hanson's two classic articles (*Library Journal,* 1905, and *Library Quarterly,* 1935), Laura C. Colvin's paper at the Stanford Institute, and V. A. Vasilevskaya's paper for the Paris Conference. This review is not the place to repeat the arguments but to raise the question as to how much, if any, objective data we have on the relative efficiency of the two methods. I have full faith in the subleties of the American cataloger's mind for working out something less than total change, especially in view of the enormous expense involved. Before we either give full sway to logic and seeming simplicity, or more probably, compromise, could we not have a valid research study of the efficiency of the present catalog in order to resolve not only this point but all other proposals for change?

We seem to have assumed that our present catalog is an inefficient instrument for the research needs of our patrons. We know that it is subject to improvement, and certainly its compilation is not cheap. We also know from such statistics as are available that superior indexing methods are even more costly, but only a very few university libraries at the present time have or are willing to invest the requisite money for a new approach, primarily via machines, to cataloging. Surely the time is long overdue for research instead of opinion. We have had too many statements such as "the catalog user is not interested in the particular publication but rather in the work represented by it" (Lubetzky, p. 141); that "the reader . . . may know more about the elements identifying a certain publication of a work than about those identifying the work itself" (Verona, p. 147); or that the reader is "normally interested primarily in a work rather than in a specific publication" (Jolley, p. 160), with no research cited as to what "the reader" actually prefers or how often he uses what approach.

To close this review with a positive note, perhaps the greatest virtue of the Paris Conference and its published *Report* is better understanding of cataloging problems on the international level with the real possibility for continuing work on better dissemination of the information needed if cataloging is to reflect literate standards of the various nations represented in the catalogs of research libraries.

Special Libraries and the Paris Report

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Special librarians who are practicing catalogers should have the same interest in this Conference as would catalogers for any other kind of library. They, too, have waited long and impatiently for the revised ALA rules. So the proceedings of this Conference may be regarded as a real milestone toward certain official cataloging rule revisions. In the meantime the results of the Conference can serve quite profitably for all as a real milestone toward certain official cataloging rule revisions. In the thinking of quite a distinguished body of librarians. A copy of the *Report* should be in every library where cataloguing is practiced and be required reading, or at least browsing, for all students of library service.

It was interesting to note that of the approximately 100 participants only a few were in an obvious sense special librarians, although out of an almost equal number of observers, about 10 per cent seemed to be representatives of special libraries. There are, though, obvious reasons for this apparent imbalance of representation:

(1) The majority of special libraries are comparatively small operations with only one or two profession librarians involved, thus making attendance impractical;
(2) costs for such sojourns are not always easily or readily approved by special library managements;
(3) the high proportion of library school representatives indicates that such teachers were, and properly so, contributing to the formation of new cataloging principles.

As to the resolutions finally adopted, I believe all special librarians would (and probably already do) go along with the statement of the 12 principles in Resolution I. The scope statement indicates, "The principles . . . are framed with special reference to catalogues enumerating the contents of large general libraries: but their application to the catalogues of other libraries . . . is also recommended, with such modifications as may be required by the purposes of these catalogues . . ." Thus these principles become for special librarians a set of important general guide lines.

Of the eight other resolutions, only one (VI) seems to merit close attention by special librarians. The Special Libraries Association could well be one of the "interested parties" to cooperate in a study of the possible repercussions on cataloging rules of the use, especially in large libraries, of electronic machinery and of mechanical procedures in general.

A useful guide provided during the Conference was a vocabulary of

60 cataloging terms. It was compiled to encourage uniformity in the use of terms by speakers, and should serve as a helpful tool for all librarians, particularly since it is given in five languages (English, French, German, Russian, and Spanish).

The working papers themselves were, in general, excellent to good but often left the reader almost no better off than if he had not read the piece. Discovery of paper No. 8 ("Problems in the Cataloguing of Serial Publications") caused my pulse to quicken; but even before the conclusions are presented, the librarian has already been informed that, "broadly speaking, whatever the cataloguer has time for is possible." Admittedly the author, an eminent professor, raises vital questions, but the answers are not truly satisfying.

The final paper (No. 17) of the Conference, C. D. Gull's "The Impact of Electronics Upon Cataloguing Rules", explores the possibility that nonhuman authorship (automatic authorship) "may become an important factor in the production of materials which cataloguers must catalogue, and consequently a factor which will require the development of additional rules for cataloguing." Mr. Gull covers the technical aspects of the kinds of material which may be involved through automatic authorship with expertise and characteristic thoroughness. But perhaps the highlight of his paper is that gratefully he does not by-pass a point which catalogers today may understand even better than the author's technical thoughts, a point they had better heed, too: "Cataloguers must fit cataloguing rules to human capabilities and adapt them to changes in technology; indeed, they must enlist the aid of new technologies to assure that cataloguing rules are based on substance rather than form."

LIST OF OUT-OF-PRINT LRTS

Winter	1958	V. 2, #1	Winter	1961	V. 5, #1
Winter	1959	V. 3, #1	Winter	1962	V. 6, #1
Spring	1959	V. 3, #2	Spring	1962	V. 6, #2
Winter	1960	V. 4, #1	Winter	1963	V. 7, #1
Spring	1960	V. 4, #2	Spring	1963	V. 7, #2
Summer	1960	V. 4, #3			

If anyone has copies to spare of any of the above, they would be gratefully received by the RTSD Executive Secretary, American Library Association, 50 East Huron St., Chicago, Illinois 60611.

Measure of Indexing

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IN CONJUNCTION WITH a research project on the automatic indexing of natural language textual materials* measures were developed to permit useful comparison of the mechanically produced index for an inorganic chemistry textbook with the average, conventionally-produced index for the same type of material. While they were designed primarily for the study just mentioned, the measures should be useful as a point of departure for evaluation of indexes and for the development of objective standards for indexing.

Evaluation of indexing can be done from the point of view of:

1. the individual product, and
2. the product as compared to other products of the same species, the product as a member of a group.

When an index is evaluated as an individual product, this is done in terms of its purpose, the needs of its potential users, the needs of the particular subject area, and its cost.

When it is evaluated as one of a group of indexes, it is necessary to determine how a given index compares, both in quality and in cost, with those generally found in the same type of material in the same subject area. This cannot be done without defining the quality of existing indexes.

Quality should be determined in an objective manner. The simplest way of expressing quality is to say that something is good or bad. However, "good indexing," as such, has never been defined. It is a function of many variables, some known, some not yet identified. Even the most frequently mentioned variable, purpose (How good is it for its purpose?) has not been satisfactorily defined. By purpose we usually mean adequacy in terms of the retrieval needs of user, which is also a variable. Other frequently considered variables are cost, editorial policy, etc.

Thus, all that could be said for the research project mentioned above was that its aim was the mechanical production of an index which compares favorably with conventionally-produced indexes in standard inorganic chemistry textbooks. In other words, it was necessary to establish

* Artandi, S. *Book Indexing by Computer*. Ph.D. Thesis, Rutgers, 1963. Research was supported by the U. S. Air Force under Grant No. AF-AFOSR-62-9 monitored by the Air Force Office of Scientific Research of the Office of Aerospace Research.

an average level for manually-produced indexes, and to test the computer-produced index against this average.

The measures were developed primarily with book indexing in mind and as of this time have not been related to the indexing of periodical, patent, or report literature.

Evaluation is based on three criteria:

1. Density of indexing
2. Distribution of indexing
3. Completeness of indexing.

Both density and distribution can be measured in a completely objective manner.

There are two measures of density:

Heading density, the ratio of the total number of index entries to the total number of words in the book.

Entry density, the ratio of the total number of page references to the total number of pages.

Distribution considers the ratios of index entries for compounds, proper name entries, and of all other types of subject entries to the total number of index entries.

The measure for completeness is not based on objective data as found in the index but includes, in addition, the indexer's point of view concerning the level of indexing he wants to achieve. This level of indexing, in turn, may have nothing to do with the assumed retrieval needs of the user and may very well be due to such factors as cost and space considerations or editorial policy. Thus it is possible to get for a given index a high completeness score coupled with a low density figure.

Density and distribution indicate, crudely to be sure, a certain level of indexing. Completeness shows how well the indexer achieved what he set out to do.

1. *DENSITY OF INDEXING*

The ratio of the total number of entries in the index to the total number of words in the text will be called Heading density (D_1) and expressed by the fraction

$$D_1 = \frac{E}{T} 1000 \quad \text{where}$$

E = total number of index entries
T = total number of text words.

The resulting figure gives the number of index entries per thousand text words.

An index entry is defined as an entry with a page reference or a "see" instruction. The number of index entries are to be counted, not estimated.

The total number of the text words is arrived at thus:

1. The total space that is taken up by illustrations, charts, blank spaces, etc., in the book is expressed in terms of pages. This number is

deducted from the total number of pages in the book to give the total number of text pages.

2. The number of lines on a full text page are counted, and this figure is arbitrarily accepted for all text pages. The assumption is made here that all text pages are full pages, which is a reasonable assumption since the space occupied by illustrations, charts, etc., has already been taken into consideration.

3. The average number of words per line is calculated statistically. The words in three randomly-selected lines are counted on a 3-5% sample of all pages. The average, the standard deviation, and the confidence limits are calculated for the sample. When a sample page selected happens to be one with nothing but charts or illustrations on it, it is skipped and another sample page added to the random series.

4. The average number of words per line resulting from the above calculations is then used to estimate the average number of words per text page and the total number of words on the text pages.

Another possible method of calculating D_1 is to divide the total number of words in the text by the total number of index entries. This gives the number of text words per entry. While it is a completely valid figure, it is not as clearly understandable as the other because high density is expressed by a low figure.

The ratio of the total number of page references to the total number of pages is called Entry density (D_2) and is expressed by the fraction

$$D_2 = \frac{R}{P} \quad \text{where}$$

P = total number of pages
R = total number of page references in the index.

The resulting figure gives the average number of times a page was referred to by the index.

Where P is concerned, there are two possibilities. Either all of the pages of the book may be used or the text pages only; text pages have been defined above. The former was decided upon as more meaningful, since reference to illustrations, charts, etc., is an important function of the index which needs to be considered in its evaluation.

Page references in the index are actually counted, each page number is counted as one entry except that consecutive page numbers or inclusive page references are also considered as single entries. For example, (5, 6, 7) or (5-7) or (5ff.) would all be counted as single references.

2. *DISTRIBUTION OF INDEXING*

Distribution of indexing is a purely quantitative measure designed to establish the distribution of the various types of entries within the index. The types which can be identified will vary with the subject area. For the purposes of this project, three types were identified:

1. *Proper name entries.* In the field of inorganic chemistry these

include, for example, the names of persons, the names of places, and laws, processes, theories, equipment named after individuals, etc.

2. *Names of individual compounds.* An entry in this category is defined as the name of an individual compound entered in the singular with no modifying phrase attached to it. For example, PERIODIC ACID but *not* PERIODIC ACIDS or PERCHLORIC ACID, PREPARATION OF.

3. *Other entries.* This group includes all types of subject entries other than those in groups 1 and 2, including plurals of names of compounds indicating groups, singulars with modifying phrases, etc.

Calculating figures for several titles in a field is useful in estimating the relative importance of the various types of entries for that particular field. This not only provides a basis for evaluating an existing index, but can be helpful when an indexing procedure is being planned.

3. *COMPLETENESS OF INDEXING*

Completeness of indexing is calculated on a statistical basis by taking a random sample of the pages of the book. Completeness is expressed as the ratio of the number of entries in the index for the pages in the sample to the sum of three figures:

1. number of index entries for the sample pages,
2. the errors found in the index for the sample, and,
3. the entries not found in the index for the sample but judged to be necessary when the level of indexing to be achieved by the original indexer is taken into consideration. In other words, where an entry should appear according to the pattern the indexer set for the choice of entries and does not, an omission is registered.

Completeness is expressed by the fraction

$$C\% = \frac{E}{E + ER + G} 100 \quad \text{where}$$

E = sum of index entries for the sample pages
ER = sum of the errors found in the index for the sample pages
G = sum of the entries not found in the index for the sample pages but considered necessary (omissions).

An index entry is defined as an entry with a page number attached to it, which is identical with a page number in the sample. That is, all those entries in the index which have page numbers the same as those in the sample. Where inclusive paging is used, only the first page number is considered. For example, Oxygen 5-10 is counted as a reference to page 5 only. Errors are references in the index which refer to pages on which information relative to the entry does not appear.

Both the number of entries and the number of errors can be measured quantitatively. However, when G is calculated, a qualitative evaluation of the index becomes necessary. First, the level of indexing that the original indexer set out to achieve must be identified. This operation cannot be reduced to the mere counting of entries; it in-

volves the use of personal judgement based on a knowledge of indexing and familiarity with the subject area. This also applies to the next step, which is the identification of omissions in the index when the original indexer's objectives are considered.

Completeness is expressed as a percentage. An index is one hundred percent complete when there are no errors or omissions in it when judged according to the criteria outlined above.

For the purposes of the mechanical indexing project, an arbitrary decision was made to use the averages of the three evaluative criteria calculated for the five experimental titles given in Appendix I as the level of indexing with which the mechanically-produced index is to be compared.

These five titles are a fair sample. The two characteristics which they have in common—subject matter and type of publication—are characteristics on which the experiment is based to some extent; the characteristics in which they vary (publisher, length, price, approach to indexing) make them a good representative group of titles.

The averages resulting when the measures previously described were applied to the five experimental titles were:

D_1 (Heading density)	9.1
D_2 (Entry density)	4.7
Distribution	
Proper names	31.8%
Compounds	18.8%
Other	49.4%
C (Completeness of indexing)	78.23%

These averages can be used as standards to which indexes found in the same type of materials, in this case in inorganic chemistry textbooks, may be compared.

While there is good reason to believe that similar averages can be calculated for other types of materials in other fields to measure the comparative quality of their indexes, further research will be needed to prove the general validity of the approach.

TABLE 1
DENSITY OF INDEXING

Title	D_1	D_2	Average D_1		Average D_2	
			Words	Entries	Reference	Pages
Tyree	5.3	2.19	136,666	729	932	426
Kleinberg	6.1	2.73	260,976	1,584	1,811	664
Sneed	7.8	2.81	86,447	681	680	242
Barnett	8.4	6.69	340,418	2,875	3,754	561
Moeller	14.2	6.70	316,227	4,495	6,153	918
Averages			9.1		4.7	

TABLE 2
DISTRIBUTION OF INDEXING

Title	Total number of index entries	Proper names	%	Compounds	%	Other	%
Tyree	729	76	11	148	20	605	69
Kleinberg	1,584	50	3	233	15	1,301	82
Sneed	681	132	5	146	21	503	74
Barnett	2,875	1,105	38	1,061	37	708	25
Moeller	4,495	2,030	45	361	8	2,104	47
Total	10,364	3,293		1,949		5,121	

Averages

Proper names	31.8%
Compounds	18.8%
Other	49.4%

TABLE 3
COMPLETENESS OF INDEXING

For the calculation of completeness in each title the chapter on halogens was considered as an individual monograph.

Title	Pages	Fraction of total pages	C^*	$C \times F^*$
Tyree	20	.0504	31%	1.562
Kleinberg	30	.0756	69%	5.216
Sneed	242	.6096	82%	49.987
Barnett	41	.1033	72%	7.438
Moeller	64	.1612	87%	14.024
Total	397			78.227
Average			78.23%	

*C = Completeness
F = Fraction of total pages

TABLE 4
CORRELATION BETWEEN HEADING DENSITY AND COMPLETENESS

Title	Heading Density (D_1)	Completeness (C)
Tyree	5.3	31%
Kleinberg	6.1	69%
Sneed	7.8	82%
Barnett	8.4	72%
Moeller	14.2	87%

APPENDIX

List of Experimental Titles

1. Moeller, T. *Inorganic Chemistry . . .* Wiley, 1952.
2. Sneed, M. C. et al. *Comprehensive Inorganic Chemistry.* Vol. 3. "The Halogens." Van Nostrand, 1954.
3. Tyree, S. Y. and K. Knox. *Textbook of Inorganic Chemistry.* Macmillan, 1961.
4. Kleinberg, J. et al. *Inorganic Chemistry.* Heath, 1960.
5. Barnett, E. de B. and C. L. Wilson. *Inorganic Chemistry.* 2nd ed. Longmans, 1957.

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Subject Indexing Mythology*

BELLA E. SHACHTMAN
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WHEN DR. ARTANDI of Rutgers invited me to prepare a paper on some aspect of Alphabetic Subject Indexing, I thought she must be clairvoyant, for how else would she know that at this particular point in time, this subject is of vital interest to the staff of the National Agricultural Library? You may or may not know that Congress gave us money in our 1964 appropriation to plan for a desperately-needed new building for the National Agricultural Library. What does this have to do with the subject? A great many things, based on a great many "ifs."

If we get our new building, we shall probably retain a branch library in our present location since the new building will be on the grounds of the Agricultural Research Center at Beltsville, Maryland. In this branch, we shall need a complete catalog of the collection and at present we have only a single alphabetical dictionary catalog on cards. We are exploring how we can feasibly publish our catalog—not only for the proposed branch, but also for the benefit of our field libraries and the land-grant university and other agriculture oriented libraries spread across the country. At the same time, we are seeking the best method to keep all of these libraries informed currently of the titles newly cataloged for the collection. If the publication of our catalog becomes a reality and if we get our new building, exciting and challenging opportunities open up before us—opportunities which come but rarely to a library over 100 years old. We are presented with the opportunity to begin a new card catalog which can be an alphabetical, traditional classified, or a faceted classified catalog. We have the opportunity, the challenge, and the obligation to consider such things as: how automation can help us; whether we should change our scheme for shelving publications; whether we should retain a permanently growing card catalog or one that is replaced by printed catalogs; how the printed catalogs should be arranged and their relationship to our bibliographic index, the *Bibliography of Agriculture*. If we get our money and therefore our new building and if we establish a publishing

* Adapted from presentation at the third Seminar on Systems for the Intellectual Organization of Information: Alphabetic Subject Indexing; Graduate School of Library Service, Rutgers, The State University, March 12, 1964, New Brunswick, New Jersey.

program to spread the results of our cataloging efforts, we no longer have to be bound to tradition. We can close off or dispose of our old card catalog. We can close off our old collection and begin arranging our new publications in some different way. We are faced with Decisions, Decisions, and more Decisions. All I hope is that Providence is on our side, and that we have the good judgment to make the proper decisions to serve the needs of our international clientele.

Thus, we began to investigate—to read, to study, to listen, and to discuss—all from the viewpoint of a highly-specialized national research library; a library which holds well over a million volumes, and in which our subject "Agriculture" is interpreted in its broadest sense to include not only technical agriculture but also such fields as Botany, Zoology, Forestry, Agricultural Economics, Rural Sociology, Home Economics, and so on. Final decisions have not been reached; but the reading, studying, listening and discussion have led me to think about the myths which have developed about subject indexing, regardless of whether that indexing is done for card catalogs, printed bibliographies, or for tape, drum, or disc bibliographies. The myths are not confined to alphabetic subject indexing, so I shall go a little further afield.

It is no myth that scientific publication has grown by leaps and bounds since World War II, and that improvement in handling of scientific and technical information is of vital importance. As the Director of our Library, Foster E. Mohrhardt, has stated:

"Inadequate access to scientific information is the friction that impedes, complicates and leads to duplication in scientific research and development."[1] This is a matter of deep concern at the highest governmental level as evidenced by the President's Science Advisory Committee in its report on *Science, Government, and Information,* familiarly known as the "Weinberg Report."[2] The actions of its Committee on Scientific Information provide further evidence, going all the way from requesting a focal point for scientific information in each executive agency of the government to standardizing microforms produced by government offices. The myths appear in some of the ideas, plans, and methods proposed or developed to improve the handling of scientific and technical information.

Problems Solved

First and foremost, I place the myth that the problems presented by alphabetic subject indexing have now been solved by other methods of indexing. Our latter-day saints in the indexing world, those such as Taube with his coordinate indexing, Ranganathan with his colon classification, Coates with his chain indexing, and Shera with his exhaustive and specific indexing, would have us believe that their solutions are superior to the direct alphabetic subject approach. These solutions, mind you, require an alphabetic approach of some kind in order to use the solution. Even coordinate indexing has had to turn to the use of the alphabet. The general theme seems to be that alphabetic

subject arrangements are illogical and dispersive and that classification and/or coordination of terms retrieve more efficiently the literature of a subject. Classification advocates argue that ideas which cannot be expressed in ordinary language can be better expressed through classification symbols—of course, words are needed to explain these symbols. The need for expressing new concepts, the difficulties of setting up new subject headings, or changing old ones, the order of words used in phrase headings, the form of phrase headings, and the use of subdivisions are all pointed to as valid reasons for abandoning alphabetic subject headings. Yet it still remains to be proved that any of the new systems meet the needs of a large collection as well as, or any better than, alphabetic subject headings. In fact, just the opposite may have been proved by the ASLIB Cranfield Research Project. In its first comparative test of the efficiency of the Universal Decimal Classification, the alphabetic subject index, a special facet classification, and the Uniterm system of coordinate indexing, no appreciable differences in effectiveness of the systems were found.[3]

A new study to be watched is that of the University of Chicago. This is a project "to illustrate the use of a number of indexing systems on a common example of scientific documents. [It] is expected to provide insight into important characteristics of different systems for representing the subject content of scientific documents and to facilitate qualitative comparisons of them."[4]

Another common assumption is that an alphabetical approach is suitable for the non-research user, but a classified approach suits research needs better. The experience of our Pacific Southwest Forest and Range Experiment Station is pertinent to this. Their library departed from the normal alphabetic subject catalog used by our field libraries and adopted the Oxford system of classification for Forestry in order to provide bibliographic services in support of research without building up a large collection of publications. The Oxford system is a special expansion of the forestry number in the Universal Decimal Classification. The library subscribed to the Centralized Title Service of the Commonwealth Forestry Bureau. This service supplies a 3 × 5 inch card for every article scanned for possible inclusion in *Forestry Abstracts*. The cards, and there are a huge number of them, are filed in a classified catalog which has syntactical signs. The librarian reports that the foresters at this station are not using the classified catalog.[5] This, in spite of efforts to promote the system. In order to encourage use of the classified catalog, the librarian is constructing an alphabetic key of American forestry terms to the Oxford system, similar to what has been done by the American Meteorological Society for *Meteorological and Geophysical Abstracts*. How successful this will be, we do not know.

Use studies of scientists' reading habits show that the scientist's approach to a catalog is ordinarily for a specific work. But as Carlyle Frarey pointed out in his work on *Subject Headings*,[6] these studies have

been concerned with questions of "how" and "how well" rather than with "why." They have given no significant information about the user's needs in consulting a catalog. The scientist does, however, use a subject approach to consult other kinds of bibliographic tools. To say that he is helped more by going to an alphabetic key to a classified bibliography before he consults the bibliography, than by going directly to an alphabetically arranged subject bibliography is making an assumption that I cannot accept. It is evident, at least to me, that our old problems are still with us.

Automation

A great deal has already been written and said about how far we have to go in developing systems and machinery in order to make automated systems become economically feasible and useful tools for information storage and retrieval. And yet the myth persists that libraries can be fully and economically automated now. Hearing Don Swanson's speech at last summer's conference of the University of Chicago Graduate Library School and reading Gilbert King's report on automation of the Library of Congress impressed me with their similar emphasis on the importance of human beings and their different viewpoints on the uses of machines. Swanson in discussing the user's approach to the catalog by means of a console, pointed out that through the console, the user should be able to search the collection for a specific work and for works on a subject, obtain printed copies of journal articles from multiple titles and names of people who have requested similar materials to enable personal contact, and be able to browse through the collection. His speech made me long for the day this can be true. He concluded that there is:

> Need for new kinds of equipment more economically suited to an extraordinary high ratio of the amount of information stored to that processed.

and that:

> Applications more complex [than looking for a specific work] are probably necessary in order to make automation economically attractive.

Finally he said:

> Those operations within libraries which can be reduced to 'clerical' or 'formal' routines are susceptible of mechanization, while those which require professional training and hence the exercise of human judgment or intellect cannot be mechanized.[7]

The King report, reaches the following conclusions among others:

> Automation of bibliographic processing, catalog searching, and document retrieval is technically and economically feasible in large research libraries.

It goes on to say:

> The retrieval of the intellectual content of books by automatic methods is not now feasible for large collections, but progress in that direction will be advanced by effective automation of cataloging and indexing functions.

In elaborating on the first of these conclusions, King explains that:

> At the outset only catalogs, inventory files and indexes should be considered for automation. Even here, to use these in a sophisticated manner, it may be necessary (and there should be no reluctance) to insert manual processing and human decisions when they are essential or too expensive to replace.[8]

Note that both King and Swanson call for human judgment or human decision, and that they both acknowledge that at this stage in the development of automated systems, indexing decisions cannot be taken over by machines. These decisions, regardless of the index method to which they are applied (alphabetic, classified, or automated) are similarly fallible and similarly subject to human interpretation and to human error. Even so, human decision is one function which cannot be taken over by machines as developed up to now.

Note too, that where Swanson suggests that functions such as searching for a specific work is not a complex enough application to make automation economically attractive, King concludes that automation for bibliographic processing, catalog searching, and document retrieval is economically feasible in large libraries. This is especially interesting since Swanson was a member of the Library of Congress survey team of which King was the Chairman.

Suffice it to say that we still have a mighty long way to go to automate subject indexing. Ralph Shaw summed up the automation situation neatly in *Science* last spring when he wrote:

> If computers can retrieve information more efficiently than it can be retrieved by other methods, we ought to be using them more widely. If they cannot, then in the interest of service to scholarship—whether in science or in other fields—we should stop making irresponsible claims for these systems, regardless of whether the claims are made by librarians, information officers, documentalists, government officials, administrators, engineers, scientists, or others.[9]

Depth Indexing

Now let us take a look at the myth of the high value of depth indexing. The first ASLIB Cranfield Research Project study to which I referred earlier discovered that there was no appreciable difference in the retrieval or recall capabilities of the four systems studied. The results of the first test led to the next study by Cyril Cleverdon and his team, a study to determine not only recall of material, but relevance of the material recalled. It was felt that recall by itself was an inadequate measure of performance. This second study is pertinent to the myth of depth indexing. Only two systems were tested in this go-round, the manual facet catalog of the English Electric Company and Western Reserve University's Index to Metallurgical Literature. The Western Reserve system is a deep indexing system based on conventional abstracts, telegraphic abstracts, and role indicators in which all terms are translated into code mechanically. The whole abstract with all of its characters and phrases is converted into the language of the com-

puter. Each document selected for the experiment averaged 12½ entries in the facet catalog; the Western Reserve system averaged 30 terms per document. In the latter, if the role indicators were counted as separate terms, the average number of entries would have been 60. The report on this test revealed that the Western Reserve system's "striving for perfection resulted in an operating performance which was no better than that of Cranfield's facet system and an economic performance which, clearly, compared very badly." Jean Aitchison and Cyril Cleverdon went on to say:

> Probably the most important factor in the present operating performance of the Western Reserve system is their level of exhaustivity of indexing.[10]

The authors conclude:

> This test confirms the practically total lack of importance of the arrangement of terms in the index language. Many working in the field of information retrieval believe that a new classification, 'association of terms' or similar idea will be the philosopher's stone that will transform the dross of present techniques to the pure gold of perfect I.R. systems.[11]

Interestingly enough, from this study a clear picture of the inverse relation between the factors of recall and relevance was found. In their article about the study which appeared in the February, 1964, issue of *Special Libraries,*[12] Cleverdon and his associates reported that once an optimum level of performance had been reached, any device added to the system to improve recall must inevitably reduce relevance; any device added to improve relevance must reduce recall. Key factors were found to be specificity and exhaustivity of indexing and searching. The research team stresses that specificity of the index language makes for higher relevance and lower recall, and specificity depends on the indexing vocabulary. They stress too that exhaustivity depends on decisions made by the indexer rather than on the vocabulary of the index. Again in this article, the authors confirm that:

> *Given the same vocabulary,* any two systems should be capable of operating at about the same level of efficiency; any discrepancy in their performance due to actual file arrangement is not likely to make more than a one percent difference to either recall or relevance figures for the system. . . . This refers to index *performance,* not over-all economic efficiency. The latter must consider further factors, such as ease and convenience (to librarian and user) of assembling, maintaining, and operating a system.[13]

The Cranfield Project is now engaged in research on index language devices to determine their precise impact on recall and relevance—devices such as role indicators, coordination of terms, and weighting of terms which the investigators feel improve relevance and reduce recall, and devices such as multiple hierarchical linkage and synonym control which they believe improve recall and reduce relevance. It will be interesting if the Cranfield staff next undertakes another truly comparative study to test the efficiency of the four original systems: alphabetical subject, Universal Decimal Classification, facet classification, and co-

ordinate indexing, in the light of what they have learned from the previous studies.

Another kind of deep indexing should be mentioned briefly, even though it it not subject indexing—the new *Science Citation Index*. This index, and let's forget about the cost and the atrocious, hardly-legible print, gives approximately one and a quarter million cited references for just the year 1961. Its arrangement is alphabetical by author with no subject approach. Compound the number of references for a period of years, and I think it becomes self-evident that a subject approach becomes an absolute necessity. Any scientist who wishes to use the index is rarely interested in all of the citations to any article, but he *is* interested in those citations which pertain to his own specific interest, need, and viewpoint at the particular moment he goes to the index. The tests of the *Science Citation Index* which will probably take place, the decisions arrived at, and the bases for these decisions should be meaningful to all of us involved in subject indexing. The Cleverdon studies have pertinence for indexing systems, and here is an opportunity to put the findings of these studies to work in developing a new index.

We might also consider this paper in relation to depth indexing. In the first place, how deep an index would it have taken to pinpoint what to me are some of the myths in subject indexing? Here is where author's interest, need, and viewpoint are of significance. Could I, or indeed should I, have expected any index to gather together for me just those documents which I finally decided were important for this paper? No index, however exhaustive, could have led me directly to only those publications which I finally selected. Depth indexing could have either made me miss something I wanted, or could have drowned me in the prolific flood of library literature.

Let's turn to the other side of the coin. When this paper is published, suppose some library or information center which uses a deep indexing system incorporates the paper into its collection. I have mentioned the National Agricultural Library, coordinate indexing, faceted classification, and colon classification. Surely each of these would have to be brought out in the deep indexing system. Fine, so far. But what happens when some earnest body wants a history of the National Agricultural Library, or an explanation of faceted classification, colon classification, or coordinate indexing? The deep indexing leads him to this paper, which upon examination, turns out to be just a lot of "noise" from that poor user's viewpoint.

Thus from either viewpoint, mine when gathering background readings for this paper, or someone in need of specific information after the paper has been published, deep indexing fails to meet the needs. In writing about classification systems, Ralph Shaw made a statement which I believe is as applicable to subject indexing as it is to classification systems: "Our needs differ from situation to situation and from task to task as well as from person to person and from place to

place."[14] Whether we are pure scientists, social scientists, documentalists, engineers, librarians, or what have you, deep indexing and exhaustivity cannot give to us quickly and easily everything we need, at the time we need it, from the exact viewpoint we need it—in other words, it cannot be all things to all people. I question whether it can be all things to some people. I'll go a step further. Should we expect any indexing system to meet every demand made by every inquirer? My answer is No! But we should expect our own indexing system, along with the important published tools from other systems, to meet the needs of our own users.

Subject Heading Lists

Another myth is that a universal subject heading list can be developed, or, if not, that individual subject heading lists, each devoted to a different discipline, can be made completely compatible, giving us in effect a universal list. Efforts are being made now to determine the validity of this. I shall go into that a little more in a moment, but first I want to digress to bring up the myth that subject headings needed to catalog a book are different from subject headings needed to index a periodical article.

Is this a myth? I believe it may be. In the preliminary edition of the *Subject Heading List* of our Library, published in 1963, I have listed a number of projects which we wish to study. Among these is:

> Study the subject headings currently used in the *Bibliography of Agriculture* to determine the feasibility of producing a combined, revised list of subject headings to serve the needs of agricultural card catalogs and published bibliographies, whether produced manually or by machine.[15]

As a part of the project we want to find the best arrangement for the revised edition: alphabetical as it is now, categorized, or both? Although we have been eager to go to work on this project, for a number of reasons we have been unable to proceed.

The National Library of Medicine adopted a single subject authority list for cataloging books and indexing periodical articles in 1960 when the first edition of *Medical Subject Headings*[16] (popularly known as MeSH) was published. This list was a tightly-controlled alphabetical list. The Preface to the 2d edition of MeSH published in January 1963 states: "We are convinced of the value of using an identical authority list for the indexing of periodicals and the cataloging of books."[17] For the first time, a categorized list of subject headings appears as an appendix in the second edition. The 3d edition of *Medical Subject Headings* published in January 1964[18] reaffirms the use of a single subject heading list for periodical indexing and book cataloging. The list is still tightly controlled and in alphabetic arrangement, with an appendix which categorizes the subject headings. It is my understanding that due to MEDLARS, it is expected that the list of subject

headings may be greatly expanded. If this is done, I am eager to learn what will happen to the categorized appendix.

Another example of a single subject authority list for cataloging books and indexing periodicals is the *Thesaurus of Descriptors* developed under the guidance of Jack Hilf and recently issued by the Bureau of Reclamation.[19] The main part of this list is made up of an alphabetical list of descriptors, followed by a list of 47 descriptor groups which include each descriptor, and this in turn is followed by a list of broad descriptor fields which include each descriptor group. The system is used to index documents for the Bureau's selective dissemination system, for its quarterly abstract bulletin, and for the Library accession list. It is also used to index the interest profiles of selective dissemination recipients and to develop a printed index which supplements the catalog cards for subject retrieval of library documents. It is just now beginning to be used for library cataloging purposes.

Traditionally, lists of subject headings are alphabetical, and different lists have been used for book cataloging and for periodical indexing. The reasons given include new ideas which do not yet have a preferred terminology, and more specific indexing is required for periodical articles since they deal with more specific subjects. I wonder if this is necessarily so. Can a single list be used for multiple purposes by laying down rules for its use? Are categorized lists important enough to warrant the time and effort it takes to prepare them? In a large list, such as that of the National Agricultural Library which includes over 90,000 entries, can the terms be uniquely categorized, or should they be? Questions such as these must be answered to prove or disprove whether separate lists are needed for periodical indexing and for book cataloging.

Now to return to the subject of the universal subject heading list. A survey of current thinking makes it fairly evident that this is considered a non-attainable goal, and, furthermore, that it is doubtful if this should even be a goal. But there is definite interest in the possibility of making different subject heading or indexing lists compatible with each other. A case in point is the interest of the Committee on Scientific Information of the Federal Council for Science and Technology which has generated and followed closely studies and developments in this area.

A recent Datatrol Corporation study concentrated on how a common vocabulary might be involved in the announcement, distribution, and indexing of open government research reports when the nature of the reports remained the same, the interests of the various agencies remained the same, and the agencies retained their own techniques for indexing the literature. This study was devoted to subject heading lists of agencies dealing with and interested in the same subjects; the agencies involved were the Defense Documentation Center, the National Aeronautics and Space Authority, the Atomic Energy Commission, and the Office of Technical Services. Let us look at some of the conclusions reached in this report:

1. Neither a single thesaurus, a single subject heading list, nor correlated thesauri, offers any significant advantage over current vocabulary displays of the operating agencies for announcement or for 'simultaneous searches of multiple collections.'

2. Where the interests of different agencies coincide or overlap, their indexing of common subject matter will be recognizably similar and there will be little difficulty in converting one vocabulary to another for information retrieval—by machine or manually.

3. Where the interests of different agencies do not coincide, their indexing will be dissimilar, regardless of the vocabulary available.

4. Even in agencies where the avowed policy is to use a rigidly controlled vocabulary, indexers will vary considerably in their selection of indexing terms to describe the document content.

5. A common subsumption scheme superimposed on the indexing data of the different agencies would inject a significant degree of commonality among the announcement publications of the operating agencies. Such a scheme would also provide the base, or frame work, for deriving indexing equivalents by computer for simultaneous searching of multiple collections.[20]

The lists examined were either subject heading lists or thesauri, and all of them used an alphabetic approach; three of the lists included category lists also. Even with interest in the same subjects by all of the agencies involved, development of a common subject heading list was not found to be practical or desirable because of differences in the broadness of coverage of the various agencies, the different viewpoints and depths of indexing of the various agencies, and the inconsistency in human indexing. But even so, a superimposition of broad subject categories is suggested for announcement purposes and to provide a framework for deriving indexing equivalents by computer for searching multiple collections.

Experience in a national library environment led me, at one point, to feel that a governmentwide alphabetical subject heading list should be developed. Since the subject heading lists of the three national libraries are alphabetically arranged, and since between them they pretty well cover the entire field of knowledge, I thought it might be practical to publish one subject heading list which would include the subject headings used by the Library of Congress, the National Library of Medicine, and the National Agricultural Library. This, it seemed to me, would give libraries and other bibliographical institutions an invaluable tool for indexing purposes. This monumental work would identify which headings were used by which of the libraries, and would point out where practices differ. It took just one short meeting with Library of Congress staff members to convince me that if such a work were produced, it would be exceedingly difficult to use, that special libraries prefer to use special lists, and that combining the lists would serve no useful purpose. Putting these lists together to produce one list would have been similiar to combining automobiles and peaches to produce a pie. Whether the lists could be compatible with each other is another question.

Challenge

I have spread the limits of the topic alphabetic subject indexing to discuss a few of what I call myths in the field of subject indexing. No doubt, each reader has other myths in mind or quarrels with what I call myths. This is all to the good, for it points up the need for either exploding the myths or proving them to be facts. There is a continuing need for defining our problems, for determining the basic causes of our problems, and for investigating various approaches to see if we can find solutions to our problems. Please note that I call for solutions in the plural. Much as I believe in uniformity and standardization for certain purposes, I do not believe that the same solutions should necessarily be applied to cope with the varying needs of our various situations. We live in exciting times when experimentation and research in the field of information storage and retrieval are recognized as vitally important, not only within our own professions, but by the world at large. The challenge is with us now: To get and keep current with indexing the prolific flow of literature in order to supply what is needed, when it is needed, in the form it is needed, to the particular individual or group whom we serve. Through experimentation and research, without neglecting the alphabetical approach to subject indexing because of its familiarity, perhaps we can look forward to approaching Utopia which I define as: The happy marriage of research, sound judgment, and indexing ability to the fruits of our modern technology from which the offspring will be the solutions to our problems.

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Serials Record Instructions for a Computerized Serial System

TED F. SRYGLEY, *Assistant Librarian-Acquisitions*
Florida Atlantic University, Boca Raton

FLORIDA ATLANTIC UNIVERSITY has been established as a state university committed to experimentation, and the FAU library is perhaps unique in this country in its development of a library data processing system. Our concern with these techniques stems from the work of Librarian Edward Heiliger in the area of library data processing. We are building a total library system—both the technical and public services divisions are developing applications which will save time, money, and manpower as the library expands and develops services.

Data processing techniques applied to serials operations eliminate much of the tedious detail and guesswork involved in a traditional system. The successful manipulation of data by an IBM 1460 computer depends on the accuracy of the data and the adapting of programs to needs. Most serials have a high degree of predictability, which is a prerequisite for data processing. The small percentage of serials which are irregular are handled on an individual basis but still within the system. This article briefly explains the computerized serial system and shows in detail the coding of input data. The serials system, as it develops within the overall library system, consists of related programs which function from Serials Record Card input data.

Orders for serials are computer-produced in lists arranged by vendor. These lists are screened by the Serials Librarian and are then put in the normal procurement channels. New orders in large quantities are placed after completing all of the available information on the Serials Record Card and inputing to the computer.

When issues of serials are received, the Serials Clerk sorts them alphabetically and compares title, issue, and volume number with IBM cards in a tub file. Each incoming journal has a corresponding computer-produced IBM card. This is an anticipatory system in that it assumes regularity based on past performance of the journal. Flexibility is built into the computer program so that when a maverick issue arrives, a new claim card is punched and the computer adjusts itself accordingly.

Check-in cards for issues received are sent to the Data Processing Center each day for internal updating of the Current Serials List and the Total Holdings Record. The Current Serials List is printed three times a week; the Total Holdings Record is printed semi-annually. The journal issue is date-stamped, marked with a serial number or coded for a classification number, and sent either to the shelves, or to the Cataloging Department, through the Selective Dissemination Information (SDI) program when appropriate.

Journals are not routed in the FAU Library; instead, each faculty member indicates those journals whose tables of contents he would like to examine. This is coded into the Serials Record Card and appears on the check-in card. A Xerox 914 is available in the Technical Services area. The clerk sends selected journals to be Xeroxed and then shelved; the Xerox copy of the table of contents is sent to the faculty member. Since the Library is in a central location on campus, the journals are easily accessible.

Cards left in the bin after check-ins are removed are potential claims and are sent to the Data Processing Center for input computer. Output is a letter to each vendor listing issues not received. These letters are examined by the Serials Librarian prior to mailing.

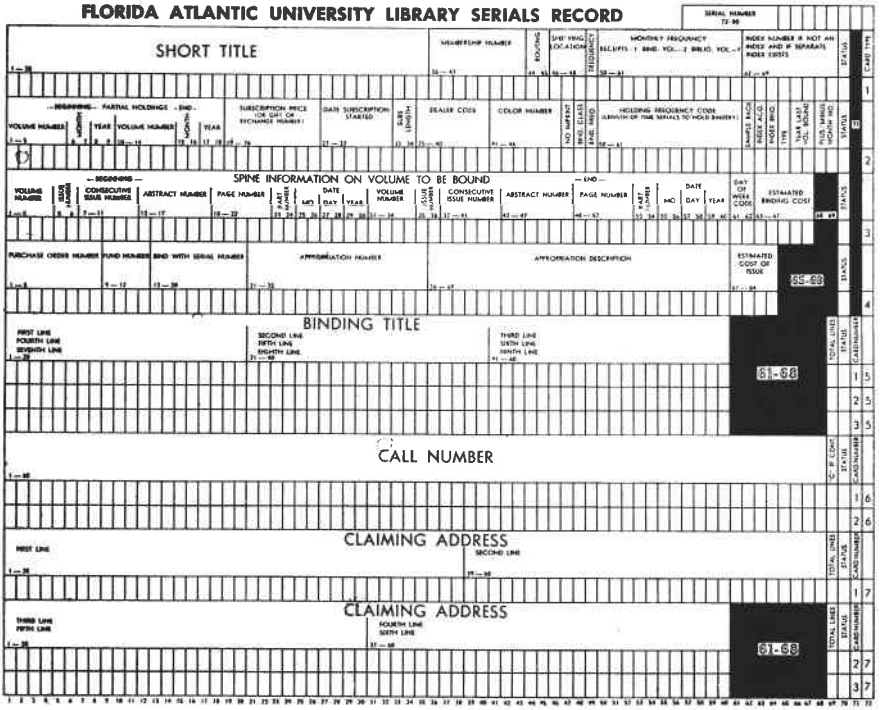
A Current Serials List is published three times a week and is posted throughout the library. It identifies the most current issue of each serial and the expected date of the next one. The total holdings are automatically updated in the computer at the end of the day an issue is checked in.

The Total Holdings List is printed semi-annually. It consists of title, location, the serial or Library of Congress classification number, and the type of holdings; i.e., microfilm, microfiche, etc. This list is a supplement to the printed library catalog. A Serials Subject List is printed periodically. Serials in this listing are arranged by subject headings found in *Ulrich's Periodicals Directory,* plus those additional ones necessary for Florida Atlantic University.

Our solution to the problem of binding larger runs of journals is not in the realm of computers but in microformats. Journals are kept in Princeton files during the period of their greatest use, then discarded in favor of microformat when available. Studies are being done now concerning the relative merits of the various microformats, from the point of view of document and information retrieval as well as user-convenience. Indexes and abstracting tools are kept in physical format only. A program of binding for these serials is being developed which will simplify the attendant clerical processes.

Miscellaneous lists can be arranged by any piece or combination of data in the Serials Record Card. The possibilities of service are limited only by the ingenuity of the Librarian-Programmer and the extent of source data he has to work with. The serials system has the flexibility needed to fill, in a short time, requests for lists and information that in a traditional system would cause havoc.

The Serials Record Card was developed as a result of the research done by Louis A. Schultheiss, Don S. Culbertson, and Edward M. Heiliger and reported in their book, *Advanced Data Processing in the University Library* (New York, Scarecrow Press, 1962). It has been adopted because it is fairly complete, and because of a desire to establish common data and techniques with other libraries. A set of instructions has been developed to complete the data in this card. Each row of card columns represents an IBM card which is key-punched and transferred to tape. The Serials Record Card is nothing more than a transmittal sheet, and loses its value once data is in core storage. This card and the instructions for its use are reproduced here so that other libraries considering automation may benefit from it.



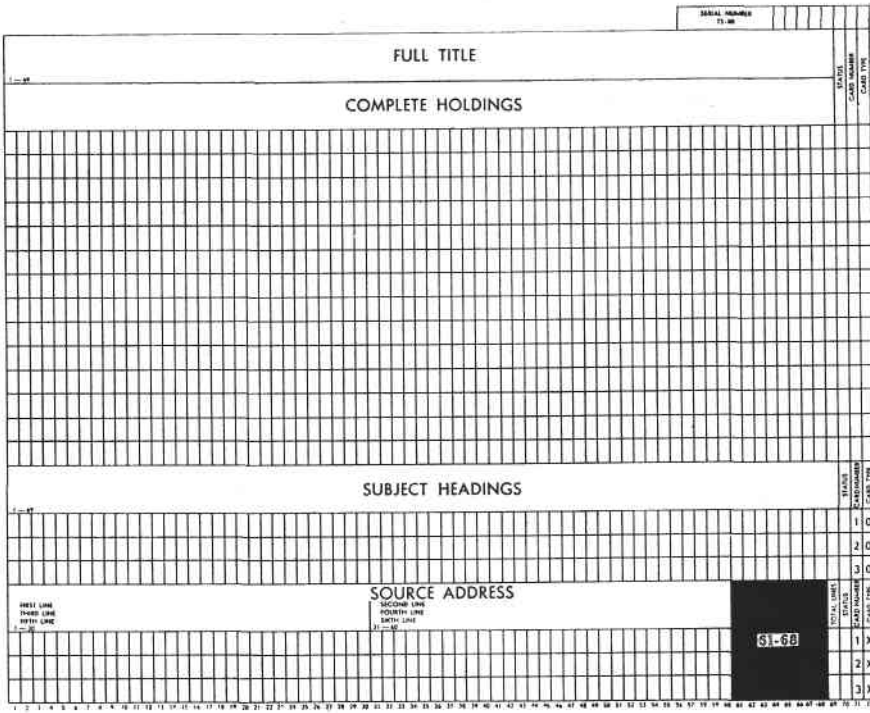
Recto of Serials Record Card

Description of the use of columns on the Serials Record Card

IBM CARD 1

Card column

1-35 Short title: Generated by abbreviating cover title with abbreviations used in *American Standard for Periodical Abbreviations* (ASA 239.5-1963).



Verso of Serials Record Card

36-38 Miscellaneous data: This code is for internal use only and is intended to reduce the necessity for notes on the Serials Record Card.
39-43 Membership number: Assigned by referring to membership list.
44-45 Routing list: Assigned by referring to routing list.
46-48 Shelving location: Assigned by referring to shelving location list.
49 Frequency: The following code is assigned to refer to receipts.

0—Daily
1—Daily except Sunday
2—Daily except Saturday
3—Daily except Saturday and Sunday
4—Weekly
5—Biweekly
6—Twice per month
7—Monthly
A—1 per year
B—2 per year
C—3 per year
D—4 per year
E—5 per year
F—6 per year
G—7 per year

H—8 per year
J—9 per year
K—10 yer year
L—11 per year
Z—Irregular or unscheduled

50-61 Monthly frequency: Each card column in Card 1, cc50-61 represents a month (January-December). If a serial is received during a given month, this is indicated by 1 in the card column. If a bibliographic volume is completed during a month, this is indicated by 4. The resulting code would be 5 (1-receipt and 4-bibliographic volume =5). If a binding volume is completed, this is indicated by 2. Annuals (Frequency A) are coded as 5.

1 — At least one issue received in a given month.
2 — Binding volume completed.
4 — Numerical volume completed.
— — Less than the normal receipt during the month. Example: 1^-
+ — More than the normal receipt during the month. Example: 5^+

The use of plus and minus signs gives flexibility to the frequency code and adjusts for such minor peculiarities as supplements. The only frequency digits permitted are 1, 3, 5 and 7.

62-69 Index number: Serial number of the index of the serial if the index is treated as a separate title. A Serials Record Card is completed for each index received separate from the serial.

70 Status: Used to add or delete information or insert an original card. All existing data on the individual card must be completed.
0 — Insert
1 — Update
2 — Delete

71 Not used.

72 Card type: Always punched as Card 1.

73-80 Serial number: Increments are initially derived by dividing 99,999,999 by the total number of serials to be assigned. Each new serial is assigned a number to reflect its alphabetical sequence. To derive a new number, locate the new serial alphabetically, and assign a number mid-way between the preceding and following number.

IBM CARD 2

(CC 1-18: Partial holdings—beginning and ending volumes)
1-5 Volume number
6-7 Month (01, etc.)
8-9 Year (63, etc.)
10-14 Volume number
15-16 Month
17-18 Year
19-26 Subscription price: Or, write GIFT or EXCH or DEPO (Depository) if not purchased.

27-32 Date current subscription started (month, day, year)
33-34 Subscription length in months
35-40 Dealer code: Assigned by referring to Dealer list
41-46 Color number: Assigned by binder
47 No imprint: Punch 1 if library ownership imprint is not to be made on spine by the bindery.

48 Binding class code:
- 1 — Class A
- 2 — Class B
- 3 — Class C
- 4 — Class D
- 5 — Current year only
- 6 — Publisher's binding
- 7 — Microfilm (roll)
- 8 — Microfiche
- 9 — Microcard

49 Binding frequency (if yearly or less). Use year of last bound volume (cc 66-67) to figure year next volume is to be bound.
- 0 — Every year
- 1 — Every odd year
- 3 — Every third year
- 4 — Every fourth year
- 5 — Etc.

50-61 Holding Frequency Code (January—December). Number punched in column for current month indicates how long to hold binding volume. Example: A 5 punch in cc 52 means to hold the volume which is to be completed in March until May.

62 Sample Back Code (binder's information)
- 1 — First time bound
- 2 — See sample back
- 3 — See old cover
- 4 — Rub sent
- 5 — See pattern
- 6 — Change sample back

If 1 on first use, change to 2 on second use.

63 Index acquisitions code. This information will be given on the Serial Record Card for both the index and the serial.
- 0 — Ignore.
- 1 — In last issue with volume.
- 2 — Loose, free without request.
- 3 — Loose, free upon request.
- 4 — Loose, purchase.
- 5 — In issue of the next volume.

64 Index binding code: This will also appear in both records:
- 1 — Stub for index
- 2 — Bind as separate
- 3 — Received bound from publisher

65 Type of serial:
- 1 — Dead
- 2 — Live, not from a membership
- 3 — Live, from a membership

66-67 Year of last bound volume(s)

68-69 Plus or minus month (or weeks) number. If serial is semi-monthly or less frequent, enter number of months serial is received before or after publication date. If serial is more frequent than semi-monthly, this code is stated as weeks. Examples: Weekly journal published on Saturday but received 3 weeks late is coded as 03-. Monthly journal received 1 month early is coded as 01+.

70 Status

71 Not used

72 Card type number (2)

73-80 Serial number: Preassigned

IBM CARD 3

(CC 1-60: Spine information for volume to be bound)

1-4 Volume number: Use volume number if present. If there is no volume number, use year (e.g. 1963)

5-6 Issue number: Use only if consecutive within volume number.

7-11 Consecutive issue number: Use only if there is no issue number. Use in conjunction with year as volume if there is not volume number.

12-17 Abstract number.
18-22 Page number.
23-24 Part number.
25-26 Month
27-28 Day
29-30 Year
31-34 Volume number.
35-36 Issue number.
37-41 Consecutive issue number.
42-47 Abstract number.
48-52 Page number.
53-54 Part number.
55-56 Month
57-58 Day
59-60 Year

61-62 Day of week or month code: Refers to Card 1, CC 49 (Frequency).
- 1 — If biweekly or more frequent: Use 01-07 to refer to day issue is received (Sunday through Saturday).
- 2 — If twice per month or less frequent: Refer to day of month (01-31) issue is received.

63-67 Estimated binding cost: Last actual cost will be the next estimate.

68-69 Not used

70 Status

71 Not used

72 Card Type Number (3)

73-80 Serial Number: Preassigned

IBM CARD 4

1-8 Purchase order number
9-12 Fund number
13-20 Bind with serial number. Refers to the index serial number if it is separate.
21-35 Appropriation number
36-60 Appropriation description
61-64 Estimated cost of individual issue. Last actual cost becomes the next estimate.
65-69 Not used
70 Status
71 Not used
72 Card type number (4)
73-80 Serial number: Preassigned

IBM CARD 5

1-60 Binding title. A maximum of nine lines of twenty characters each has been allowed. If more than three lines are needed, a second card is required. If more than six lines are needed, a third card is required.

First line (Fourth and Seventh line)
Second line (Fifth and Eighth line)
Third line (Sixth and Ninth line)

69 Total lines
70 Status
71 Card number

1 — Lines 1-3
2 — Lines 4-6
3 — Lines 7-9

72 Card type number (5)
73-80 Serial number: Preassigned

IBM CARD 6

Call number: The call number can take up a maximum of ten lines. If second card is used, place C in cc69.

(CC 1-20 Line character count: Allowance has been made for 10 parts.)
1-2 Count for the first line of call number
3-4 Second line
5-6 Third line
7-8 Fourth line
9-10 Fifth line
11-12 Sixth line
13-14 Seventh line
15-16 Eighth line
17-18 Ninth line
19-20 Tenth line
21-22 Total character count in all lines
23-68 Call number

69	C if continued onto second card
70	Status
71	Card number (1, 2 or 3)
72	Card type number (6)
73-80	Serial number: Preassigned

IBM CARD 7

Claiming address: This address can use a maximum of six lines on three cards. If the address uses more than two lines indicate card number in cc 72.

1-38	First line
39-68	Second line
69	Total number of lines in address
70	Status
71	Card number in set. Maximum of three.
72	Card type number (7)
73-80	Serial number: Preassigned

IBM CARDS 8 AND 9

NOTE: When this address is continued onto second or third cards, each additional line is alloted 30 spaces. 38 spaces is only for line one.

The reverse side of the Serials Record Card is a continuation of the front and is part of the same tape. It indicates title, complete holdings, subject headings, source address and serial number. The complete title is given even though this may duplicate information on Card 1. The card is numbered as Card type 8, Card number 1, 2, 3, etc. depending on how many lines are needed to establish the full title.

Complete holdings begin on the line (card) following the title. This card is designed as Card type 9, Card number 1, 2, 3, etc. Holdings are summarized up to the time the computer program began. After this date, holdings are automatically updated by the computer.

Subject headings are assigned by the Serials Librarian.

Source address is usually the vendor and is completed in the same way as the claiming address on Card type 7.

The serials system at Florida Atlantic University is developing rapidly in order to serve students and faculty in September, 1964. Three of the staff have learned to program for the IBM 1460 Computer, and this combined knowledge has stimulated new ideas. We expect to report cost and service studies quite accurately as the system swings into full operation, but results to date have been quite encouraging. The potential of the system is great—we intend to creatively utilize that potential.

Combined Procedures for Technical Processes

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A NUMBER OF different approaches are being tried at the University of Kansas to cope with the deluge of printed materials we must acquire. This summary describes some of these adaptations of photography, Xerography, and offset printing to our particular problems. The individual ideas are not all original with us, but we do claim to have found ways to combine them effectively. A summary of our experience with costs appears near the end of this article. If more information is desired, specific questions may be addressed to this writer, who coordinated the innovations as Head of the Preparations Department during the period of experimentation.

The University of Kansas Libraries

Now grown beyond their first million volumes, the University Libraries, including Law, are centered primarily on the Lawrence campus, with only the Medical Center and School of Social Work libraries located in Kansas City, Kansas. Beginning with the usual division of public services and technical processes, the latter are then divided between the Acquisitions and Preparations departments. These departments serve not only the main general library (Watson) which contains in its stacks about 60% of the total volumes, but all of the other libraries located in Lawrence as well as the Social Work collection.

There are at least eleven of these libraries which are supplied with full duplicate sets of catalog cards from the centralized services of the Preparations Department. The original sets of cards are filed in the main public catalog in Watson. It will thus be apparent that Kansas, faced with a growth rate of above 40,000 volumes a year, was in an advantageous position because of this centralization to provide the volume needed for effective use of some equipment for copying slips, cards, and other library records.

Microfilm Camera

The central piece of equipment in use for these operations is a Recordak Microfile camera, Model MRD-1, which was delivered in February, 1961. This planetary camera was first rented from the branch office of Recordak in Kansas City, and later purchased when the experi-

ments satisfied our expectations. Although it will accommodate either 16mm. or 35mm. film, we have used 16mm. film exclusively. Earlier experiments were made using a Recordak Junior combination camera-reader, Model JC, which proved that it would be satisfactory to copy thin materials at a fixed reduction. The greater flexibility of the MRD-1 lies in its easily-adjustable reduction, focus, and lighting, permitting the copying of a much wider range of materials, including books of varying thickness. The MRD-1 is now available only as a used machine. The MRD-2 camera has replaced it, the principal change being a more convenient mechanism for raising or lowering the camera head. The JC rented for $25 a month, the MRD-1 for $90, and purchase of the latter reduced from $2,595 to a minimum of $2,315 after 6 months' use. Loading and operation of the camera are quite easy, and minimal training is required for our library assistants. If much book copying is contemplated as an additional use, a used Recordak Model D (the predecessor of the MRD-1) should be investigated as a better machine. All processing is handled through the mail by the Recordak technicians in Kansas City. Two guide lights and a single meter are adjusted on the camera to insure the proper field, focus, and illumination. Development of the 16mm. film is included in its cost, $4.90 per hundred feet. Electrostatic prints are prepared as a continuous roll of paper on a Xerox Copyflo Printer at the Recordak agency. Costs of this service depend on the width and grade of paper or card stock, as well as quantity above a $20 minimum. The cost of the 5″ wide, .007″ thick, sulphite bond, which we find satisfactory for most temporary purposes, has ranged from $64.10 to $66.60 a thousand feet. When 3″ ×5″ originals are reproduced full-size, each foot ordinarily produces 3 prints, with interframe spacing.[1, 2]

Acquisitions Uses

In the Acquisitions Department, the three-part purchase recommendation has been the form most affected. Our present Director, Thomas R. Buckman, when he was Head of Acquisitions, designed a bristol-board mask, similar to a purchase recommendation, but with a window in the center, where the author, title, and imprint usually appear. This mask goes over entries in the *American Book Publishing Record (BPR), British National Bibliography,* and similar printed sources of order information. Three exposures are made of each item, and the resulting strip of three Copyflo Xerographic prints, returned by mail in two or three days from the processor in Kansas City, is then sent out to the potentially-interested faculty member. He may keep one-third as his personal record, returning two copies to the Library, one signed if the book is wanted. For those items returned, the information is typed onto a seven-part fan-fold form to create the actual order. The two photocopies are kept in Acquisitions until the book arrives, and then one is sent on with the volume to the Preparations Department, which, in this Library's usage, is responsible for brieflisting, cataloging,

and classification, as well as the usual processes of book preparation.[3] If the purchase recommendation was photocopied from *BPR*, the cataloging information provided by the Library of Congress is immediately available to the cataloger.

A holder with a hinged glass top was designed and built, so that masks for different jobs could be slid easily into grooves in the aluminum frame, beneath the glass, and lowered on slips and thin bibliographies. This holds the work to be copied flat, steady, and in focus. It also speeds up the process by showing the operator what area will be copied without repeated switching to subdued illumination to see the guide lights.

Other masks are used for claims on unfilled orders and for copying Russian citations in *Novye knigi*. Repeated calligraphy for claims made by our Far Eastern Collection is avoided with this same system. From the published bibliography of our Melvin Collection of pamphlets of the French Revolution, we have obtained individual entries for the public catalog.[4] The only limit to effective use of such masks is the imagination to see how a uniform portion of some variable existing records, combined with a new informational constant on the mask, can create a new record for another purpose.

Brieflisting

The same camera is used by Preparations to copy the purchase recommendations, which may be available in the books either as the photocopy mentioned earlier or as a carbon of the typed three-part form. This re-photographing is for the purpose of "brieflisting" all acquisitions as soon as possible after receipt. A distinctive location number is assigned each book and stamped on the slip. The same number goes on another slip placed in the book so that the number shows. The books are replaced on the shelves in Preparations in the order of these running numbers, which corresponds closely to the order of receipt. We abandoned accessioning in the 1950's, but have returned to it to the extent that we assign these numbers to each title as a relative location number, and the processed rolls of 16mm. film form our accession records.

The mask used for brieflisting gives a short explanation, including the necessary warning that the book needs time (about 48 hours) for complete processing before it is available for normal circulation. The Copyflo prints are trimmed and punched by the Library for filing in the main catalog and, where pertinent, in one or more of eleven branch public catalogs. In these outlying branch libraries, the brieflisting slips serve as records of the books' existence until they are cataloged. The numbers permit easy request of particular titles by telephone.

These methods of brieflisting by photography were an absolute necessity in gaining control over a back-log of many years' accumulation. They were the means by which we managed, in the words of Robert Vosper's last annual report at the University of Kansas, "with

no extra staff, to record in our public catalog 96,609 volumes, or about 63% more than in any previous year."[5]

Title-Page Photography

In cases where no photocopied or typed purchase recommendation already exists, we have in some cases photographed the title-page itself. The usage is modeled after a similar application at the New York Public Library, where, however, a modified Photostat camera is used instead of the combination of microfilm and Copyflo. An even earlier indirect antecedent was Henry Stevens' *Photo-bibliography*, first privately printed in 1868.[6] The author entry and the usual brieflisting mask legend, typed with an oversize typewriter face, protude from the fore-edge of the book. The title-page itself is photographed with a ninety-degree counter-clockwise rotation, so that the usually greater height of the book corresponds to the longer dimension of the catalog card which is produced. In examining such a card in the catalog, the same convention is observed as in maps or in drafting, that one reads to the right or toward the top. To reduce camera adjustments, the books are grouped in a few categories according to the width of the text, because this is the first dimension most likely to exceed the bounds of any particular photographic field proportional to the 3:5 ratio of the card. Regardless of the particular reduction, the film is enlarged to the same 5" width. Suitability for title-page photography thus depends on size of the original type as well as the area of the text. For these reasons, typescripts in the usual 8½" × 11" format are just beyond the range of satisfactory reproduction.

An improvement would be a spring-loaded book cradle, which brings each title-page up to a pre-focused level beneath a hinged glass cover. This would give the same advantages of faster operation as the mask holder previously described. Such cradles have, of course, been standard equipment in many library copying operations for years.

Aside from initial experiments, less has been done with title-page photography at the University of Kansas than at UCLA, which has adopted the system from our model with considerable improvement.

Precataloging

A team of library assistants "precatalog" the books, once they have been brieflisted, by searching for *National Union Catalog* copy. We have never subscribed to all proofsheets, and still prefer not to because of the amount of filing required, the small probability of success if we should start so late, and our large numbers of non-current books which must be searched in the several Library of Congress printed catalogs, anyway. Our percentage of success (up to 75 per cent) is equal to the usual receipt from Library of Congress when we obtained our own Multilith equipment and discontinued ordering cards. Now we use the Recordak camera and Copyflo prints of the catalog entries. No holder is used for the thick LC volumes, but a plain white mask with a column-

wide notch at the top is placed over the leveled page of *NUC*, framing the desired item. These items have been marked by the precatalogers with small pressure-sensitive disks, called Flag-its, and a paper bookmark upon which the brieflisting number has been written. The camera operator allows the number of bookmarks to accumulate until a reasonable job lot is ready, and then goes through all marked volumes. The Flag-its are removed and the item masked, with the numbered bookmark placed below the item, but within the field to be photographed. A small plate glass weight is added, the focus is adjusted and locked. The camera's field indicator is set to the borders of the notch. The operating lights are then turned on, the exposure made, the lights turned off, and the process is repeated for the next item. We film at a reduction ratio of 6:1 and an enlargement of 8½X to near-normal card size.

Combined Procedures

It is this combined use for ordering, brieflisting, and precataloging which provided enough work to justify the camera and processing service. Typically, we discovered the number of new uses we could make of the equipment outran the initial allotment in the first year's budget for such purposes. The answer appeared in the numerous requests from readers for Copyflo prints of journal articles and other printed materials held by the Library. Such a photoduplication service was started, at a price low enough to be agreeable to the majority of users and yet high enough to permit retention of the equipment for its regular labor-saving Library duties.

Xerography

Although enthusiastically received by professors and students, this service suffered to some extent from the necessary delay for processing. Partly for this reason, but mostly to handle our own correspondence and invoice duplication and to experiment with card reproduction, we installed a Xerox 914 Office Copier in July, 1961. The advantages of rapid copying with this machine were soon apparent. Use boomed both inside and outside the Library, so that the total number of exposures made each year has topped 100,000. A price of ten cents was found sufficient, together with the budgeted allotments, to cover the rental and materials for paid and administrative use for both the Xerox 914 and the microfilm/Copyflo service. A recent change in budgetary ground rules has permitted compensation of labor too. A second Xerox 914 installed in the Science Library created new users rather than a reduction in demand for the first machine.

We soon put the Xerox 914 to work in making quick copies of *NUC* entries (a page at a time) for rush cataloging. The entry is cut out from the copy and stapled to a $3'' \times 5''$ slip for annotation by the cataloger. It is then typed on a Multilith offset master. Our former method was to type rush *NUC* entries on the slip and then have it retyped with any changes and additions on the masters. So one typing

and its proofreading have been eliminated by the Xerox 914 reproduction, which actually costs us about 5⅔ cents in rental and materials for the entire *NUC* page, although only one entry is used. The same reduction in typing and revision results from the Copyflo enlargement used for non-rush items, at a lower cost of 3⅔ cents for rental and materials. (See the end of this article for analysis of these costs.)

Combination with Offset Printing.

By 1962 we had worked out a method of using the Xerox 914 to transfer the precataloging Copyflo print, with additions and corrections by the cataloger, to Multilith offset masters. To do this, we used a clip-and-mount technique to reduce the area of background toner from the Copyflo print. Rubber cement is the medium for attaching the copy to a 3″ × 5″ slip, which bears the call number and other added information. The slight border around the printed area is apparent, but various experiments to minimize it are underway by Karl Lo, Cataloger of our Far Eastern Collection and a prime user of Xeroxed masters. The master typists also operate the Xerox 914 and therefore can make the decision whether copy is more quickly typed or prepared for Xeroxing. Most English fiction fits the first category, but foreign language non-fiction is definitely faster and more accurate when prepared by Xerox. Up to 150 Xeroxed masters an hour can be produced by two persons (to prevent the machine stopping between exposures), compared with 25 to 30 masters prepared by one typist.

Four copy slips at a time are arranged in the windows of a bristol-board template. Mr. Lo found that a photoflood lamp in a pyramidal shade, placed above the template on the scanning glass, eliminated any shadow border around the 3″ × 5″ copy slip. The template was designed to place the copy in accurate registration on 8½″ × 12″ Multilith masters, Series 2000, prepared to our design. These masters are pre-perforated to tear apart into four individual masters, each 4¼″ × 6″. They are the thinner type recommended for the Xerox 914, and even with the cost of design and perforation added, they are less expensive than the usual Series 3000 masters sold by Addressograph-Multigraph for library card production. Our average of 8 cards per master is well within the useful life of the Series 2000 type, which can extend to 20 or 30 copies of a form.

When the background toner is excessive, a condition usually avoided by reducing the toner level in the Xerox before card work is done, the fused toner can still be cleaned or unwanted data removed with Skip-Tone Pads, Master Cleaner, or Deletion Fluid. Fine steel wool is another possible abrasive. Surface Conditioner returns the masters to immediate use, and they are then run off singly onto ordinary punched catalog card stock with our Multilith Model 81.

A trial period using these methods convinced the catalogers that they could endure a higher level of grayness than could the experimenter, and in a delightful turnabout on the reaction expected from the catalog-

ers, the K. U. department has voluntarily dispensed with the refinements of cleaning in the interests of greater production. Most of their recent Xeroxed masters have been made directly from catalogers' typed copy whenever suitable. This has boosted such masters to approximately 25 per cent of the total Multilith output.

Particular Constraints

What appears, at first, a round-about way of producing cards was done intentionally. The advantages of this method lie, first, in the ease of using the Xerox 914 for card production without losing any of its capacity for copying correspondence or book pages onto paper of ordinary thickness, and, secondly, of interchanging typed and Xeroxed masters on the Multilith. Thirdly, by maintaining the needed equipment and the services it provides within the Library, unit costs are kept low enough to permit microfilm-Xerox-offset card production when desired. We were cautioned by the Xerox Corporation not to run card stock thicker than .006" through the Copier, although the feed can be adjusted to accept thicker stock if all work will be on cards. But even if we did adjust the feed, the machine would demand that several cards be run together and then be cut into the usual card size. This means batching work according to the sizes of the card sets needed. The best arrangement for us seems to be Xeroxing masters in multiple, but Multilithing each card set separately, using card stock already cut and punched. This permits coordination of such masters with the usual typed variety.

Rather than adopt one rigid system, we have preferred the option of using the advantages of currently-available equipment without sacrificing the older methods which still prove beneficial. In a sense, we are operating several systems in parallel at reasonable cost, observing each, and switching from one to the other as the need arises or conditions change. As other ways open, we intend to explore them with equal willingness to experiment, choosing those elements which best suit our needs.

Unit Costs

An attempt has been made to assess the costs of making copies by the microfilm/Copyflo system, the Xerox 914, or offset printing, singly or in combination. Our experience, we must warn, cannot be transferred without caution, since it is affected by many local conditions that perhaps could not be duplicated. Notably, this includes the large volume of use of the microfilm/Copyflo system and the Xerox 914 over which we can spread the equipment costs. The compensation from paid use of the machines is only a working alternative for the large budget subsidy which otherwise would be required to maintain that volume. Supplies purchased in larger quantities or under state contract also reduce unit costs. Also important is continued use of an older Multilith machine that has long since been amortized and now costs little more

than service and supplies. Labor costs vary so between libraries and geographic areas, that estimates of time required for different operations have been substituted. These can be converted into cents and added to the costs of equipment and supplies.

Because of these variables, the only thing that can be said without a surfeit of qualifications is that the animal may be a horse, but not an elephant. The cost does not exceed that of Library of Congress cards, for instance. It costs slightly less for us, with labor added, than the 16 cents per set reported by UCLA for a somewhat similar operation.[7] The ease of carrying decimals beyond the accuracy of the observations should not blind us to the intuitive truth that the most expensive method of card production possible would still be a small fraction of the cost of cataloging a book.[8] The bulk of the cost remains in the human contribution, and true savings can only be expected by providing convenience to the cataloger in such a way that greater production is facilitated. This has always been the goal of our experiments.

TABLE 1

Microfilm/Copyflo Unit Costs (3" x 5" prints)

Rental per exposure (90,000 exp./yr.)[9]	$.012
Film and processing per exp.	.002
Prints per exp.	.022
Total Equipment and Supplies	$.036
Labor estimate per exposure (including allowance for set-up time)	
BPR copying	.1 min.
Brieflisting	.2 min.
Precataloging	2.5 min.

TABLE 2

Xerox 914 Unit Costs (paper prints)[10,11]

Rental per exposure (100,000 exp./yr.)	$.003
Unit Charge	.035
Supplies per exp. (including drum replacements and paper)	.018
Total Equipment and Supplies	$.056
Labor estimate per exposure (depending on difficulty of work)	.2 to .8 min.

TABLE 3

Xerox-Multilith Unit Costs (8-card sets)

Xerox Equipment and Supplies[12]	$.014
Multilith master (each card = $\frac{1}{4}$ master)	.009
Multilith Service per set (16,000 sets)	.015
Multilith Supplies per set	.016
Catalog cards (8-card set)	.030
Total Equipment and Supplies	$.084

Labor estimate per set	
Xerox (2 persons X previous high est.)	1.6 min.
Multilith (1 person)	1.2 min.
Total Labor	2.8 min.

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10. Compare with other costs (especially p. 192) reported in: Hawken, W. R. *Photocopying from Bound Volumes, a Study of Machines, Methods, and Materials. (LTP Publications,* no. 4) Chicago, ALA Library Technology Project, 1962. 208p.
11. Costs also appear in: Stevens, R. E. "Library Experience with the Xerox 914". *Library Resources and Technical Services,* 6:25-29. Winter, 1962.
12. This cost is calculated as ¼ of the $.056 derived in Table 2, with a negligible allowance for the unused paper.

Regional Groups

DORIS RANSOM, *Chairman*
Council on Regional Groups

REPORTS OF seven regional group meetings were received in time to be included in this resumé.

The resources and Technical Services Section of the Iowa Library Association had a business meeting following the program meeting held jointly with the Resources and Technical Services Sections of the Minnesota and Wisconsin library associations. This program meeting was included in the preceding quarterly report.

At the Nashville Catalogers' business meeting new officers were elected, and the Group decided that there was enough interest to continue its existence.

The processing of phonorecords was the topic of the meeting of the Catalogers' Section of the New Jersey Library Association. Bella Van Dyke (Paterson Public Library) opened the discussion with a review of Mary D. Pearson's recent book on recordings. Howard Vogt (Bloomfield Public Library) and Terry Worth (Newark Public Library) reported on the processing of phonorecords in their libraries.

The New York Technical Services Librarians heard Thomas Minder speak on an analysis of costs in technical services which was made recently at Pennsylvania State University as a preliminary study looking toward automation of acquisition processes. Prior to Mr. Minder's paper, Frances Lubovitz (Yale University) reported on the work of the Filing Code Revision Committee.

The Northern Ohio Technical Services Librarians heard John B. Nicholson (Kent State University) speak on the Ohio College Association's proposed bibliographic center for academic libraries in Ohio. Following the program, new officers were elected and changes in the Group's constitution were approved at a business meeting.

The Ontario Resources and Technical Services Group conducted a one-day workshop; the morning session was devoted to a report by Willard Dennis (Kansas City Public Library) of the organization and work of the Southwest Missouri Library Service; during the discussion period following, centralized cataloging for Ontario was the chief topic under consideration. The afternoon session heard a panel discussion on the University of Chicago Graduate Library School conference on the changing character of the catalog by Grace Pincoe, Betty Williamson, Mildred Linton, Ritvars Bregzis, and Katherine Packer.

John Metcalfe (University of New South Wales, Australia) read a paper entitled "What Has Happened to Mr. Cutter?" at the meeting of the Philadelphia Area Technical Services Librarians.

Equipment and Methods in Catalog Card Reproduction*

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THE REPRODUCTION of catalog cards is one of the more complex and less standardized areas of library technology. The factors that complicate the process are the following:

(a) The information on catalog cards is expensive to assemble.
(b) This information is essential and should be reproduced on all cards.
(c) Catalog cards are produced in large quantities (i.e. from 1,000 to 500,000 cards a year).
(d) Cards must be durable: Materials must be tough and the ink permanent.
(e) Little variation in card size can be tolerated.
(f) Except for two cards in a set, all cards have the information arranged differently, and in most cases, must be handled individually.
(g) Cards should be added to the catalog immediately. Delay usually involves the insertion of temporary (and expensive) records.
(h) Cards must be reproduced in all languages and all alphabets.

Since no two libraries' card needs are the same, no single reproduction process, method, or piece of equipment can meet the needs of all libraries.

In general, however, a small library should buy a post card size stencil duplicator; a medium size library should invest in a full size stencil duplicator; and a large library should use an offset machine with additional camera equipment to make masters, if needed.

Printed Cards

Libraries have two choices: they can either buy printed cards or reproduce their own. Printed cards may be received with headings and call numbers printed on them from the H. W. Wilson Company or

* Revision of a paper read at the Equipment Institute held at the University of Miami, Coral Gables, Fla., June 14-16, 1962; co-sponsored by ALA-LAD's Building and Equipment Section and the Library Technology Project; and appearing in *Library Furniture and Equipment,* published by the American Library Association, 1963. It is published here by permission. The information is based on the LTP's study on catalog card reproduction carried out by the management consultant firm of George Fry Associates, Inc. Mr. Treyz served as Library Consultant throughout the study.

through a cataloging service like Alanar. More often, they are purchased from the H. W. Wilson Company or the Library of Congress in sets of unit cards, with the library adding the call numbers and headings.

The overriding consideration in purchasing printed cards is the fact that the library is purchasing cataloging information and, in the process, receives the necessary catalog cards. Only when another means of obtaining Library of Congress cataloging information is available (for example, LC proofsheets, the printed *National Union Catalog* or *American Book Publishing Record*), is it possible for a library to consider reproducing its own cards. This is practical for medium size and large libraries. It is too expensive for a small library to subscribe to proofsheets or to search for the entry in *American Book Publishing Record* and then proceed to reproduce a set or sets of cards.

Ready-made cards, such as Wilson printed cards, are the most economical for small libraries whose catalogs have been built up from completed cards. Libraries, however, which have not used the completed cards may find that the changes necessary to fit them into their catalogs are more expensive than typing their own call numbers and headings on LC or Wilson unit cards.

Typewriters

All libraries must type some cards. This is true for the large library with elaborate card reproduction processes and the small library as well. If only two or three cards are needed, they should be typed. The point where one should begin reproducing cards is elusive and variable. It depends primarily upon the length of cataloging copy and the number of cards needed per set. A set with considerable information on the catalog card, that is, seven or eight lines should be reproduced when four or more cards are needed. Cards with a small amount of information should be reproduced when six or more cards are needed. University libraries usually duplicate their cards at four or five; public libraries at six or seven.

The differences among the better known manufacturers' models of typewriters are usually insignificant. The choice is a matter of operator preference or taste and might be compared with the choice between a Ford, a Chevrolet, and a Plymouth. The machines should be tested for card work before they are purchased. Some standard models may need card platens, so that the top and bottom lines can be clearly and neatly typed. Cataloging requires special keys, for example brackets, a script *'l,'* accents, etc. If a library processes large numbers of foreign titles, other special keys are desirable.

An electric typewriter should be purchased if the machine will be used extensively. Although costing about two hundred dollars more than a standard model, it is 20 per cent faster with straight typing and 15 per cent faster with card work. The copy is also clearer. Electric typewriters are especially useful for typing stencils or masters. They strike with a uniform pressure and produce sharper lines.

With proportional spacing electric typewriters, it is possible to place 10 per cent more information on a catalog card. This same feature, however, makes it difficult to correct errors and more than offsets the advantages of these machines. Since they cost 50 per cent more than standard electrics, they are not recommended for card work.

Small type face, such as IBM text type, is available on most typewriters. This allows for the insertion of 35 to 55 per cent more material on a card than is possible with the use of elite type, and 40 to 65 per cent more material than pica type. Some libraries whose detailed cataloging information occasionally requires a second card are using this size type. Once these cards are in the catalog, they are more difficult to read. As a full catalog of these cards would be a difficult tool to use, this small type is not recommended for catalog cards.

A Vari-typer is a versatile machine that has capacity for two sizes of type or a double alphabet: One can, for example, put Russian or Greek characters on these machines. Vari-typers cost about one thousand dollars and are slower than standard typewriters.

The new IBM Selectric typewriter should meet all of the various typing needs of a library when library-keyed balls are available. These balls are easy to put on the typewriter and should provide not only different sizes and kinds of type but as many non-Roman alphabets as needed. Positioning of the typing ball at a preselected location on a card, however, is much slower than with a standard IBM typewriter.

Most libraries which type all their cards waste time and money. The typing of cards is expensive, as is the proofreading of every card. When a library types four thousand individual cards a year (approximately one thousand titles), it is close to the point where it will pay to invest in a duplicator as a means of reproducing cards.

Stencil Duplicators—Post Card Size

Small stencil duplicators look very much like toys and, in most cases, were designed for the inexpensive reproduction of post-card notices. Fortunately, the catalog card is a similar size, and many of these machines have been advantageously used for catalog card reproduction. They all work on the same principle. A single card stencil is perforated with a standard typewriter. Stencils are placed on the machine and as pressure is applied, either by pressing down or turning a drum, ink is forced onto the card stock through the perforations.

The Print-O-Matic is one of these machines. It is about as big as a breadbox and sells for approximately twenty dollars. A central drum contains ink that feeds the ink pad around it. On some of these machines the ink does not distribute itself well, and it is often necessary to brush the ink over the pad each time a stencil is run. Even then, the ink may not come through the stencil evenly, and a number of waste cards must be run off first. It is also difficult to adjust the stencil on the machine to get exact registration. As might be expected, this can be a fairly messy operation. It does, however, save money.

The Card-Master machine costs about forty-five dollars. The stencil is typed in the same way but, in this case, fits on a roller-applicator that looks like a desk blotter with a curved surface. The ink is poured down the handle and dampens a pad over the roller, or it may be brushed on the outside of the pad. After the stencil is placed on the machine, it can be rolled across paper towels or similar material until a good image is formed. This eliminates wasting card stock.

Another important machine in this field is the Chiang Catalog Card Duplicator. It costs about fifty-four dollars and is approximately the same size as the others. This is one of the few machines designed specifically for reproducing library cards. The first model was not very successful. Reports indicate that the later models eliminated many of the troubles of the earlier one. In the latest model, cards are manually inserted into a small box. Ink is poured into the top, and the card is produced by a push-and-pull method. The first few cards may be wasted.

When more than six sets of cards are needed for one title on any of these machines, it pays to type the longest entry at the top of the stencil. Added entry cards are produced first; the heading is then blocked off with scotch tape and the necessary unit cards run off.

All of these small machines have two major drawbacks: First, they are slow; the cards must be hand-fed into the machines and often individually removed. Second, the ink dries slowly. Cards often need to be laid aside individually and allowed to dry, or blotting paper must be inserted between each card as it comes off the machine. Cards that are laid aside may take a day or two to dry in humid weather. Some libraries expedite this by inserting the cards between newspapers or the pages of an old telephone book. Improved, fast-drying inks are on the market and are usually interchangeable in these machines. Librarians should try several to find the one that works best in their machine. It is also important to experiment with stencils. These also differ in quality, some being more satisfactory than others.

The advantages of these small duplicators are those of any automatic process. They are faster and less expensive than typing and proofreading each card. In addition, the investment is small.

When these small machines cannot handle the library's volume of card reproduction, it is time to switch to a full size stencil duplicator.

Stencil Duplicators—Full Size

Prices for this equipment range from two hundred to eight hundred dollars. Some manufacturers are the A. B. Dick Company, The Gestetner Corporation, and the Rex Rotary Company. These machines operate under the same principles as the smaller stencil machines but are better built and faster. They offer the choices of creating stencils by typing or electronic scanning, the use of fluid or paste inks, and a manual or electric operation.

The electronic scanning device is a recent development. It is about as large as an electric typewriter, with a number of dials and two

cylinders. Around one cylinder is placed the information to be copied. Around the other is placed a stencil. As an electronic eye scans the former, corresponding holes are burned into the stencil, thus producing a photographic image of the card copy. The process is slow. It takes seven minutes to scan a 10 inch area. Although it is possible to get six catalog cards in this area, it is only slightly more rapid than typing six cards onto a stencil. The image is somewhat fuzzy, and the machine is quite expensive—about two thousand dollars. If a machine were available for use by a library, it should be considered; but it should not be considered for special rental or purchase.

It is still best to type a stencil. Stencils are available for typing singly or in strips of two or four. Some have guide lines marked on them for catalog typing and contain carbon-impregnated buffers and backing sheets for easy proofreading. Fast-drying correction fluid permits rapid, easy corrections.

The machines that use a paste ink are slightly less expensive and are simpler to use. However, paste ink dries slowly on cards. Some large machines have inter-leaving attachments. This gadget automatically drops a blotting card between each catalog card as it comes out of the duplicator. When several sets of cards have been run off, they are removed from the inter-leaving attachment. They are quite satisfactory, but they do slow down card production. Another disadvantage is that paste ink machines may produce waste cards each time a stencil is run off.

Fluid ink machines are better for longer runs and higher speeds. They require more care, but they produce fewer waste cards. Fast-drying inks eliminate blotting and inter-leaving. One can do sheet work on these machines, but for best results, one machine should be used exclusively for card work. The 3 by 5 inch area the card stencil uses is often saturated with ink, while the rest of the drum is not, which makes it difficult to do good sheet work.

To control the ink on these drums, it is often necessary to place a mask over the ink pad, with the 3 by 5 area cut out. This mask usually is good for only one day's production.

One company, the Fichimprim Company of Comte de Brome, Quebec, has adapted a standard stencil machine, the Rex Rotary M4 Duplicator, for card reproduction. The silk screen of the duplicator is permanently masked so that ink flows only through the area under the card stencil. The pressure rolls have been modified so that they are effective only on an area 4½ inches wide, and a special clamp has been added that permits the rapid placement and removal of the stencil.

When more than 15,000 stencils (ca. 85,000 cards) are used in a year, it is very likely more economical to use an offset machine. These figures are, of course, approximations. A library's decision to change will depend upon the average length of its cataloging copy, the average number of cards in its sets, the average number of sets per title, the cost of the equipment, and the average hourly wage.

Offset Presses

Offset duplication, or multilithing, is most satisfactory for large libraries. Prices of these machines range from $1,300 to $5,000. These machines are successfully used for other printing work besides running card stock, which is usually necessary to justify the expense of the machine's purchase.

Offset machines are larger and faster than stencil machines. Small models are a little bigger than a card table. The larger models, which are the size of a telephone booth placed on its side, allow several sets of cards to be produced at once. Many libraries run off sets of four, six or eight. Pre-drilled card stock is available, or holes may be drilled after the card stock has been cut to size.

The basic principle of offset printing is that oil and water do not mix. After the master is created, the multilithing starts by coating the master with a watery solution. Once the master has been placed on the machine and the machine started, only the carbon-impregnated typed letters attract the oil-based ink. This ink is transferred to a roller or blanket that, in turn, transfers it to card stock as the card stock comes in contact with this roller. After each master has been run, the roller must be wiped clean before another master can be run.

A particularly important consideration in purchasing an offset machine is the availability of service furnished by the equipment supplier These machines are delicate and complicated and often need considerable adjustment and attention.

When more than eight sets of one title are being multilithed, it will pay to use a heading overlay master for each added entry after the main entry and shelf cards are run off. A small strip of a master, with an added entry typed on it, is placed over the original master in the same position as an added entry would be, and the complete added entry card is run off. This method will produce a line across the cards at the edge of the overlay, but this can be prevented with the use of a specially grooved roller. The groove is directly beneath the line of the overlay, thus this line is not printed. Some librarians find it is more satisfactory to re-run the unit cards with a new master typed with only the added entries.

Another method is to use a cut-out roller to delete an added entry in multiliths that have two rollers. In this case, the master has the longest added entry already typed on it. The added entry cards are reproduced with the complete roller, and the necessary unit cards are then produced with the cut-out roller that deletes the added entry.

This method is economical for about five sets of cards per title. It is not as practical as using overlay headings, for only one added entry can be produced this way; all others must be typed individually.

An advantage of offset reproduction is the number of ways it is possible to create a master. Masters can be typed with a standard office typewriter, using a multilith ribbon; with electric typewriters a car-

bon ribbon gives the best results. If Library of Congress proof cards are available and a library has a high percentage of foreign titles, one of the several available photographic methods of making masters should be considered.

Xerox

The standard Xerox machine consists of a camera, a processer, and a fuser. All are rented as a unit. The camera images the material to be reproduced, the processer does the Xeroxing, and the fuser makes the image permanent.

One advantage of Xerography over typing comes from the ability to reproduce a photographic image. Through the camera, it is possible to increase or reduce the size of the image. In addition, the machine is easy to operate. No special skill or knowledge is required, and it is a completely dry process.

An important advantage of a master made on the standard Xerox apparatus is that the copy can be changed. If necessary, editions or call number can be easily wiped off, the master fused, then inserted into a typewriter, and a new edition or call number typed on. None of this is possible with masters made on the Xerox 914.

Xerox has disadvantages. Unless a room is dehumidified or air conditioned, the machine will not perform satisfactorily on humid days. Cleaning the master is a delicate, time-consuming process, although the use of an eraser board can reduce the cleaning time as much as 50 per cent. The selenium plates are expensive and easily damaged, and with continuous use they lose their strength.

It is possible to Xerox four, six, or eight titles at once. With eight, however, the image must be reduced at least 8 per cent to get all of the cataloging information onto the Xerox plate. All cards are placed with the call numbers on the inside so that the four on the right are right side up, while the four on the left are upside down. Since reduction draws the image in, this places the wider margin always on the right-hand side of the reproduced cards. Model B, an early model, rents for approximately fifty dollars a month. Model D, the latest model, rents for about one hundred dollars a month. These machines can process up to 35,000 titles a year. When card reproduction surpasses this figure, a library should switch to Ektalith to create its masters.

Ektalith

Ektalith is a dye transfer, projection-photocopying process developed by Eastman Kodak. The Ektalith machine consists of a camera, a loader-processer, and a transfer unit. The whole system sells for $1,700 or rents for $104 a month. Cameras are available with a vertical or a horizontal exposure tray to suit a library's convenience. The catalog cards to be copied are placed in these trays. Exact registration is important at this stage. It may be necessary to use a T-square to align the four or more catalog cards to be copied.

After exposure, the negative is developed in a small box that is, in effect, its own darkroom, so the process is actually simple and dry as far as the operator is concerned. The negative is a gelatin dye emulsion paper. A paper master is placed in contact with it in the box and the dye is transferred to the master, thus producing the image. Upon removal from the box, the negative and master are separated and allowed to dry. As in the Xerox process, the master picks up shadows and must be cleaned to get a good copy. This is done with a gum eraser after the master has dried. It is possible to increase the exposure to burn out some of the shadows or reduce the copy 5 per cent. This eliminates most of the lines that form around the edges of the card.

Ektalith is faster than Xerox, produces at least as sharp copy, and is not affected by humidity.

Other Machines That Create Masters

Libraries, producing more than 35,000 titles per year, should also investigate two important recent developments: the Addressograph-Multigraph Photo-Direct system and the Itek Platemaster manufactured by the Photostat Corporation.

Offset masters can be produced by Verifax, another Eastman Kodak Process. This dye transfer method uses contact photocopying, rather than projection photocopying as does Ektalith. The contact method does not produce as sharp a copy, and registration is a problem. Few, if any, libraries are using Verifax for the reproduction of card masters.

Another method of producing offset masters is with the electronic scanning machine mentioned earlier in connection with the making of stencils. The copy is made in the same manner; that is, scanned electrically, but a special electro-sensitive offset master is used in the place of a stencil.

The same difficulties are present in this process. The machine is expensive; the reproduction is of poor quality; and the process is slow, plus the limitation that these offset masters must be used within eight hours. It is not recommended for this type of library use.

Two other methods are available but are not recommended for the reproduction of masters. One is direct photographic transfer and the other, the use of a Thermofax machine. The former is too expensive, and the latter gives a poor quality reproduction.

Other Card Reproduction Machines

A number of other means of reproducing cards are used in libraries. Many are too costly or produce inferior results.

The least expensive of these processes is fluid duplication. A. B. Dick, Ditto, and Standard Duplicating Machines Corporation make these machines that sell for from $80 to $850.

In the fluid duplication process the cataloging information is typed on a Hectograph carbon paper master. The master is cut to card size and placed on the machine that works like a stencil duplicator. Alcohol

activates an aniline dye that is transferred from the master to the card stock as it is fed through the machine. The aniline dye creates the familiar purple image that is, unfortunately, not permanent. For this reason, it is an unacceptable process for reproducing cards for most libraries.

This disadvantage may be eliminated by a "perma-copy" fluid recently developed by Ditto. If successful, fluid duplication may be satisfactory for many school or public libraries. However, pending substantial proofs of permanency, fluid duplication should not be considered for card reproduction.

Some libraries use addressing machines. There are two types: those using fiber stencils and those using metal plates.

The Elliot Company makes the fiber stencil equipment. The stencils come mounted in cardboard frames. These must be thoroughly soaked in water before they can be typed and, thus, are first placed in a moistener. They are then typed with a standard office typewriter. The stencils are placed in an addressing machine where a printing pad contacts the stencil, forcing ink through the perforations onto card stock.

These addressing machines are expensive, costing about $1,500. They are not recommended for card work because the size of the stencil restricts the amount of cataloging information to nine shortened lines.

The addressing machines that use metal plates as masters are even more expensive, about $1,800, and they require a $2,000 Graphotype to stamp out the metal plates. The Addressograph-Multigraph Corporation makes this equipment.

This process starts by embossing the metal plates with the catalog information. The plates are then inserted into metal frames and the frames placed in the magazine of an addressing machine. The machine automatically brings the plates to printing position. The platen, mounted on the operating arm of the machine, is brought down against the card stock, and the copy is reproduced through an inked ribbon.

Since this method can produce only nine lines of copy, it has no advantage over fiber stencils and is more expensive. Both methods are unsuitable for catalog card reproduction in an average library.

Automatic typewriters are used for catalog card reproduction. The Friden Company produces the FlexoWriter. Remington-Rand and Royal McBee have similar machines. Prices range from $2,000 to $3,500. This process cuts coded perforations on paper tape as the catalog copy is typed. After removal, the ends of the tape are joined and the tape loop is placed in a tape reader. The reader operates the typewriter automatically by electrical impulse. As a set of cards is typed by the tape, card stock can be fed individually, or a continuous form card stock can be used. The latter is perforated by a 3 by 5 inch size and is torn or burst apart later. The continuous card stock allows the operator to be free for other duties, such as typing headings on the cards. These cards, however, produce a catalog with rough top edges that wear poorly and are easily soiled.

An automatic typewriter cannot produce unit cards much faster than a good typist. The saving results only when the operator is freed for other duties; and after the original card is proofread, no further proofreading is necessary. Nonetheless, this method is very slow compared to stencil or offset duplication.

It is also expensive, using delicate machines that are easily thrown out of operation. Errors must be caught at the time they are made or a new tape must be cut. Correcting errors is more time-consuming than correcting errors in most other processes. Additional errors can be avoided, however, since all, except the portion to be corrected, will be produced automatically. These machines are noisy. It is questionable whether they should be in a room where cataloging is done.

Tape typewriters may be practical in card reproduction if the typewriters are used elsewhere in the library's operation; otherwise, their slowness, noise, and expense make them most impractical for card reproduction.

Cards can be reproduced directly by electrostatics. This is possible with standard Xerox equipment, the Xerox 914 Model, the Xerox Copyflo, and some of the new machines employing the competitive Electrofax process. The latter may make the real breakthrough in card reproduction and, perhaps, in all kinds of copy reproduction. These electrostatic machines work on the same principle as Xerox. The working substance in this case is an inexpensive compound, zinc oxide, which is coated on masters or card stock and becomes light-sensitive when charged. The paper is charged, exposed to the cataloger's copy, dusted with resinous powder, and then fused. This eliminates the need for the expensive and delicate selenium plate or drum of the Xerox process.

The first machines being marketed are roller machines and not particularly adaptable to card reproduction. Registration and image quality are poor when the cataloger's copy must flow around a series of rollers. Only machines with flat exposure beds should be considered for card work. These machines are also currently priced just below their Xerox competitors. As more models come out, they will compete and their price should fall.

Some commercial companies have gone into the reproduction of cards with the Copyflo machine. This machine rents for more than most individual libraries can afford. So far, it has provided the least expensive way of reproducing an entire catalog.

With Xerox Copyflo, the cataloger's copy is microfilmed, one exposure being made for each card needed in a set. The microfilm is enlarged onto continuous card stock, which is later cut to size and punched. The quality of the results is dependent upon the machine operator's skill, careful maintenance of the printer, and the quality of the original cards. Unless a library requires more than half a million cards annually, the work must be contracted to an outside operator; this may mean some delay. Outside sources are often insensitive to and uncomprehending of a library's requirements, hence the library contemplating

contractual arrangements must make very clear at the outset its quality and delivery requirements, otherwise the results will be less than satisfactory. Depending upon volume, the cost ranges from 3½ cents to 7 cents per card. If a library requires more than half a million cards annually, there may be some advantage to installing a Copyflo machine within the library.

The Xerox 914 is a smaller machine designed for office work. Most larger libraries have rented this machine for general copying, and many have tried to adapt it for card reproduction. A few are using it to reproduce masters, and a number of libraries are using it to reproduce cards directly.

The Xerox 914 is not easily adapted to either type of reproduction. Those producing masters are able to get four titles on a strip. Exact reproduction is assured by putting the cataloger's copy in a jig. There is no trouble in producing a master; the problem comes in trying to clean the end product. This has the familiar unwanted blotches and lines that have been fused into the master while it was in the machine. Directly produced cards are similarly untidy. The Xerox 914 was not designed to handle the heavy card stock. Card stock has stuck in machines and burned. Xerox is recommended only for the production of masters, with its standard Model B or Model D equipment.

A few libraries use diffusion transfer methods with such machines as the Dri-Stat and the Copease Corporation Book Copier. Some have used the Diazo process and a direct photographic process such as the Photostat. But such uses are rare and generally impractical.

Conclusion

The future for card reproduction is bright. The development of the new electrostatic machines promises dramatically reduced costs to large libraries. For small and medium size libraries, the Council on Library Resources is developing a new, card size, multiple stencil duplicating machine. The unique feature of this machine is its ability to reproduce, from a single stencil, sets of completed cards with as many as five different headings within a set. This feature will be especially important to libraries requiring several sets of cards for each title and will make the stencil duplicating process even more attractive in comparison with other processes.

The most exciting development in catalog card technique today is the Library of Congress Cards with Books Program. This program makes it possible for libraries to receive LC cards with the books when they come from participating book dealers or publishers.

Cards with Books is not a substitute for Cataloging in Source; it lacks the scope, bibliographical advantages, and universal potential of Cataloging in Source. None the less, the program helps perfect the existing system since it offers faster cataloging at reduced costs. Its economies result from the ability of the Library of Congress to send out multiple sets of LC cards for a fraction of the total cost of sending

them individually to libraries. Book dealers and publishers will order sets of cards for each title that they stock in quantities of twenty-five or more. The packages of cards will be stored alongside these books and when a library orders a copy, a set of LC cards is placed in the book and shipped to the library. The sets are standard 3 SAT, which gives each library three author cards and one card for each subject, added entry and title traced. They are prepared and packed at the Library of Congress. The dealer's only job in the process is to buy them and pass them on.

For libraries, the saving is substantial. It eliminates searching and recording the Library of Congress card number, sending out orders, filing a copy of the order, waiting for cards, uniting the cards with the books when they arrive, and paying the Library of Congress. Furthermore, the actual cost of the cards would be less. How much less depends upon the book dealer. The pattern of pricing varies from free cards to a charge of 25 cents a set.

Few dealers now participate in the program. The others wish to avoid the extra work and expense. It appears, however, that all it will take is a demand from librarians to get a majority of dealers into this program.

The importance of Cards with Books to libraries cannot be overemphasized. Once in effect, it will solve all card reproduction problems for school libraries and for small and medium size public libraries. For all other libraries, no matter how large or specialized, it will mean substantial savings and faster processing.

It is quite common to hear talk today of accepting Library of Congress cards as they stand. Librarians should be warned against this dangerous practice. Continued blind acceptance of printed cards assures the destruction of a catalog. The catalog is a tool that must change with every change in modern society. New subjects are created daily, and old ones are called by new names. Both Library of Congress and Dewey classifications change to keep pace with developments and expanding fields. The catalog must record and absorb these changes. If it does not, it will be an inconsistent, undependable, and inaccurate tool. Every printed card that goes into a catalog must be checked for main entry, added entry, subject headings, and classification.

Library Card Reproduction by Xerox Copyflo

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THE FACTORS GOVERNING the choice of a card reproduction system have been described many times in the literature and can be summarized briefly as follows: the quality requirements, the number of copies needed, delivery time, the available means of presenting both Roman and non-Roman alphanumeric information, the percentage of Library of Congress cards applicable to the library's collection, and, finally, local cataloging policies insofar as they affect creation of the original card, the card format, and the insertion of variable data on the cards.[1]

The Preliminary Card System Combined with Offset Printing

Over a period of years Harvard has developed an informal system of cataloging based on "preliminary cards" prepared by typists working from books and searching reports. These preliminary cards are edited by professional catalogers and retyped as necessary. Where little or no editing is required, the preliminary card is designated as the main card for the Official Catalog, and the balance of the set is typed. The possibility of mechanical reproduction of cards was always kept in mind, but the number of cards required for each title had not been considered sufficient to justify the equipment. During the middle 1950's, the need for increased production, combined with the difficulty of recruiting typists, made it urgent for the Library to abandon the typing of each card in a set.

In choosing a reproduction method, a primary objective was to preserve the preliminary card system, since it involved no worksheets and kept typewriters out of the cataloging room. A secondary objective was to make the system available to all units of the University Library, regardless of their separate cataloging policies and differing card formats. Offset printing from separate masters onto individual, pre-cut cards was finally selected. Besides fulfilling the above major objectives, this choice offered several other important advantages to Harvard: it eliminated the collating step associated with reproducing several cards at a time on a larger master; it required no cutting or punching equip-

ment; and, finally, it permitted retaining the maximum of bibliographic detail on the official card, while limiting the information given on secondary cards, since the typist prepared an offset master from an edited original. A disadvantage was that Library of Congress cards could not be reproduced without typing a master.

In its early stages, the offset method functioned quite well; but as work from departmental libraries increased in volume, the system inevitably began to fall behind owing to the fixed capacity of the offset press when working with a single 4″ × 6″ master.

Change to Xerox Copyflo Printing

Just as this was happening, a visit to the Library of Congress Photoduplication Service drew the Library's attention to the Copyflo method. Besides offering speedy delivery, good quality, and an enormous capacity for expansion of the work load, the Copyflo system featured two unique advantages: it could produce exactly as many cards as were required and it could print on demand a single copy of any card file.[2] In the course of studying the Copyflo method, we also visited three commercial firms carrying out card reproduction work, but found the Library of Congress method to be the most highly automated and consequently the most efficient.[3] Although this system had been reported in the *Annual Report of the Librarian of Congress* and had been described in several journal articles, it appeared to have received little attention from librarians.[4-7] In January 1961 the Library Technology Project issued a brief statement on the Copyflo method, but this was only in reference to commercial Copyflo operators, many of whom are now actively soliciting the library card reproduction market.[8]

The minimum annual production required to support a rented Copyflo machine was figured at about 500,000 cards, and since production at Harvard approached a million cards annually, the method did seem practicable. After further discussions with the Library of Congress Photoduplication Service and submission of a detailed proposal to the Xerox Corporation, it was decided to adopt the Copyflo method in place of offset. As the Library was already purchasing Copyflo service from a commercial contractor, it also became apparent that the combination of card reproduction and Copyflo printing might result in savings over existing costs. Accordingly, arrangements were made through the Chief of the Photoduplication Service at the Library of Congress, for the laboratory supervisor at Harvard to familiarize himself with the operation of the Copyflo printer. The machine itself was installed at Harvard in April, 1963. After several months' experience with regular Copyflo work, pilot production of cards was begun in the summer, and by September the photoduplication laboratory was in full card production. The normal work schedule provides for daily operation and the completion of all incoming card work within 72 hours. We have found that one person doing all phases of the job can produce up to six thousand finished cards in a seven-hour day.

Basic Steps in Copyflo Card Reproduction

The basic steps in the production of Copyflo cards are: (1) pre-sort the original workcards according to the number of finished cards required, (2) microfilm the cards, (3) process the film, (4) print the cards onto a roll of card stock, (5) cut the cards to size, and (6) punch the holes. The purpose of pre-sorting is to enable the camera operator to take pictures as fast as possible; the operator takes as many exposures as cards are required. The pre-sorting is done by the libraries which use the service. The microfilming is done on a jig designed to assure precise registration of each card; this jig is underlighted to eliminate shadows around the edges of the cards and at the hole. After processing, the film is enlarged onto continuous card stock with the Copyflo printer. Cards are separated from the roll of stock with an Alves automatic cutter. Following this rough cutting, the cards are precision cut on a power cutter and then drilled. A complete technical explanation of the process may be found in the author's article "High Speed Reproduction of Library Cards," to be published in the *Proceedings* of the National Microfilm Association for 1964.

The approximate time required for handling a daily work load of six thousand cards is as follows: Microfilming, about two hours; processing, one hour; printing, one hour; cutting and drilling, one hour. These figures are conservative and include setup time for each machine. The remaining two hours in the day are devoted to other Copyflo work and to maintenance of the various machines. Since the beginning of full-scale production in September, 1963, the Copyflo system has been able to maintain without interruption the announced 72 hour service, despite daily variations in the work load; and recently, owing to a special rush project, the system experienced a 30% overload with no delays in delivery time. No upper or lower limits are imposed on unit libraries regarding the number of cards which may be requested.

Advantages and Disadvantages

No system is perfect. The system selected for use at Harvard features some advantages and some disadvantages; it is a matter of weighing the one against the other, and maintaining the awareness that some disadvantages arise regardless of the system chosen. Perhaps the principal advantage to Harvard of the Copyflo system is that it enabled an inherently inefficient unit production process to be batched into a fast, smooth-flowing continuous process.[9] Among the other advantages of Copyflo card reproduction are the following:

1. A single copy of any card file can be created at a reasonable price.
2. Any characters—Japanese, Hebrew, Arabic, etc.,—may be reproduced, and no retyping is required if existing copy is available in the form of Library of Congress cards or proof sheets.
3. Very few unwanted cards are reproduced.
4. Service is rapid.

5. Cost of the service is substantially less than the same service purchased from commercial sources.
6. The system has enormous reserve capacity.
7. The number of different machines and processes in use for card reproduction within the University has been minimized.
8. The University Library was enabled to install a Copyflo printer and obtain the benefit of its use for purposes other than card reproduction.

Among the disadvantages can be listed the following:

1. Individual libraries must spend time pre-sorting cards in preparation for microfilming.
2. A certain amount of collating may always be necessary to bring together the original card and the copies.
3. Secondary headings must still be typed manually.
4. Variable data are not readily masked or removed.
5. From time to time there are variations in the print density.
6. Considerable preventive maintenance is required to avoid objectionable xerographic "background" appearing on the finished cards.
7. As an internal operation, Copyflo is probably limited to those libraries requiring 500,000 or more cards per year.

It is apparent from the above that the Xerox Copyflo method of card reproduction—like any other method—cannot be endorsed or recommended out of context. *The decision to use a given method must flow from the institution's needs and not merely from the merits of the process itself.* No library should undertake the Copyflo method unless there is certainty that the method matches the need.

Only one other method was considered—offset printing from photographically generated masters containing at least eight card images. This method is recommended by the Library Technology Project for libraries cataloging 15,000 or more titles each year.[1] While offset printing is without doubt a highly satisfactory method in certain applications, it was turned down at Harvard for the following reasons: Waste was too great—50% to 100% in the numerous instances where only four or five copies of the card were needed; there was no economical way of creating larger editions of cards without cumulating (and hence delaying) cards from several libraries and possibly getting cards from various libraries mixed up; editions of one, two or three could not be produced; the press would have had no other uses in the library; and, most photographic masters had to be printed immediately or could not be readily stored. Finally, the offset method would have made it necessary to continue purchasing regular Copyflo service at greater cost from an outside contractor.

Costs

A cost/volume study in the area of document reproduction usually produces a rule of thumb relating the process, the volume of work, and the size of the editions. In the present case the justification for not following the rule of thumb was a basic decision to concentrate on using the fewest possible processes to produce the widest variety of results. Thus, one combination of machines is used for library cards, paper prints, and offset masters. This decision permitted the elimination of some equipment, service contracts, and supplies, and reduced the need for trained personnel.

Machine rental is currently $800 per month. Basic rental provides up to 1,000 minutes of operation, or 20,000 feet of finished copy at the rate of 20 feet per minute. A monthly production of 100,000 cards accounts for nearly ninety percent of the minimum monthly commitment, and provides a unit cost of about $.02 per card, counting Copyflo time, supplies, and depreciation of auxiliary equipment, but not including labor, overhead, utilities, and equipment installation costs. For 50,000 cards per month, the unit cost would be about $.03 per card.

On the few occasions where many copies of a card are required, the Xerox Copyflo system is apparently used uneconomically; the incidence of such use at Harvard is, however, so small that it is insignificant in comparison with the savings on overhead, depreciation and other costs associated with the maintenance of an additional process. If, for instance, thirty or forty cards are needed, it is simply cheaper to go ahead and make them with the established system than to spend time searching for an offset printer to do the job.

Beyond the minimum rental there is an overcharge at the rate of $.24 per minute of running time. If the machine can be used for any other purpose, such as reprinting books and articles or creating offset masters, the unit costs will fall as machine time rises. The decline of cost with increased Copyflo volume is much more rapid than for the Xerox 914, hence real advantages accrue if there is any reasonable prospect for total volume exceeding the minimum.

The rapid progress of technology in the generation and copying of documents is demonstrating several important effects on the Library's equipment budget and its capacity to serve its clientele. It is no longer necessary to justify costly equipment on the basis of a long period of amortization, say ten or twenty years. The rapid growth of leasing and lease/purchase plans now permits libraries to take advantage of up-to-date equipment without tying up capital funds. What is perhaps more important, when a process becomes superseded, one need no longer carry on with the obsolete process. The lifetime of the present system of card reproduction is anticipated to be three to five years. The next advance in the production and use of catalogs,

book, card, or other format, is expected to stem from the progressive installation of computers in libraries.[10-12]

REFERENCES

1. Library Technology Project. *Catalog Card Reproduction Study: A Summary*. Chicago, 1963. 7p. Mimeographed. In 1961 The Library Technology Project commissioned George Fry & Associates, Inc., to conduct a full-scale investigation into the matter of catalog card reproduction. As of this date the full report has not yet been published, but a number of the more important criteria for process selection may be found in this brief summary and in Mr. Treyz's article elsewhere in this magazine.
2. The Library Technology Project's summary report mentioned that Copyflo reproduction of cards "is subject to delays and the cards are often of poor quality." However, the quality of card reproduction achieved by the Library of Congress Photoduplication Service left little to be desired. It was also felt that delays could be eliminated if, with its own equipment, the Library was not dependent upon outsiders who might have other more attractive commitments.
3. The problem of card reproduction attracted the attention of the Library of Congress Photoduplication Service from its beginnings. The Service's first report issued in the 1938 *Annual Report of the Librarian of Congress*, p. 312, voiced the hope "that a satisfactory automatic library card reproducing unit will be designed and built during the year."
4. *Annual Report of the Librarian of Congress*. Report for 1959, p. 70; for 1960, p. 15 and 57.
5. LaHood, Charles G. "Microfilm as Used in Reproduction and Transmission Systems," *Library Trends*, 8:455. January, 1960.
6. LaHood, Charles G. "Production and Uses of Microfilm in the Library of Congress Photoduplication Service." *Special Libraries*, 15:68-71. February 1960. See especially p. 70-71.
7. Holmes, Donald C. "Electrostatic Photoreproduction at the U.S. Library of Congress." *UNESCO Bulletin for Libraries*, 15:18-20, 24. See especially p. 20 and 24, "Reproduction of Catalogue Cards."
8. Library Technology Project. "Some Comments on Reproducing Card Files by Microfilm and Copyflo." Chicago, January 1961. 1 p. Processed.
9. In computer usage, the more work which can be batched for machine handling in a single pass, the more efficient the process will be. The most inefficient operation possible is the batch of one, where each step of the operation is carried out individually in fixed sequence without cumulation or batching of like steps; for card reproduction the analogue is typing individual cards one after another. For this comparison I am indebted to R. L. Patrick, author of "So You Want to Go On-Line", in *Datamation*, 9:25-27. October 1963.
10. Lipetz, Ben-Ami. "Labor Cost, Conversion Costs, and Compatibility in Document Control Systems." *American Documentation*, 14:117-122. April 1963.
11. Fasana, Paul J. "Automating Cataloging Functions in Conventional Libraries." *Library Resources & Technical Services*, 7:350-365. Fall 1963.
12. A collaborative project is currently underway by the medical libraries of Columbia, Harvard, and Yale to enter first onto punched cards and then into a computer currently cataloged monographs having 1960 and later imprints. A major purpose of the project is to experiment with mechanized retrieval of catalogue card information concurrently with the usual usage of the card catalog to see which type of retrieval system works best for which type of inquiry.

The Library of Congress Classed Catalog for Music

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THE MUSIC DIVISION in the Library of Congress has the only classed catalog devoted to music in the United States. While not a perfect instrument, it does provide adequate subject analysis of the collections, and improvements in it are continuously being made.

In 1943 the subject catalog for music was converted to a classed catalog. Without any change being made on the cards, the entries were re-filed by class number. They could not, as is customary in other classed catalogs, be filed by full call number because many classes in the M schedule are not Cuttered. The call number, in these classes, consists of the class number and the filing initial; e.g. M25 .R for Wallingford Riegger's *Toccata for Piano*. Thus the filing elements are class number, heading (name or title), title, and date.

The organization of the M classification schedule is, in general, based on medium of performance. This means that the first approach in the classed catalog is by medium. For each musical work processed, a card is filed under the class number. The numbers in the classification schedule are also used as reference numbers, serving as an approach for alternative medium of performance. For example, a work for violin or flute and piano is classified in M219 (violin and piano) with the reference number M242 (flute and piano). The regular numbers also provide an approach by topic or subject. Thus Roy Harris' *Abraham Lincoln Walks at Midnight* is classified in M1613.3 (a work for solo voice and small instrumental ensemble) and has as a reference number M1659.L5 (songs about Lincoln).

But a further approach by musical form, not provided by the classification schedule, is also needed. Beethoven's *Fuge*, op. 137, for example, is classed in M552 because the medium of performance is 2 violins, 2 violas, and violoncello. A card is filed under M552 in the classed catalog, but the approach to the work as a fugue is not provided. To solve this problem, the late C. J. Mazney, at that time on the staff of the Subject Cataloging Division, developed a scheme of reference numbers, "imaginary numbers" in that they are not used for shelving material.

As a part of the scheme, a pattern of decimal numbers was set up.

These numbers are added to class numbers as reference numbers wherever such subdivision is not included in the schedule.

.1 Sonatas
.2 Suites
.3 Variations
.4 Fugues
.5 Marches
.6 Dances
.62 Duple time
.63 Triple time
.7 Potpourris
.8 Orchestral and band music
.81 Symphonies
.82 Symphonic poems
.84 Overtures, entr'actes
.85 Concertos
.86 Operas, ballets, oratorios, cantatas
.87 Songs, part-songs, chamber music

For the Beethoven work previously cited, a card is filed in the classed catalog under M552.4, providing the necessary approach to the work as a fugue.

Helen E. Bush of the Descriptive Cataloging Division has continued to expand the list of reference numbers as need arises. M1105 is a case in point. Separate numbers for solo instruments with string orchestra are not provided in the M1100's as they are in M1005-M1041. These compositions continue to be classified in M1105, but they are also assigned appropriate reference numbers in M1108-M1141. Reference numbers have been established in the M5000's when they could not logically be fitted into the printed schedule. M5100, for example, represents instrumental settings of carols; M5700, funeral music.

When the subject catalog was converted, many cards were filed without the reference numbers being written on them. This was an expedient that had to be resorted to because of pressure of time and lack of personnel. Since that time, large quantities of these cards have been identified and the numbers added. For all current cataloging, both the classification numbers and the appropriate reference numbers are assigned by the cataloger. When the cards are prepared for the classed catalog, the reference number is written in red pencil above the classification number. Cards with reference numbers and those with class numbers only are interfiled.

The ML class provides primarily for the literature of music, but certain classes for music of musicological rather than musical interest are included: ML96 and ML96.5 (holographs and facsimiles), and, in part, ML29-ML31 (foundations in the Library of Congress). Cards are filed in the classed catalog for the music classified in each of these classes. In the near future, cards in the libretto classes (ML48-ML54)

will be added; this is logical since entry for librettos is made under the name of the composer.

The classed catalog, like the other Music Division catalogs, contains a variety of cards: typed entries prepared in the Music Division from about 1900-1943; printed cards prepared in the Processing Department from about 1900-date; multilithed cards with heading under composer, prepared in the Copyright Office from 1947-1957; multilithed cards prepared in the Descriptive Cataloging Division, 1957-date; multilithed cards with entry under title, prepared in the Copyright Office, 1957-date. These last-named cards are used for the music which is classified for shelving but is not cataloged.

The index. An index to the classed catalog was prepared at the time of the conversion, but even then it was known to be inadequate. A new index, developed by Dr. Bush on a systematic basis, was sent to the Music Division in 1962. It contained approximately 7,000 entries; new entries are being added at the rate of about 250 a year.

Library of Congress subject headings are used as index entries when they provide the most direct approach to the material; e.g. Folk-music, Swedish; Violin and piano music. Cross-references are not used. They are replaced by index entries in uninverted form (Swedish folk-music) or in reverse form (Piano and violin music).

Subject headings with a subheading do not provide the most direct approach. In such cases, commonly-used phrases are used as index entries. Examples are Jewish religious music, instead of Jews. Liturgy and ritual, and Safety songs, instead of Topical songs (Safety). A special problem arises when one number in the M schedule encompasses both collections and separate works, or original works and arrangements. A form card has been devised to cover these cases. The text of the form card appears in one of the examples below.

For each class number in the M schedule, for each sub-class or subject Cuttering, and for each reference number, at least one entry is provided in the index. Typical entries are shown below.

The foregoing description shows that the classed catalog analyzes the music collections by medium of performance, subject, and musical form. This analysis parallels that provided by Library of Congress subject headings. The catalog has a good index, permitting effective use by librarian and public alike. Moreover, for those persons familiar with the M classification scheme, use of the index is not necessary—they can go directly to the proper class number in the catalog. Subject catalogers, and not only those in the field of music, will find an inspection of this classed catalog profitable.

Bird songs

M1977.B5; M1978.B5

Mixed voices, Music for

Sacred
Unaccompanied: M2082; M2092
With orchestral acc.: M2020-2028
With piano or organ: M2062; M2072

Secular

Unaccompanied: M1579-M1582-88
With orchestral acc.: M130-37
With piano or organ: M1549; M1552-58

Oboe and harpsichord music
M245-7

Collections and separate compositions, both original works and arrangements, are included in the above numbers.

The Classified Catalog at Boston University, 1948-1964

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A WIDE RANGE of literature exists on the classified catalog as it has been used from early time to the present. In libraries in the United States the few catalogs that have been made in this form have generally been based on the Decimal Classification. Boston University's catalog with its use of the Library of Congress classification is, we believe, unique. At least we have no record of another university using a classified catalog as its only subject approach and basing this approach on the LC. Now that this catalog is in its sixteenth year, it is old enough to warrant a survey view. This paper will, therefore, consider the policies and problems of the development of the catalog as well as its present status.

Some explanation may be helpful to indicate why in portions of the remarks the personal pronoun is used. In a project such as ours, many decisions had to be made and methods of work tried out by the writer. Whenever, for clarity, it has seemed appropriate to indicate personal responsibility or opinion, "I" is used. This in no way overlooks the important support the members of the catalog Division have given to the development of the classified catalog, but is an attempt to record accurately the actual ways in which we have worked. The discussion will consider the following points:

1. Why Boston University decided on a classified catalog
2. How it was started
3. Difficulties that have arisen
4. Benefits that have appeared
5. The Index, its preparation and its value
6. Cost estimates and output
7. The use of the classified catalog at Boston University
8. The LC classification as a medium for a classified catalog

1. *Why Boston University Decided on a Classified Catalog.*

The first point will be mentioned only briefly as reference has already been made to that in an article in *College and Research Libraries* of October, 1953. The decision to use a classified catalog as the medium for subject analysis was made by the former Director, Floyd E. Orton. Mr. Orton's experience was based upon his use of the Crerar

catalog, and his own background in science helped shape his opinion that this would be a workable and useful tool for Boston University. Actually, there was no preliminary planning, and theoretically this was bad; but in practice no undue hardship in the work and no extraordinary costs resulted.

2. *How It Was Started.*

The making of the classified catalog at Boston University is primarily my own work; this was necessary at first, because I alone knew the classification, and it has continued to be the most practical division of work—but those who know the manifold responsibilities of a centralized cataloging department know that to make this possible, a chief cataloger of sound ability and experience was a necessary adjunct to this project. The Library has been fortunate in having this position held by two superior persons during the development of the catalog. This is important, because good work cannot be accomplished without loyal support and cooperation; that we have succeeded, as we feel we have, is due to this happy fortune. In the early period of our work, my feeling about the whole project was quite objective. I was willing, yes interested, in attempting a classified catalog, thinking of it as an unusual professional experience. Later, naturally, I became deeply interested in the work and concerned that the result be one of creditable quality and practical usefulness to our university community.

When it was decided to begin the classified catalog, we had two lots of materials; one, the new books coming in each day, and, two, a backlog of several hundred titles partially processed but not classified. All classification had been stopped in June, 1948, when it was decided that the project would await my reporting for work on September 1. Books were given temporary cataloging and circulated by author and title during that summer. So, on September 1, 1948, we began. At that time we had one professional cataloger, one non-professional, assistant and part-time student typists. As it was necessary to do current holdings and start reclassification and recataloging at the same time, I started by assigning the class number and the alternative numbers for both types of materials, leaving to others the shelflisting and further aspects of processing. Much of the time I worked from cards without seeing the books; for, from the beginning, we have used as much as possible the work already done on a title by the Library of Congress. With the first book done, we had: (1) a book in LC on the shelves; (2) one or more cards in the classified catalog, and one or more subject reference cards in addition to the usual complement of cards for the shelflist, author, and added name and title entries. It was decided to use LC subject headings as our primary index of terms and be as liberal with subdivisions as we wished.

3. *Difficulties That Have Appeared.*

One decision we have made which violates the 'canons' is that we

have not made an index by numbers used, so we cannot tell for how many topics one number has been used. In theory this is wrong, in practice it has not yet been found to be inefficient. The precision of the greater majority of LC numbers compared with those in the DC alleviates the danger of unnoticed over-crowding. There are areas, certainly, such as QC173, where there is far too much material. But there was a like situation in TK9000 (atomic power) where we had only two numbers a year or so ago, and now we have TK9000-9401 with room for considerably more expansion in that subject area. Aside from the over-crowding of a few numbers, there is only one type of material which is consistently awkward to reflect adequately in the classified catalog. Let me state at once that this is in no way a fault of LC classification but is a problem due wholly to our system of book numbering. The type of material I refer to is a critical study of a work of non-fiction. LC solves this problem in its own collection by the use of double author numbers. Inasmuch as we do not use author numbers, we cannot do this. We have, for example, two criticisms of Henry George's *Progress and Proverty*, and our reference card directs the reader to each title individually by class number and author. This problem can be solved if we put into effect the modifications that are now being considered. (See Section 7 following.) Another difficulty we anticipated was that in withdrawing books we might not 'catch' all the references made if we did not have a number index. I decided that if a cataloger could catalog a book, he should be able to de-catalog it. We have not yet withdrawn heavily since we need the collections as they are reclassified. Our procedure is for a notice to be sent to me with the cards for any book to be withdrawn when its classification number is unique in the catalog.

There is one difficulty inherent in all subject catalogs, and that is what to do with the mass of entries under broad general topics (i.e. Economics, Civilization, etc.). Although LC breaks down general works by form (treatises, popular works, juveniles, etc.) and by date (such as Early works to 1800, 1801-1950, etc.), the use of a classified catalog offers no real solution here. I am in agreement with those who feel that such material is best handled in any subject catalog by a direct reference to the number area in the stacks and no individual subject entries. This has not been done, however, in our catalog.

4. *Benefits That Have Appeared.*

One of the surprising elements of classified catalog work is the discovery that the terminology, which weighs like an albatross on the cataloger in dictionary cataloging, is actually something over which it is possible to have considerable mastery. This point has been made before, but the first realization of it is an exciting moment for a cataloger. One uses the LC subject heading list only to the extent it is helpful, varying terminology as long as it does not violate basic principles of subject headings, and the resultant flexibility and sensitivity

of approach is a delight. That pitfalls occur in local schemes of classification or local subject heading lists is well known, and the costs are heavy in rectifying the results of such enthusiastic and misguided work. But in the classified catalog work, once it was determined to use a tested subject heading list as a master control and keep the variations subordinate to its main headings and in principle aligned with its practice, I found myself working with unexpected freedom. I had freedom to express inter-relationships and aspects of topics impossible to bring out in traditional subject work, and I can do this without making an overly-extensive commitment of time, money, and material. I am doing this, not simply for a specialized collection, but for a university library collection.

Among other benefits of the classified catalog in fields such as psychology, economics, anthropology, *etc.*, where new concepts are being developed and where new terminology is rapidly appearing, the flexibility of the index terminology renders results of higher quality and is more responsive to the reader's need. I am not saying that our terminology satisfies the sociologist or psychologist; but, with freedom in choice of subject subdivisions, we can go far toward expressing the relationships he is developing. A reference may be used for any new topic, thus getting the reader directly to the subject field without the frustration of being referred to a word which, to him, is out-of-date or inexact. In our practice these are, of course, *see* references from the LC accepted term; but the user of the catalog is unaware of this. *See also* references are likewise easy to include and as direct, but in most cases they are used sparingly. I have always felt they were almost useless in a large catalog. It is in the possibilities for indicating new developments of knowledge, in the quick response to the need of expressing subjects that cross traditional fields and unite into new concepts, that we feel the classified catalog, through its index, is able to offer unusual help to the scholar.

5. *The Index*

A. *Preparation*

Any discussion of the advantage of the classified catalog leads directly to the fifth point, which is: How was the index prepared? Discussions on the classified catalog premised on the Decimal classification refer to its Relative Index as the necessary adjunct to the catalog as, of course, it is. Visiting European librarians have told us that, although they may have a classified catalog, they had either no index for the public or a very limited one.

The absence of a relative index to the LC has always made its application more difficult. Only within the last few years has there been any indication that the LC is working toward one. This is so recent and additions are so few in the Topical indexes, they offer little help at present. The subject heading list and the brief topical indexes at the ends of the separate schedules continue to be the bases

of all major approaches to the schedule. It was, therefore, necessary to set up our own index, and in the first two years or so, the LC subject heading list was of considerable help. Perhaps it would be of interest to review how our reference librarians and catalogers helped shape the policies developed in our index work. Weekly conferences were held during which the reference librarians reported any difficulties they had encountered in using the subject index. We discussed new terms that had been adopted and how we could express new concepts of knowledge. Because it had been decided to eliminate phrase headings whenever possible, we rely on the noun term, subordinating inverted phrase and other subdivisions to it. This means that some subject reference cards become rather lengthy. The extent of the references under U.S. became a problem, and the reference librarians suggested we remove those which were subdivisions of U.S.-History and set them up on separate reference cards to be filed alphabetically under U.S.-History whereas the general U.S. reference cards would be filed before all entries of U.S. as author. The same procedure was later adopted with subdivisions under *Labor* where we removed all the references for Labor Unions and directed the reader to them from the general Labor reference card.

As the work has progressed and as reference to the major areas of knowledge are now established, recourse to the LC subject heading list is less often needed except to check the Supplements for new terms and references. The *see also* references within the schedules are helpful at times since they add some indication of LC policy. In addition to the absence of a relative index, the use of LC is also handicapped by the lack of any good interpretation of the applications of the classification. As our index has developed, of necessity we have had to develop a body of data recording LC policy as it can be observed from testing the schedules and from their use as evidenced by the numbers on the printed cards. Our index has, in large part, already been described in the *College and Research Libraries* article, but some changes have, of course, occurred. More definition cards are now used to acquaint the reader with the interpretation of a term as it is used in the classification.

All *see* and *see also* references are traced on the authority cards. When a *see* reference refers to a topic that may have several aspects of subdivisions, it is set up as follows: direct number reference is made first to the largest area of this topic, or to the one which is most commonly used, and then the card states, "For specific aspects of this subject consult the subject references under [*topic*] in this Catalog." The first use of this form came very early in the development of our classified catalog when reference was necessary from the term Spanish America (not used by us) to Latin America. Under Spanish America there is first a direct reference to F1401-1418 (the area in the classification that would be most commonly used), and then the direction statement is added to cover all of the subdivisions listed under Latin America, such as Economic conditions, *etc.* It has also been necessary

to develop a new type of reference for variant forms of personal names when the person is both author and subject. That is, under the pseudonym or variant there continues to be direct references to the subject number for the person, then the note is added, "material by this author is found in this catalog under [official form of name]". This same kind of reference is used for changes of names in non-personal authorship, for example, Gold Coast to Ghana.

In a few cases general reference cards are inserted from terms which are not used and for which the usual *see* form does not seem applicable. An example of this is in the reference under Topography where we note:

> "Scientific physical descriptions of geographic regions are entered under Physical Geography (GB) in the Classified Subject Catalog. Works on drawing or reading of maps are entered in (GA130; GA151) in the Classified Subject Catalog."

When subject terms are not clear, or may have two meanings, a statement of policy is inserted in the index under the subject heading:

> FOUNDATIONS
>
> "Material referred to here is limited to that concerned with buildings and engineering. For material on Foundations, meaning learned and/or charitable institutions consult the references in this catalog under ENDOWMENTS."
>
> References to legal aspects of charitable foundations will be found under *CHARITABLE USES, TRUSTS, AND FOUNDATIONS* in this Catalog."

Generally the index has developed as we expected, reflecting LC's choice in subject headings in all major uses of terminology, and utilizing in the subdivisions the best of the schedule terms or any other appropriate terms. It has seemed to me, as mentioned above, that from the beginning, despite the fact that I am working under a mandate to create a classified catalog, it does not follow that I should overlook any part of LC subject heading practice that I can use or adapt—and having accepted the LC classification, I can see no value in attempting to superimpose on it a series of local decisions that would make it a parochial system with little or no relation to its origin. This does not mean we have made no local decisions, for we have, but primarily only for special collections and for cataloging pamphlets or some materials collected for particular purposes.

The index is on cards, and each card is made in duplicate, one for public use and one for the authority file. The additions to the index are made in two ways. References for new terms are made when the typist is doing the cards for the title involved. Additions, which are subdivisions of already established headings, or revisions are indicated on slips which come to the typist in groups to be done as a separate operation. These are revised by me or by the Chief of the Catalog Division.

For the first eight to nine years, about twelve hours per week were required for index card typing. Then there was a period of about two years (approximately 1958-60) when additions were done about once a month and required about six hours of typing time. Now, in 1963/64, the typist is doing additions weekly and requires about twelve hours per month. We don't keep any account of the number of references added each year, but a record of the cards involved is kept. In 1962/63 they numbered 2,348 (as against 2,923 in 1960-61 and 2,814 in 1959-60). There are approximately 26,000 cards now in the index, some with only one number reference, but many others with ten or more.

B. *Evaluation.*

We turn now to an evaluation of the index as a method of getting the user to the classified catalog and a comparison of this method with the accessibility of subjects in a dictionary catalog.

Inasmuch as some comment on classed catalogs has referred to them as less useful in the humanities, we might first consider what is done with a topic primarily of a literary interest such as Romanticism. This is a copy of Index references we use:

ROMANTICISM
Art N70
General works PN603
Literary history PN750-759
Literature
American
History and criticism PS173.R6
English
Collections PR1139
Prose PR1301
History and criticism PR146
18th century PR447
Poetry PR571-579
19th century PR457
Poetry PR595.R6
France
History and criticism PQ287
Germany
History and criticism PT361-365
Hungary
History and criticism PH3052.R6
Italy
History and criticism PQ4086.R6
Scotland
History and criticism PR8550
Slavic PG503.R6
Spain
History and criticism PQ6045

Music (Appearance in) ML196
Theory PN56.R7

As the list of subdivisions is examined, it may be observed that the two non-literary aspects are merged in alphabetical sequence with others. The LC subject headings are Romanticism (indirect sub-divisions), Romanticism in art; and Romanticism in Music. In the LC classification itself provisions are much more precise, as can be observed from the examples above. Looking next at the broad topic of Social problems we show some special aspects and inter-relationships that the alphabetical subject catalog does not usually provide.

(Selections from the Social Problems index cards)
Labor and machinery HD6331
Literature (Representation in) PN51
American Fiction PS374.E4
English PR149.S71
Poetry (Representation in)
Collections PN6110.S56
German PT577.S6

Another kind of subject approach is shown by the index card to a person important in several fields such as Benjamin Franklin. Here, the precision of the classified catalog index again becomes evident. The index refers first to E302.6.F8 for general works. Then follows:

As a man of letters PS751
As a printer Z232.F8
As a scientist Z143.F7
As an economist HB119.F8

At the Boston Public Library there were about 500 cards without subdivisions on Benjamin Franklin. These were examined, and, judging by the titles, there appeared to be three concerned with Franklin as a man of letters, thirteen primarily on Franklin as a printer, and eleven concerned with his scientific contributions. None were found that studied him as an economist, but other aspects showed up such as his relationship to medicine, and Franklin as genealogist and a Freemason. Granted a student interested in one aspect of Franklin would find material in either type of catalog, but it seems obvious, in a case such as this, the precision in the Index may permit the student to isolate the material of his special interest more rapidly than he could in a traditional catalog.

Another comparison may be made, this time with Lincoln material. We have about 3,000 cards for material on Lincoln, and about forty-two subject subdivisions are used. True, LC also uses numerous subject subdivisions under Lincoln; the point here, however, is how many of these subdivisions would the student readily assume to exist? How would he be sure what subdivisions might be used in three drawers of catalog cards; and, if he had formulated his topic, how likely would his words be the

choice of the subject subdivision terminology? By being able to see the possible subdivisions before him on cards prior to going to the classified catalog, I believe he is aided considerably in his search.

As catalogers have always known and as documentalists are constantly announcing, the level of retrieval efficiency is determined by the adequacy of the descriptor language.[1] That is why it has seemed necessary to concentrate a major part of time and effort on our index terminology.

6. *Cost Estimates and Output.*

The sixth point, the cost, is of prime concern to every library administrator. At first our chief concern was that we would be bound to require a knowledge of the LC classification or provide for in-service training in it for all our catalogers, while for those especially concerned with the classified catalog a rather extensive experience in the LC would be a necessary pre-requisite.

For those interested in figures, however, we can give a summary statement. In 1963/64 we are cataloging for nine schools and eight departmental libraries. We began in September, 1948, with one and one half catalogers. At the most we have had five and one half. At no time did we have a year without several changes both in professional and clerical personnel. We have done 266,000 volumes as of July 1, 1963, in the new classification (a net figure, less withdrawals). We maintain two classified catalogs (one limited in subject area), four dictionary catalogs, and four departmental catalogs, these serving a total of nine schools or colleges. On the average our catalogers do 3,200 volumes per year.

The classified catalog has full subject cataloging for the central collection and for titles in two of the branches; for the other two branch collections one subject card is included. This has been done with the making of the index using approximately half of my weekly working schedule since 1948.

No scientific study of the use of the classified catalog has yet been made. We can say students use it daily and that they use it without instruction. They must use it successfully, especially the undergraduates, as they do not have stack access, and that is the only way they can get material from a subject approach. We try, at the opening of the year, to have assistance at the catalogs, but we have not been able to man a desk regularly. A few years back, Professor Annette Hoage, then of Atlanta University, studied graduate students' use of our classified catalog and found considerable recourse to it. After experience with the catalog, we believe the student may find that the index gets him to some aspects of subject fields faster and more accurately than does a dictionary catalog, *but* we cannot show case studies of this. By observation of the condition of the cards it can be reported that evidence of use is heaviest

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[1] It was especially interesting to learn that the important Cleverdon Report made this point as its chief conclusion.

where it would normally be expected, the lightest in the areas where it would be equally light in a dictionary catalog. I would like to be abe to report the classified catalog is the very best medium possible and that it should have been revived long ago, but while I may be convinced of this in large part, I cannot prove it. However, it is Boston University's only practicable subject approach to book materials for the undergraduates, and they are using it. We are now, in the spring of 1964, in the midst of a self-study of the way the catalog is used and the level of difficulty in that use. Among the methods being considered which might make access more efficient and still not undermine the integrity of the classified catalog is that of putting all subject cards for literary biographies and subject cards for criticism of individual works in the main author catalog.

7. *The LC Classification as a Medium for a Classified Catalog.*

Although the classified catalog per se is not to be discussed here, brief observations will be made on the LC classification and its special fitness for a classified catalog. The quarterly revisions, the specificity, and the flexibility of the LC are all important factors in any consideration of its usefulness in a classified catalog. As has been noted, Boston University presents the only testing of the LC in a classified catalog utilizing all fields of knowledge. The test is in its sixteenth year, and we are constantly delighted at the possibilities of the LC. It is an aging classification, that is, kept up-to-date by constant face-lifting, giving it welcome vitality. Its very extent and age, however, mean that it is uneven in parts. An overall editing of both the classification and the subject heading lists may be unrealistic to hope for, but it would be wonderful to have! Nevertheless, the classification system does work and does provide adequate hospitality for an ever-increasing range of subject concepts, both simple and complex.

Conclusion

Two years ago an eminent librarian said we were making a mistake to keep on with a classified catalog. It is well known that to date all catalogs of great collections are complicated and cumbersome. It is also known that the catalogs of libraries comparable in size to ours are reasonably workable and we know ours is working—we do not know what will happen when we have a million or two volumes, but we think we have at least a sporting chance. For the way of the dictionary catalog has been well-trodden, and its way is tangled. Can ours be worse? It is possible that it may be better. I believe Boston University has a 50/50 chance for sound continued satisfaction, whereas the institution with a dictionary catalog and the same expected growth hasn't the same percentage in its favor, assuming a status quo in the form of catalogs. And if great changes do come in subject cataloging, they will probably have as little resemblance to a classified catalog as they will to a dictionary. The Chief of our Catalog Division has made the pertinent

observation that the classification numbers will be easier to feed into a computer than subject headings.

Classified catalogs were once in high regard; it is very doubtful if they will return to widespread favor; but when we watch the cycles of history repeating themselves, perhaps it is wisest to conclude almost anything can happen to library catalogs, and probably will.

CATALOGING RULES*

The Descriptive Cataloging Committee and the Library of Congress have approved the revisions in cataloging rules given below. Further details may be found in *Cataloging Service, Bulletins* 59-65, issued July to November 1963 by the Library of Congress Processing Department (available on request from the Card Division, Library of Congress).

ALA Cataloging Rules for Author and Title Entries.

5A (1C). **Festschriften.** The present rule, which directs that a subject entry be made for the person in whose honor a collection is published, has been revised to require an added entry.

5C (1). **Periodicals and newspapers.** The second sentence in this rule states that "a reference or an added entry" is to be made for any earlier title or titles under which a periodical may have been issued. The words "a reference or" have been deleted, making the rule read: "Make an added entry" for such titles. Rule 158-O in the chapter on "Added Entries. References," which refers to this, has also been deleted.

32C. **Initials, etc., identified.** The revised wording of this rule, published in *Cataloging Rules . . . Additions and Changes, 1949-1958*, page 5, has been changed so that added entries instead of cross references are made in all cases of initials representing personal names. Previously an added entry or a reference could be made.

92A. **Institutions whose names begin with a proper noun or adjective.** The Library of Congress has adopted a policy of applying this rule to institutions with names in English in independent countries that were formerly part of the British Empire, as well as to the institutions of the United States and the British Commonwealth of Nations.

* Editor's note: At one time it was decided to publish all catalog rule changes in both *LRTS* and in *Cataloging Service, Bulletins*. The Rules for author and title entries have not been reported, because the entire Code is being completely revised, and the changes will not be put into effect at LC until revision is finished and the new Code published. The LC descriptive rules have been reported in full in *Cataloging Service* but not in *LRTS*. These changes are being adopted by LC as soon as approved by LC and the ALA Descriptive Cataloging Committee, so it was decided that attention should be called to them in *LRTS* even though not publishing them in full here. If there is an expressed need for us also to publish all of them, we can do so.

157C. **Titles added entries.** This section has been deleted and the following substituted.

C. Title added entries are made generously to insure the ready finding of a work, especially one that does not have main entry under the name of a person, by users of the catalog who know the exact title. Make a title added entry for each work, except for

(1) works with common titles that are incomplete or meaningless without their authors' names, such as Collected works, Autobiography, Letters, Memoirs, Bulletin, Proceedings, Report, Symphony, etc., unless they are published anonymously

(2) works with long titles that are involved and nondistinctive, unless they are entered under corporate headings or headings that include form subheadings

(3) works with titles that are essentially the same as the main entry heading or a reference to the heading (e.g., Royal Dublin Society. The Royal Dublin Society, 1731 to 1941)

(4) works with titles that are identical with a subject heading under which they are entered, if the subject heading as used has no subdivision, or with a "see" reference that leads directly to such a subject heading.

Make a title added entry also from any title other than the main title (cover title, partial title, etc.) by which the work is likely to be known.

Rules for Descriptive Cataloging in the Library of Congress.

3:16. **Series notes.** Add superior reference mark 8a at the end of the first sentence and add the footnote on page 31:

[8a] It is sometimes difficult to determine whether a phrase on the title page or cover of a publication is a publisher's name, a series statement, a subtitle, or simply a publisher's characterization of some or all of his books (e.g., A Borzoi book). It is also sometimes difficult to distinguish between a series number and a publisher's stock number. In case of doubt, it is preferable to include such a phrase or statement in the imprint or as a subtitle, or to give the statement or number as a paragraphed note rather than as a series note, without undue concern for consistency in practice. When it is not considered to be a series statement and does not include a number (such as a stock number) it may be omitted entirely from the description.

3:16E. Add superior reference mark 8b after the word "series" in the caption and add the footnote on page 33:

[8b] A series issued in two or more sequences and called "second series," "new series," or by a similar designation has this designation included, with the customary abbreviations, as the series numbering, not as a separate series or subseries.

3:22A. **Contents note. Scope.** In the last paragraph of this section add the following at the end of the first sentence:

Summaries in languages other than that of the text are noted.

3:24. **"Full name" note, etc.** This section has been deleted. The Library of Congress no longer furnishes the full name note in the lower right hand corner of its printed cards. The form or fullness of the heading is not affected by this action.

References to the "full name" note used on LC cards appearing in the *ALA Cataloging Rules* have also been deleted. These are rule 30A (3), footnote 19 (page 53), rule 40B, footnote 4 (page 86), and rule 53, footnote 17 (page 100, and page 7 of *Cataloging Rules . . . Additions and Changes 1949-1958*).

9. **Music.** Changes in 9:2 (Conventional titles) were published in *Cataloging Service, Bulletin* 59. Since the entire chapter is now undergoing revision, the changes are not detailed here.

10. **Facsimiles, Photocopies, Microcopies.** This chapter has been completely revised in order to bring the cataloging of these materials into line with the recommendations in a study of "The Bibliographical Control of Microforms" made for the Association of Research Libraries by Wesley Simonton, associate professor, University of Minnesota Library School. The revision was published in *Cataloging Service. Bulletin* 60. August 1963.

Transliteration.

One addition to the growing body of tables for the transliteration of languages in non-Roman alphabets has appeared this year, as well as several changes in tables already published.

Arabic. The following change should be noted:

In the transliteration table in *Cataloging Rules of the American Library Association and the Library of Congress, Additions and Changes, 1949-1958,* p. 38, after "Vowels and diphthongs," add superior reference mark [4], and add the footnote:

> [4] Vowel points are not printed on Library of Congress cards. The fact that a text is vocalized is shown, however, in a note.

Renumber present footnotes 4 and 5 as 5 and 6.

Chinese. Changes in the romanization of the Chinese language, as published in *Cataloging Rules . . . Additions and Changes, 1949-1958,* page 47, were published in *Cataloging Service, Bulletin* 62, September 1963.

Hebrew. The following addition was made:

In the transliteration table in the *A.L.A. Cataloging Rules for Author and Title Entries,* p. 249, after "Vowels used in Hebrew," add superior reference mark [1], and add the footnote:

> [1] Since 1953 vowel points have not been printed on Library of Congress cards. The fact that a text is vocalized is shown, however, in a note.

Persian. A table for the transliteration of the Persian language and rules for its application were published in *Cataloging Service,* Bulletin 59, July 1963. This is the culmination of nearly nine years of cooperative effort by the Library of Congress and the Descriptive Cataloging Committee.

Limited Cataloging.

In August 1963 the Library of Congress, with the concurrence of the Descriptive Cataloging Committee, discontinued "Limited Cataloging" according to the rules given in *Cataloging Rules . . . Additions and Changes, 1949-1958,* pages 73-76. A study of their experience of eleven years with the rules and of comments received from card subscribers and others led them to the conclusion that a single set of cataloging rules should be in force for all publications.

F. Bernice Field, *Chairman*
ALA Descriptive Cataloging Committee

Shelfreading

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"THE BOOK is missing from the shelf for two days. I fear somebody lifted it."

"Or even worse. It got misshelved."

When I overheard this dialog on a campus in New Jersey, instances of mysterious disappearance in our library occurred to me. Almost all of them turned out in the end as a victory of the conscience. When the school term was over, mysterious re-appearances happened on the shelves, and books were turned in by shy students to the office of lost and found articles. But if a book got misshelved really skillfully, we hardly could expect relief from the above-mentioned office. "A book misplaced is virtually a book lost" stated Professor Ranganathan, and he was close to the truth.[1]

Misshelving is a familiar disease of libraries, and it is so commonplace that one can do little about it. The time of fully-mechanized libraries—the epoch of the machine's error—is still in the distant future. Until then the librarians must operate on the firm basis of human error, and on the less firm one of psychology.

The manyfold differences between closed stacks and openshelf collections are especially notable in the field of shelfcontrolling. In closed stacks the procedure of reshelving books and supervising the job is almost uniform everywhere: the assistant shelves the books, spine up, and the reviser straightens out the rows. The general stock-verification process, which takes place periodically in the library once in every one or two years (by checking books against the shelflist cards) would be the most natural control of order, but since it involves nuisances and confusion in the service, libraries refrain from doing it as long as possible.

As a matter of fact, a little delay in shelf-rectification has no grave consequences in the closed stacks, but it is intolerable in an open-access collection.

In my room for instance—a vast reading room reserved for the social sciences—there are about 11,000 books on open shelves, available to the mood of the readers. The signs: "LEAVE BOOKS YOU USE ON ANY TABLE," or "PLEASE DO NOT RESHELVE BOOKS" are not much help. The nature of browsing follows its own rules, and books do get mixed up. Taking into account some criminally-minded people, who,

apart from the misshelving, keep the collection's integrity in doubt, the continuous revision of open shelves seems to be an inevitable necessity.

The only method available to control the order is shelfreading. A boring job, indeed, which the assistants do not like to do. The sight of students, running their fingers over the dull rows of books in a state of half-consciousness is well known. The monotonous character of the process creates two serious problems. One is the durability of one person's concentration which is based on the individual's personality, and, secondly, the "how" of supervision.

In order to find out what is going on in the relationship of bored assistant and the books, I first divided the collection of my room into shelfreading units. Each unit consisted of about 500 books. (The reference books, which are separated, were specially treated). Then I regularly clocked the work of eleven student assistants (eight girls and three boys) day by day for six weeks, and I found that it takes about 15.5 minutes on the average to read one unit. This was true, however, only for the first 500 books. Two units consumed 34 minutes. Thus, a second unit needed 19 minutes on the average. A significant increase, compared to the 15.5 minutes in the first part, which indicates that the reading of a third section, without taking a long break, would be of dubious value, no matter how much time would be sacrificed.

At this point I observed that the boys' average time was 1.3 minutes longer than that of the girls. I do not dare to draw consequences of that phenomenon as a derivation in the difference in sexes—the sample were too small, and this was not the purpose of my study. But it can be stated that boys seemed to suffer definitely more from boredom than the girls, at least on that team.

After all, the time factor did not reflect alone the merit of the work. The investigation of the quality was the next task, which fortunately coincided with the problem of supervision. For a complete revision of the shelfreading job one should go through the whole unit and reread it, which is, of course, impossible. Thus, before starting my time-clocking processes, I deliberately misshelved some books in the same amount and character in each unit by classification numbers, or Cutter numbers only. When I compared the overlooked mistakes, it turned out as definitely valid, that:

(1) The quality of the work declines when speed increases;
(2) The overlooked mistakes were overwhelmingly in the second unit —which was not surprising. (Amazingly one girl made mistakes always in the first half of her assignment, therefore contradicting the uniformity of my statistics.)

The two points of my conclusion indicate repeatedly that it would be hazardous to assign a third unit (more than 1,000 books) for shelfreading in our library.

When I finished my data collection, I turned to the problem of boredom, which still remained a major issue. Azile Wofford suggests to

assign the shelfreading task to assistants *in turn* "to prevent boredom and to make sure that all take part in the task."[2] This seems to be reasonable although it conflicts with professor Jesse's statement,[3] which is also reasonable and asserts that too frequent reassignment of areas of responsibility will destroy the "pride of ownership" attitude, which the shelver should be encouraged to cultivate. The two suggestions, however, can easily be melded together if the personnel permits such combinations.

As for my room, I have chosen the situation at hand for experiment, telling the assistants that certain books were intentionally misplaced by myself. This was a rather personal approach, done in a friendly, joking atmosphere. Thus my deed appeared not to be a threat, but an appeal for hunting for the misshelved books. The assistants seemed to be animated, at least in the beginning. After my revelation, the time index went higher by (approximately one minute), due to their stressed attention. The number of mistakes at the same time dropped by about 30%!

I do not think that the problem of dullness was solved this way on an absolute basis. When the system was new, the assistants operated naturally with an excitment which was due to the novelty. By the end of the term, however, I noticed an increasing number of mistakes, which was probably because of the growing attendance in the library or of their personal concerns relating to exams. Unfortunately, I was not able to follow through on these last constituents. But it can be stated that in the first four weeks (the above percentage is valid for that period) the system worked with a definite success.

Summing up: some factors which influence the effectiveness of shelfreading can be taken under control, viz. the capacity of the assistants' attention, and the supervision of the work—both to a limited degree, but even so, with a remarkable improvement in the work. The division of the collection into shelfreading units, the clocking of the consumed time, and the deliberate misplacing of books seemed to be effective tools in the process, according to a survey in a college library. As for setting up a competitive "finding game," this depends entirely upon the personal relationship of the librarian and his assistants.

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The Place of the Technical Services in the Academic Library*

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THERE IS AN IMPLIED dichotomy to which I object in the topic we are discussing today—a suggestion of technical services *versus* public services. Why do we speak of any part of a library as though it were not a "public" or "reader" service? Technical processes are not opposed to, but an integral and vital part of, the bringing together of written word and reader, knowledge and student, message and receiver. Isadore Mudge in her classical statement on economies in cataloging[1] speaks of cataloging and reference work as two sides of the same shield.

Would it then be legitimate to speak of these as "direct" and "indirect" services? Not always, for in many libraries the members of order and catalog departments, while working at the catalog, are approached by patrons and have the opportunity to instruct in the use of the library at the time when the student's motivation is highest. And the catalog itself, that joint product of book selection, purchasing, cataloging, and classification, is often the prime medium of communication between library and patron, especially in the academic library. I quibble over the words "technical" and "public" only to point up the value I impute to "technical" services, because of course I must use the dichotomy I object to in order to be understood.

Well then, can we profitably discuss whether it is better to spend more money on books and their processing than on more intensive reference service? This is like trying to assign relative weights to heredity and environment, which are functions and inseparable. I confess, however, to a personal bias toward heredity (or books) because even the best environment (or reference service) cannot produce results unless the potential is there.

Academic librarians (and teaching faculty) are an avaricious breed, and would surely agree that we must spend whatever time is needed to buy all the books we can afford, so the only issue left to us is to determine the optimum time to be spent on cataloging and classification. For example, what depth of analysis in the catalog is profitable as against searching bibliographies and indexes? Many librarians have felt the

* Based on part of a panel discussion at the meeting of the Northern California Technical Processes Group, San Jose, November 16, 1962.

need for annotations such as those the Wilson Company provides on its cards. Would annotations help the patrons and reference librarians enough to justify the time and expense involved?

On the other hand, how much simplification can we achieve without making the catalog undecipherable to the uninitiated? Will the use of red arrows[2] or rubrication[3] of tracings for filing purposes perhaps create more work for readers' advisers (and filers too) than it saves in typing? In teacher-training institutions, do we have an obligation to maintain the traditional type of catalog which students will (for many years) find in the schools to which they are going? I am not implying affirmative answers. I simply say that we do not yet know the answers to any of these questions.

It should be pointed out that though administrators complain of the expense of processing and urge catalogers to economize as though they, catalogers, were the spendthrifts of the family, it has been the reference librarians who have demanded more refinement, greater depth, and, inevitably, greater expense in cataloging. Again I refer to Isadore Mudge, who went to extremes in showing the potential usefulness of every item on the full catalog card and who made the point that work done once in cataloging saved the reference librarians from repeating that work many times. And Maurice Tauber says (from the context I infer an amusing misprint), "Surveys have revealed there is a high correlation between failure in technical routines and the ability [read *inability*] of library personnel to provide adequate readers' services."[4]

But none of this tells us exactly *how* much time, spent on *what* refinements, saves exactly *how* much time somewhere else. Not one of us really knows the optimum distribution of staff between "technical" and "public" services. The only recent quantitative study I have been able to find is that of Littleton,[5] and that is a bare beginning, a gathering of data from the status quo in sixteen libraries. That survey showed that one quarter of the salary fund went for public services and more than one third went to the acquisition and organization of materials.

How long will it be before we have some real research on this question—research in the sense of a laboratory or controlled experiment? Until that time, we are all talking through our hats. Obviously, the required study would be complex, and could probably best be undertaken by the library schools. It is no simple task to graph the two lines: (1) amount of work done in technical departments and (2) amount of work necessary in public departments (assuming that as one declines the other rises) and find the point at which they intersect. This may seem to involve more statistical analysis of tangibles and intangibles than we can handle. But if we may think of the pattern of service rendered at a certain cost as a complex, like the sound wave of speech which consists of many elements, perhaps we could start by isolating and measuring certain of those elements. For example, we might study the work involved in keeping up the record of serial holdings in the public catalog as against the work involved in consulting a separate serial record; or again, analytics

versus bibliographies. It would seem that the library schools might be able to select comparable libraries in which to make such studies. Similar techniques can be applied to evaluating the services of automation, as the Stevens study shows.[6] Such research will give administrators, for the first time, the data they need for their decision making, their games of strategy.

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REPORTS OF MEETINGS

(Editor's note: At its Midwinter meeting in January the *LRTS* Editorial Board decided to renew the practice of publishing reports of meetings—for information and as history. Which meetings and the form of the reports was not decided. The three following came to us, and we're running them as they came. We are desirous of learning reader and member interest and wishes. For instance, should we report meetings? Which ones—only those of RTSD or related ones such as the FID Classification Committee, the Union List of Serials Committee, the Decimal Classification Editorial and Policy Committee? Should the report be very brief or full?

The *ALA Bulletin* publishes Highlights of ALA meetings, ALA publishes *Proceedings* of the Annual Conference meetings, the *LC Information Bulletin* reports meetings, the annual reports of RTSD officers, and the year's work papers of RTSD matters all cover the field. Do we still need meeting reports? The Editors wish to know reactions and thinking.)

RTSD Serials Section Policy and Research Committee

At the Midwinter Conference, the Serials Policy and Research Committee discussed the possibility of establishing a serials news sheet as a successor to *Serial Slants.* It was decided not to promote a separate publication but rather to develop means for utilizing the existing communication facilities offered by *LRTS.*

The Committee also discussed the progress of and plans for further investigations of the following: a clearinghouse for data processing information relative to serials; the preparation of a bibliography of serial bibliographies; library practices in furnishing serial holdings information; and the unit output of serial checkers. Paul E. Vesenyi's proposal for standard location of periodical issue identification (see *LRTS,* 7:294-6, Summer 1963) was presented for consideration. —*Jeanne M. Holmes, Secretary, RTSD, Serials Policy and Research Committee.*

Subject Headings Committee

The RTSD-CCS Subject Heading's Committee met during the ALA Midwinter Conference, January 27, 1964. Present were Committee members Kathryn L. Henderson and Thomas E. Sullivan; Richard S. Angell, Chief, Subject Cataloging Division, Library of Congress, and Margaret Kaltenbach of Western Reserve Library School, a member of the Committee 1959-1963. Rosamund H. Danielson, the Committee Chairman, presided.

Mr. Angell described the present organization in his division with relation to developments in the proposed subject headings code and in the publication of the *Subject Headings List,* 7th ed. On paper, positions have been provided for area specialists who would, as part of their assignment, do research necessary for the writing of a code and manual of subject headings work. Until these positions are filled, however, it is not possible to proceed with the writing. Apparently the recruiting of specialists in such fields as mathematics for the attractive career service at the Library of Congress would be a most direct way of forwarding the production of a code and manual. Mr. Angell submitted an outline in two parts: I. *A code for the construction of subject headings lists,* and II. *Manual; subject headings in the catalogs of the Library of Congress.*

In the discussion which followed, the suggestion was made that when the current major project of catalog code revision is completed, the Section might be in a position actively to support the production of a subject headings code, possibly appointing a special steering committee and, through its Cataloging Policy and Research Committee, sponsoring staff, as in the case of the LC *Descriptive Cataloging Rules,* and later do the same for the revised catalog code.

Regarding the 7th edition of the LC *Subject Headings List,* members were asked to consider an optimum interval between future editions. Present GPO estimates are based on closing the 7th edition with December 1962 entries. It is planned to continue the monthly supplements. By using electronic equipment it would be economically feasible to produce complete new cumulations more frequently than in the past.

Following a suggestion that there was need for more information about new specialized subject heading lists, it was agreed that Miss Kaltenbach would take up with Barbara Dennison the possibility of publicizing in *LRTS, Special Libraries,* and *Wilson Bulletin* current additions to the loan collection which is now housed at Western Reserve Library School and that Mr. Sullivan would discuss this with the Editor of the *Wilson Bulletin.* It was noted that Miss Dennison has a new edition in process of the publication issued most recently in 1961 by Special Libraries Association under the title *Guide to the SLA Loan Collection of Classification Schemes and Subject Heading Lists.*

Also discussed briefly were the need for a bibliography of subject heading theory and for a study of the division of the catalog and its effect upon subject entries.

Committee members were asked to cooperate with Miss Dennison at Western Reserve by arranging for deposit in the loan collection any additional lists of which they might be aware.—*Rosamund H. Danielson, Committee Chairman.*

FID/CR Committee on Classification Research

International cooperation must begin with individuals within individual countries. The backbone of any successful cooperative effort is usually the force

of one man or one small group of people. These opening remarks accurately describe the FID/CR Committee on Classification Research, one of several study committees within the structure of the International Federation for Documentation. Rasmus Mølgaard'Hansen of Denmark, the Chairman of the Committee, has accomplished a great deal because of the effort he has expended to achieve the goals of the committee and because of the hard work of people like Barbara Kyle, S. R. Ranganathan and Eric de Grolier in Great Britain, India, and France respectively. Through careful program planning and a well-run Secretariat, members of the committee have been kept informed of the work of others in many countries. The committee meetings have served as a sounding board for different views on the subject of classification and other techniques involved in the organization of information.

This report of the Committee's last meeting serves as an example of this cooperative effort. Before the FID meeting in Stockholm in late September, 1963, the 16 members of the Committee (representing 12 countries) received fourteen documents which included trend reports from the U.S.A., Great Britain, India, and Scandinavia. News about the "New Classification Scheme Project" to be undertaken by the British Classification Research Group was distributed. Examples of proposed universal classification schemes prepared by members of the Swedish Classification Group were available for study before the Stockholm meeting. In this way more thoughtful remarks were made, and an excellent discussion took place. Language barriers were overcome because informative abstracts in the main languages were included when the reports are distributed by the FID/CR Secretariat.

By acting as a clearing center for manuscripts, preprints, duplicated reports, and by serving as a liaison office, all persons interested in the work of the Committee can be kept informed without delay. As the U.S. member of this committee, I will be glad to make these reports available to interested persons in the U.S.

The major effort of the Committee in 1964 will be an International Study Conference on Classification Research. Plans are underway to hold the conference in September in Denmark. The theme of the conference will correspond to the main function of the Committee, namely, a critical evaluation of experience and trends in the use of classification in the communication of knowledge and information.—*Pauline Atherton, American Institute of Physics, New York.*

Does Dividing the Catalog Relieve Congestion?

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VARIOUS REASONS have been advanced for dividing the catalog. The foremost of these has been the attempt to eliminate complexity—to simplify filing and finding. A second major reason has been the attempt to relieve congestion. This paper confines itself to a discussion of the latter. We shall, for the major portion of the discussion, confine ourselves to the commonest form of divided catalog—on cards, and with a two-part division, into author-title and subject. This limitation is, however, purely for convenience, in order to allow us to concentrate on the principles involved. Toward the close of the paper, the implications of the analysis for other forms of divided catalogs will be considered.

What Is Congestion?

The author has found ten divided catalog articles spanning the years 1939 to 1962 which make specific use of the word congestion, plus three more that are concerned with the concept, although they happen not to use the exact term (Wood, Oertli, and Carnie). Unhappily, some of these writers use the term without making it clear just what they mean by it. The article most helpful to definition was written by Lubetzky in 1939. He states that he finds librarians using the word congestion in two ways. The first way is with regard to physical space per number of users. The second is with regard to a person having to wait to use a particular card drawer because someone else is using it ahead of him.

Does Dividing Help? What the Literature Says

Lubetzky states that, although some librarians are saying that it does, he himself does not see how dividing the catalog alleviates physical congestion; for, given any fixed number of users, congestion of this type is "a function of the number of drawers and feet of space available, rather than of the number of catalogs." He does not add, as he might have, that division commonly requires some duplication of entry, thereby increasing the number of drawers needed. It seems to the author that Lubetzky's rebuttal is correct. Despite some ambiguity due to lack of definition, it still seems accurate to say that, judging from the literature subsequent to 1939, this spatial argument for division is no longer a live issue among librarians, and has been laid more or less quietly to rest.

Lubetzky finds librarians arguing also that dividing the catalog will relieve congestion of the second type. "It is maintained," he says, "that catalog users consist of two classes, those who look for a specific book under author or title, and those who look for unspecified books under the subject; the former require but a quick reference at the catalog, while the latter will use the drawer for some time, studying through a number of cards. Thus the single catalog, by interfiling subjects with authors and titles will keep author and title seekers waiting while a subject seeker is thumbing his way through the drawer."

In contrast to the physical congestion argument, the literature shows that this second congestion argument is very much alive. We find the idea stated unmistakeably in articles spanning from 1939 to 1962 by Wood, Dean, Oertli, Thom (who is summarizing the opinions of the librarians of twenty-three libraries using divided catalogs), Carnie, Harris, Tauber, and Elrod. It does not seem unlikely that some of the writers using congestion less specifically may also have the same thought.

Somewhat surprisingly, the only article to attack the validity of this second argument is the same 1939 one by Lubetzky from which we have already quoted. He says that this argument "disregards the fact that, if the classification of users into author, title, and subject seekers is true, then division of the catalog will greatly relieve congestion at the author-title catalog, or catalogs, but at the same time seriously aggravate congestion at the subject catalog, where all the subjects will now be compacted in a smaller number of drawers than they occupied in the single catalog. To lend this functional argument any apparent validity, one has to assume that the author and title seekers far outnumber the subject seekers; but this has not even been contended. Again, if the number of subject seekers can be shown to be small, then the argument will fall by its own weakness." Lubetzky, the lone critic, thus presented us, twenty-five years ago, with what still seems to be a new thought: even if we relieve author-title congestion by division, we will at the same time *increase* subject congestion. We are robbing Peter to pay Paul, and the subject card user is Peter.

Variables

Now it may be the case, as Lubetzky states, that dividing the catalog will relieve author-title congestion and increase subject congestion. However, it is difficult to see how this result follows necessarily from the evidence presented. At least three sets of variables would seem to have a profound effect upon the answer. These are listed below and quantified according to the values that the author could find for them in the literature based on actual experience.

The first set of variables is the average time per author-title use as against the average time per subject use. We have seen above that the divided catalog literature assumes that the time per subject use is longer. In no case, however, are we told *how much* longer. A search through library literature as a whole reveals some awareness of possible differences.

The Jackson catalog use study tells us that the patrons interviewed "usually used only one subject heading in a given search." It also shows an awareness of possible differences in subject use time in a small catalog as against a large one. Says the report: "The selection of cards under a subject heading in a small catalog was rarely a problem. Interviewers often reported . . . that 'There was only one card.' " However, for larger libraries, "since the number of cards under a subject heading frequently exceeds 100, rational selection from such files requires time and effort on the part of the user." There are, unfortunately, no times given. Rather than just taking a guess with no evidence, let us refrain from quantifying them.

The second set of variables is the number of author-title drawers as against the number of subject drawers. (We assume an equal number of cards in each drawer.) It is not at all clear from Lubetzky's article just what was assumed in regard to the relative number of drawers in each division. In practice it would of course be extremely unusual for the two parts of our divided catalog to contain exactly the same number of cards and drawers. It would be just as unusual for any two libraries to have exactly the same author-title-card to subject-card ratio. Unfortunately, the author has been able to find nothing in print that gives any basis for quantitative generalization, even for a particular type of library, or for a specific library. Therefore he is forced to fall back upon one specific case familiar to him. The divided catalog of the Douglass College Library, New Brunswick, New Jersey, in the Fall of 1962 contained 330 author-title drawers and 210 subject drawers, the two parts of the catalog showing thus a ratio of 210/330, or 7/11. How typical this ratio is, the author does not know.

The third set of variables is the number of persons wanting to use the author-title cards, as against the subject cards, per unit time. Lubetzky says that "to lend this . . . argument [that division relieves congestion] any apparent validity, one has to assume that author and title seekers far outnumber the subject seekers." However, he says: "This has not even been contended." The best evidence to date, a *State of the Library Art* summary by Frarey, indicates that, considering the library world as a whole, there is no significant difference between the amount of author catalog use and subject catalog use. If, however, we are considering just one particular type of library, there are differences. In the most extensive recent study of catalog use—that of Jackson, mentioned above—the public libraries attracted more searches for subject material than for known items (the latter being shown to be usually an author-title search); but at the larger campus and specialized libraries, the proportions were reversed. At the one extreme, in the metropolitan public library branches studied, the author-title users were 38% and the subject users 62% of the total users. At the other extreme, in the special-purpose libraries studied (special subject libraries, 5 of 6 of which serve professional schools), the author-title users were 57% and the subject users 43% of the total users.

There are no doubt other sets of variables that should be taken into account. We have seen, for example, that the number of cards per subject heading would undoubtedly affect subject use time. However, this paper only claims to be a beginning, not an end. Let us, for purposes of illustration, assume randomness of distribution and use, and proceed to some tentative conclusions on the basis of the variables we have discussed.

Relative Congestion

The rate of user occupation (per unit time) of the drawers of either part of our divided catalog is determined by the quantitative values of the variables appropriate to it. The greater the rate of occupation, the greater the congestion. At this point, by way of illustration, it would seem of interest to test Lubetzky's statement that, after division, the subject card drawers will be more congested than the author-title drawers. The greater the number of users and the longer the per-use time, the greater the rate of drawer occupation and hence congestion. However, the greater the number of drawers per divided catalog section, the *less* the congestion. Thus for each part of our divided catalog, we determine the rate of drawer occupation by multiplying the number of users by the average time per use, and then dividing this product by the number of drawers (or multiplying by the reciprocal of this number). Since we are here going to compare only the relative rate of drawer occupation, we can use relative, rather than absolute, quantitative substitutions. Thus, for example, instead of 330 and 210, we can use 11 and 7 (330/30 and 210/30) for the relative number of drawers in each section of our catalog.

For simplicity let us quantify at once the case least favorable to the author-title section. If Lubetzky's statement holds true for this case, there will be no need to test the less favorable cases as well. This least favorable case is that where the author-title users form the largest percentage of the total users. In our data, this occurs in the special subject libraries studied by Jackson, where author-title users were 57% of total users, and subject users the remaining 43%. Our rate of occupation for the author-title section is, then 57 multiplied by the average time per author-title use (whatever it may be), this product then divided by 11, the relative number of author-title drawers. The result is 5.2 multiplied by the average time per author-title use.

In like manner, the rate of occupation of the subject drawers is: 43 multiplied by the average time per subject use, this product then divided by 7, the relative number of subject drawers. The result is 6.1 multiplied by the average time per subject use.

Thus it appears that, since 6.1 is a larger number than 5.2, the subject drawer rate of occupation, and hence congestion, is, as Lubetzky states, greater than author-title congestion, *unless* it takes at least 6.1/5.2 or 1.2 times as long for an author-title use as for a subject use. On the surface, this seems unlikely. Certainly, as noted earlier, it is contrary to popular belief. However, until there is much surer identification of all

the significant variables, and firmer data for them, it seems sensible to say that these conclusions are tentative.

Other Types of Divided Catalogs—Including Books

No matter how we divide our catalog, the congestion problem may be analyzed in the same general manner as just illustrated. If, for example, we had a three-part division into author, title, and subject, each of the three parts could be analyzed by means of the same types of variables already identified. Although the methodology is of a general type, we would of course expect different specific answers depending on the particular method of division and the particular library situation.

The same general principles of analysis are applicable also in the case of a divided book catalog. Instead of card drawers, we will be concerned with the number of physically-discrete volumes. As a normal volume of a book catalog may be expected to hold many times the number of entries in a full card drawer, the congestion per volume could, if use were heavy, be many times that of card drawer. Book congestion would also be raised above card congestion by the fact that if the user had to look through several volumes—say even an average of two or three—to achieve his use-aim, his per-use look-up time would be higher than if the catalog had been on cards. Balanced against these congesting factors is the offsetting one found by the author that the book catalog tends to be relatively more economical than the card catalog to produce in multiple copies, and the more copies, the less the congestion. But even if the trend is back to book catalogs, the current common catalog form remains, and is likely to remain for some years (See Newton's First Law of Motion), the interfiled card.

Conclusions

The reader may be a trifle disturbed to reach the conclusion of this paper without having had answered completely for him the title question—Does dividing the catalog relieve congestion? We have not, for example, faced the problem of congestion *before* division, to be able to make a comparison with *after*. If the reader can see from what has preceded that the question is far too complex to answer satisfactorily in a paper of this scope, then one of the author's main purposes in writing it will have been achieved. For the last quarter of a century, in article after article, librarians have been making glib, sweeping statements about the relationship between dividing a catalog and catalog congestion, often without bothering to make it at all clear what they meant by congestion. However, even the modest illustrative analysis of this article shows that the divided-catalog-congestion relationship is highly complex, depending on the interplay of several sets of variable factors, for some of which quantitative data does not seem to be available in the literature to date. It is to be hoped therefore that subsequent advocates of dividing their catalogs will exercise more restraint than their predecessors in telling us without evidence how division relieved their congestion prob-

lem. Indeed, it may have. It is fact, however, that, in the face of the evidence of quantitative analysis, we are sometimes forced to the painful task of revising and amending our most cherished beliefs. Where is the *quantitative proof* that division relieves congestion?

Further evidence toward answering definitively whether or not dividing the catalog relieves congestion would seem to depend on two sorts of additional knowledge: (1) All the pertinent variables have not even been identified. This would seem a reasonable first step. Beyond this, reliable results are not possible without accurate quantification of the identified variables. Since published data was found to be extremely limited, there is a clear need for the systematic collection and publication in generally-available form of broad and representative samples. Such data is a *sine qua non* for any study of absolute, as opposed to relative, congestion probabilities. (2) There is need for a much more rigorous mathematical analysis by application of probability theory than is given here. Congestion has not been defined here with mathematical precision. It can in fact be defined in several different ways, depending on what the analyzer feels is the most interesting or important aspect of the problem to investigate. Such analysis may find, as did the author in one experiment that, based on the actually-observed catalog-use traffic over a period of time, actual congestion, even at busiest times, is so low as to be of negligible importance. If this is the case, congestion is not an impressive argument for division. On the other hand, it is possible that investigation may show that congestion is in fact a significant problem. Or it may be discovered that the answer is not a simple yes or no, but rather: sometimes yes and sometimes no; or in 90% of the cases of public libraries serving populations of 50,000-100,000, yes; in 23% of the cases of libraries with less than 100,000 volumes, no; or something of the kind.

It is hoped that this article will encourage those persons with the requisite training to investigate the problem further.

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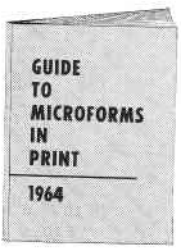

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The Library Catalog: Focus On Form*

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THE PAST DECADE in cataloging in the USA began with a critical examination of the governing cataloging rules, which determine the intrinsic functions and character of the library catalog, and a proposal for their revision. This revision was the subject, among other discussions, of the 1956 GLS conference entitled *Toward a Better Cataloging Code*.[1] It has since had international repercussions[2] and is now in the process of completion. More recently, interest in the extrinsic form of the catalog, long a dormant subject, has been revived in consequence of technological developments which offered new possibilities, and the 1963 GLS conference focused on this subject. The result is an interesting and valuable account of thought, observation, and experience for which the profession will be indebted to GLS, the participants, and the Director of the Conference.

The participants included seven professional, or "conventional," librarians and two nonlibrarians concerned with the problem of information. The former were to concern themselves with mundane library problems and their solutions and the latter to challenge the library audience to greater vistas and to leave them with haunting questions. Appropriately, the two nonlibrarians were accorded the opening and concluding statements. Herbert Menzel, of the Columbia University Bureau of Applied Social Research and author of a *Review of Studies in the Flow of Information Among Scientists,* began with a discussion of "The Information Needs of Current Scientific Research." In common with others, he is concerned about the modern scientist who has come to be regarded as the man in the front line of progress, fighting to advance the frontier of knowledge, and in need of a constant supply of all kinds of information to wage effectively his battle in the interest of society. Unlike the traditional scholar, however, he is not the bookish type. He does not frequent the library, is not always aware of what he really needs, and has neither the time nor the patience to pore over catalogs and volumes to search for needed information. What he requires to promote his work is an information supply corps that will examine all avail-

* A review of *Library Catalogs: Changing Dimensions;* the twenty-eighth annual conference of the Graduate Library School, August 5-7, 1963, edited by Ruth French Strout. Chicago and London, The University of Chicago Press, 1964.

able sources, extract and distill the information contained, capsule it for easy and instant use, and supply the capsules when and where he might need them or might be benefited by them. This is, of course, what a special library functioning as an auxiliary to a research team may attempt to do; but is this the kind of service which a general library of a popular or scholarly character could or should undertake to render—to its multifarious clientele? Menzel does not say it, but his treatment of the needs of science inferentially characterizes the limitations of the traditional library's service and of its catalog which he sees "at the heart of this challenging situation."

Thus the problem of the catalog was rather obliquely introduced, and the eight papers following all focused on it. In "The Changing Character of the Catalog in America," David Weber reviews the various purposes the catalog was originally designed to serve and the forms it took, its evolution in form and function since that time, and the effect of technological developments on the form of the catalog in recent years. Discussing the relative merits of the various forms and of their methods of preparation, he stresses that no one form is best in all situations and also that, fundamentally, the value and effectiveness of the catalog will be determined by the kind and quality of cataloging embodied in it rather than its form or method of preparation—a point which deserved greater emphasis in a conference devoted to the problem of form of the catalog. However, two of the opinions expressed by Weber should be questioned. Touching on the function of the catalog he asserts that "A catalog should be designed to answer questions as to what books are in the library—questions of physical accessibility." This may be merely an ambiguous statement, but it also may echo a popular and erroneous notion that the catalog is concerned with books as physical items only and not as representation of the intellectual works contained in them, which may be found in a library in different physical forms and under different labels. This is an important distinction which cannot be disregarded in a serious discussion of the catalog. Another dubious point is Weber's assertion that "A microfilm catalog is probably as rapid to use as the card catalog once one is accustomed to the machine. . . ." It is difficult to see how the idea of a microfilm catalog can be entertained in view of the practical impossibility of keeping it up to date, of which Weber himself was aware, and the operations involved in its use.

Weber's review of the catalog in American libraries was logically followed by Felix Reichmann's account of "The Catalog in European Libraries." This is the longest of the nine papers presented, equal in size to the two which precede and follow it. It contains a wealth of information and a bewildering mass of details about the variety of catalogs found in European libraries in contrast to the relative uniformity prevailing in American libraries. Reichmann notes that, whereas the American librarian generally believes in the unity of the catalog, the European library often exhibits a plurality of catalogs for different portions of its collections. While in American libraries the alphabetical subject catalog

stands unchallenged and classification is used primarily for the arrangement of materials on the shelves, in European libraries the alphabetical subject catalog must contend with the classed catalog, and the arrangement of material on the shelves is often independent of its classification. While the American librarian is faithful to the classification selected by him, for better or worse, the European librarian does not feel compunctions about having several classifications for different portions of his collections. The differences observed in American and European catalogs is most interesting. To be instructive, they should also be evaluated historically in terms of the conditions that have brought them about, and critically in terms of their relative merits. For example, the Berghoeffer system for arrangement of union catalogs (by surname of author only and first word ot the title, with some qualifications) may be requisite where the participating libraries follow different cataloging codes; it does not recommend itself in the same way where a standard code of cataloging rules is used. The paper, as Reichmann apparently senses, could be developed into a special publication on the subject, which is needed; and one wishes that he would go on to develop and prepare it.

In "Duplicate Catalogs in Regional and Public Library Systems" W. S. Geller tells very interestingly how a casual observation made by a visiting librarian led the Los Angeles County Public Library to find a happy solution to a critical catalog problem and to develop a method of considerable potentialities for other library systems. In 1952 the Los Angeles County Public Library found itself with 114 branches, of which only 26 had card catalogs, and with a literally *crying* need to provide catalogs for the others which the administration was unable to meet. A chance remark by a visitor from Sweden about the use of IBM cards to prepare book invoices suggested the possibility of preparing book lists in the same way and of distributing the lists in the form of book catalogs to all of the branches. The experience with this method, since improved in various respects, particularly in respect of typographical quality which originally left too much to be desired, has encouraged active consideration of its application by other library systems in California and elsewhere. Geller is, however, wise to caution that, in matters of form or methods of production of the catalog. "There are no absolutes. . . A system or technique suitable for one jurisdiction might not be suitable for another." It should be noted also that the new catalog is no longer a dictionary catalog but one consisting of author, title, subject, fiction, and foreign sections, and that even the *Children's Catalog* has separate author, title, and subject indexes. It would be most interesting to have a special report on the experience with this divided catalog in a public library.

Geller's conclusion that there are no absolute solutions is confirmed by George Piternick's discussion of "Duplicate Catalogs in University Libraries." Piternick notes the inevitable growth of special branch libraries in addition to the main library of a university and the consequent need of providing duplicate catalogs for them. Obviously, this takes time and money which otherwise might be used to improve the cataloging sit-

uation. Piternick discusses the various measures considered, or tried, to alleviate the problem—by duplicating only some of the entries in the main and branch catalogs, experimenting with closed-circuit television to obviate the need of branch catalogs, and the use of book catalogs—all of which, however, have so far produced no satisfactory solution. Piternick's own suggestion for the university library is to divide its catalog and replace the subject entries by a subject index, not to the collections, but to the author-title catalog—an index consisting of very brief entries without call numbers, and printed in book form to be made available wherever it may be needed. The advantages of such a subject index are, of course, that (1) it will cost less to print because of the brevity of the entries, and (2) it will cost less to maintain because of the omission of call numbers; but the former will be offset considerably by the need to prepare special entries for the index instead of using the already prepared unit cards, and the latter by the fact that its users—including the library's own paid staff—will have to use in conjunction with the subject index also the author-title catalog to locate the materials in the library.

But Piternick's suggestion leads to another question. If the academic library user is to determine first from a subject index *what* he wants and then consult the author-title catalog to *locate* the material in the library, why not plan to have a union subject index produced cooperatively by a number of academic libraries. Obviously such a subject index would be less costly to the libraries using it and of much greater value as a subject bibliography. Better, since LC already produces the *National Union Catalog*, consideration might be given to the possibility of a parallel subject union catalog which might then enable academic libraries to dispense with their subject catalogs or indexes altogether. It so happens that such a plan was actually proposed in LC in 1955, and it forms part of John W. Cronin's paper "The National Union and Library of Congress Catalogs: Problems and Prospects." This paper is of particular interest in view of LC's central role in the cataloging affairs of American academic libraries. In it Cronin reviews the objectives, history, and problems of the National Union Catalog, its present state, the editorial and cost problems involved in the publication of the pre-1952 union catalog, the need and possibilities of a union subject catalog, the problems of LC's own catalogs, and plans for the future of LC's catalogs. Of these, the last part should be of greatest interest to American academic libraries, for the plans contemplate a division of the LC catalogs and replacement of their subject entries by a published union subject catalog. Commenting on the plans, Cronin says that they present problems that "are indeed great but not insurmountable," and that the proposed change in the structure of LC's catalogs "is not only feasible but almost imperative" in view of their inexorable growth. There was, however, no indication of any impending positive action.

Henry Dubester's "Studies Related to Catalog Problems" are, in fact, not too closely related to the problems before the conference but nonetheless provide some interesting and new information regarding the cat-

alog. They were made in response to special questions which arose in connection with the LC automation feasibility study (since published[3]) and involved determination of the amount of text on a catalog card, the number of characters in the heading, the number of entries for an author, the number of entries for a subject, etc. Dubester found in each case that the information wanted was not available and had to be developed, although it was otherwise useful to convey an insight into the character and structure of the catalog, and observed that "one might almost welcome the advent of automation for the sake of the questions that will arise and will have to be answered. . ." Curiously, one of the most important questions that should have and has not been examined in that connection is the possible implication of the code revision for automation. At least three of the studies mentioned by Dubester would have been affected by the revision: (1) the number of characters in the heading—because under the revision both personal and corporate names are shorter; (2) the number of entries for an author—because under the revision the works of a corporate body are entered separately under its successive names; (3) the differences between the names of authors as found in their works and as used on the entries for these works—because under the revision an author is generally entered in the catalog under the name by which he is identified in his works. The merits of the revision for automation are important indeed but appear to be quite unrealized.

Frank B. Rogers' paper, "The Relation of Library Catalogs to Abstracting and Indexing Services" is a philosophical interpretation of developments in the field of bibliographic information service, particularly those of recent years, which the current program of the National Library of Medicine seeks to synthesize. The most important of these developments include the use of the computer for bibliographic operations, the use of coordinate indexing for complex bibliographic searches, and the use of *descriptors* rather than *subject headings* for greater precision in the definition of the subject of a document. The potentialities of these developments when used in combination for the exploitation of "massive bibliographic structures" is quite evident. But when Rogers goes on to assert—merely to assert as a self-evident fact—that these developments "accentuate the primary importance of subject cataloging" and "call into question the fundamental principles of descriptive cataloging as it is now commonly practiced," he simply ignores the history of cataloging thought from Panizzi to the International Conference on Cataloging Principles of 1961 and disregards the bibliographic importance for scholarship of the great catalogs of the British Museum, the French Bibliothèque Nationale, and the Library of Congress which are based on the principles questioned by him.

To cap the conference, Don R. Swanson, formerly of the Synthetic Intelligence Department of Thompson Ramo Wooldridge, Inc., and now Dean of the University of Chicago Graduate Library School, host of the conference, unveiled before the audience a vision of the ultimate possibilities of the computerized catalog under the title "Dialogues with a

Catalog." In this vision the catalog is conventionally impregnated in the "memory" of a computer which can explore it in a manner that no human could explore the traditional book or card catalog, and the dialogues referred to are actually exchanges between the inquirer and the computer. These exchanges are made possible by a "console," which exhibits a keyboard through which the inquirer can communicate his wishes to the computer, and a screen (as in TV) through which the computer can communicate its reply. When necessary, the computer will also ask questions intended to clarify and define the inquirer's wishes in order to answer them best. The system is designed not only to expedite and improve present services, but also to make possible "radically new" services. It is "to operate on ambiguous, incomplete, or unconventional bibliographic information; no matter what is specified, the system should deliver to the requester a list of those items which fulfil the specifications and from which he then may make a selection." It is to respond to a request for the "red book which I checked out yesterday" or the "biology book I used last week," and to requests for material "similar" to a particular item. Indeed, nothing seems impossible for the computer—if one is willing and able to pay the price. That price, as one may gather from the Library of Congress automation study, is by traditional library fiscal concepts astronomically high. Are the prospective returns in service such as to warrant them, even if one could afford them? Are the requests for the "red book which I checked out yesterday," or for books "similar" to a particular book, typical of the "new" services envisioned—and, if so, how much in the prevailing library economy are they worth? Swanson does not ignore the matter of cost; in fact, he offers some calculations and concludes "quickly" that under present circumstances the envisioned service could not be made "economically attractive." But, like Menzel, Swanson did not come to offer solutions to immediate problems, but rather to urge consideration of long-range goals. In effect, Menzel and Swanson supplement each other by calling attention, at the beginning of the conference, to the needs of science and, at its conclusion, to the potentialities of automation. The developments reported in between indicate a general recognition of both, but also the practical constraints of the inevitable realities of library life.

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COPYING METHODS NOTES

Microform Equipment

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In the process of preparing Supplement B (1964) to the National Microfilm Association's *Guide to Microreproduction Equipment*, I was impressed by the number of microfiche reading devices that have appeared on the market since April 1963. It was not surprising that this type of equipment should be developed in this country at this time (See: *LRTS* 8:81-85, Winter '64), but that ten models should suddenly come on the scene in less than a year makes one wonder. It would appear that a number of designers had been contemplating the production of microfiche readers for some time, merely waiting for sufficient interest in this particular version of microform, and on the signal that the race was on had rushed the manufacture of their versions simultaneously with that of their competitors. It will be interesting to see how many of these models survive to become classic items.

A speculation of this nature invites a retrospective study of the development of the various types of equipment that have resulted in an annual business reported to amount to twenty million dollars. A lot has been written about the reading devices used with microforms, and this is understandable as it is here that the user ultimately has to confront this type of information medium. There is less to be found on the other items of equipment: cameras, processors, printers, enlargers and accessories. There are, however, a half dozen directories of equipment in general, one prepared just before the last war, and the rest at intervals since that time.

In 1938 commercial microfilming had been under way for ten years, and libraries had had about two years of experience in making microfilm though they had been using it for a longer time than that. The publication by ALA of two annual reports on microphotography in 1936 and 1937 was followed in 1938 by the launching of a new quarterly journal. The *Journal of Documentary Reproduction*, edited by Vernon Tate who was then at the National Archives, covered the whole field of photoduplication with special emphasis on microphotography. It was to continue until various wartime difficulties brought it to an end in 1942. A grant from the Carnegie Corporation of New York made it possible for Dr. Tate to prepare an extra survey issue of 62 pages covering the equipment that was available at that time. For some of the items tables were prepared listing the pertinent specifications to be con-

sidered before committing oneself to a particular model. It is not surprising that many items were custom-built, in some cases with only a single model in use. What is interesting is that a few items of equipment (e.g. Leica, Photorecord and Recordak C cameras; Seidell Hand Viewer, Stineman Reel Processor, etc.) and many of the manufacturers (from Agfa to Zeiss) are still with us today.

In 1950 and 1951 the Libraries Division of UNESCO made a survey of the equipment available and the problems which faced libraries using this equipment. The results were published in the *UNESCO Bulletin* and then reprinted as a separate publication of 44 pages. Equipment was broken down into five categories, and tables were prepared listing salient features. This makes it very easy to use, but involves a certain amount of Procrustean arrangement and does not allow for full explanation of special features. Coverage is world-wide, including 156 models produced in 9 countries:

France	52
U. S. A.	47
Germany	26
Great Britain	11
Netherlands	9
Italy	5
Japan	2
Sweden	2
Switzerland	2

Coverage for the U. S. is not complete, due no doubt to the lack of response to requests for information.

In 1953 the FID brought out the first part of the loose-leaf *Manual* which was to grow into a 3-volume set kept up-to-date by annual supplementary sheets. If produced today, it would probably be called a *Manual of Reprography*, since this term is coming to be used for this rapidly-expanding field. Under the general editorship of F. Donker Duyvis, it represented information collected from about twenty countries. Financial assistance was granted by UNESCO. It was more than a listing of equipment, as each section included an explanatory introduction, bibliography, list of manufacturers and their equipment, and, in some cases, samples of the media described as well as illustrative sheets submitted by the companies involved. Tabular arrangement was not attempted in view of the difficulty of keeping such tables up-to-date. This makes the publication harder to use but allows for a greater flexibility in compiling the data. A patient investigator can refine the ore in this mine and come up with a wealth of information. The rapid expansion of the field of reprography and the expenses involved in keeping up and publishing the latest news brought the *Manual* to a halt in 1960. Subsequently a section entitled "Document Reproduction" edited by H. R. Verry of England began to appear regularly in the FID's publication, *Revue de la Documentation.* Notes about new

equipment and references to sources of information in a widespread field of literature appear here. National correspondents help Mr. Verry in his arduous task—the difficulty of international coverage grows at a geometrical rate when compared with national reporting.

By 1956 there had been time to evaluate post-war developments in microrecording. Lewis and Offenhauser's *Microrecording* attempted to bring together the disparate fields of microfilming loose sheets (industry) and bound volumes (libraries). These areas overlap at many points, and there are as many analogies as there are dissimilarities in the operations involved. Illustration of equipment appear in the text and five sections of tabular listings serve as a directory of equipment, but there is no attempt to cross-reference these entries. There are 266 models noted from ten countries, and the sequence (except for the reversal of the first two) follows closely that of the UNESCO Survey:

U. S. A.	100
France	74
West Germany	36
Great Britain	17
Netherlands	15
Italy	12
East Germany	4
Japan	3
Switzerland	3
Sweden	2

Beginning in 1954, George H. Davison kept track of developments in microtexts for the Yorkshire Group of the Reference and Special Libraries Section of The Library Association. These annual reports were a good source of what had become available in this medium, and new equipment that had come on the market. By 1962 his burden had been eased by the publication of such sources as *Microforms in Print.* He was prevailed upon to prepare for the Council for Microphotography and Document Reproduction of The Library Association a *Review of Equipment for Microtext.* This 146-page booklet is an excellent companion for the last noted directory and the next one. It describes in fuller detail special points about various models. It has no illustrations but covers an international field and brings the story down to 1962. It is expected that future editions will deal with models appearing in Great Britain and the Continent alone, so as to supplement the following publication's coverage.

In 1958 Dr. Tate procured a grant from the council on Library Resources, Inc. for the National Microfilm Association to publish a *Guide to Microreproduction Equipment.* It was decided to limit this directory to equipment manufactured in the U. S., or foreign equipment which had established distributors in this country. So as to make comparisons between models easier, it was planned to present the specifications for each item on standard data-sheets. Whenever possible these

descriptions were presented on the page opposite a picture (as large and as clear as was available) of the model. The first edition came out in April 1959 at the NMA's meeting in Washington, D. C. This volume was supplemented in 1960 by issue #45 of *National Micro-News* (April 1960), and the next year by issue #51 (April 1961). In April 1962 the 2nd edition appeared, followed in 1963 by *Supplement A* and this year by *Supplement B*. In the 2nd edition an additional category (Special items) was added to take care of complex information retrieval equipment based on microfilm and other models not easily fitted into the other sections. It is anticipated that the 3rd edition, which will come out next year, will have a new section on reader/printers which are now listed either as readers or enlargers. Taking into consideration the models that have been deleted for one reason or another, we find the following break-down of the 338 items that one can procure in this country:

Cameras	53
Readers	79
Hand Viewers	8
Processors	33
Printers	21
Enlargers	31
Accessories, etc.	94
Specials	19

As a guide to the six directories that we have covered thus far, I am appending the following table. It will serve as a contents note for those sections where equipment is listed:

	Tate 1938	UNESCO 1951	FID 1953	L. & O. 1956	Davison 1962	Ballou 1962
Cameras	6+	18–26	Sect. 222.33	147–161	10–39	1–97
Readers	37+	26–35	222.51 222.52	260–280	40–77	99–225
Hand Viewers	34	—	222.6	do.	do.	227–241
Processors	26–27	36–39	222.34	190–193	112–125	243–301
Contact Printers	45–47	38–41	221.3	195–197	103–111	303–339
Enlargers	30–31	40–43	222.7	202–204	78–102	341–389
Access. & Misc.	—	—	—	—	126–130	391–503

Are there any over-all observations that one can make from a cursory examination of this 26-year span of the history of microform hardware? For libraries the first one is that our choice can boil down to a surprisingly small selection of models from a confusing array of variegated equipment. The Recordak Model D Microfile camera appeared on the market just after Dr. Tate prepared his survey. It is still the favorite camera, and in many ways is a better machine than its successors the D-1 (1960) and D-2 (1961). In 1940 the Recordak Model C reader appeared on the market at about $350. It remained at this level until the price freeze thawed following the war, when it rapidly began its ascent to the height of $1375 by 1960. Shortly after this, Kodak stopped production of this versatile model. In 1950 it was the favorite among librarians, and that same year its successor, the model MPE appeared. In 1958 the 3M Filmac reader/printer was introduced, and in five years was joined by some nineteen other models, none of which is entirely suitable for library applications. This brings us to our other observation, namely, that it is taking less time to link cause and effect. Last year the microfiche was recognized in this country after trying to catch our attention for a number of years, and within a year we find ten models of readers available.

Since I have arrived at the subject of my first paragraph, and so that no one will ask me to drop the other shoe, let me list these ten microfiche readers in closing:

Atlantic, MJR-85
Bell & Howell, MF-2
DuKane, 576-75
DuKane, 576-95
Microcard, Mark IV
National Reproductions/Argus, Dial-A-Page
Recordak Filmcard, PFC-46
Recordak Unitized, PK-1013
3M Filmac 100, 23FFH

To these we can add the multi-purpose Readex Microprint, D. Like the Microcard Micro III, this was designed to handle the opaque microform and then it was not such a great step to expand its function to the microfiche and eventually ribbon microfilm. In producing a small (ca. 20 lbs.), simple machine capable of taking all the microforms now in production, and set to sell for $150.00, Mr. Boni has come up with a model that should make it simpler for librarians to make use of the microforms in their care.

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Dewey Abroad

A field survey of the use of the Dewey Decimal Classification in selected countries outside of the United States is underway, sponsored by the American Library Association and the Forest Press, Inc., publisher of the DDC. The results of the survey will be studied by the DDC Editorial Office, the Editorial Policy Committee (representing the Forest Press, the Library of Congress, and the ALA) to decide what changes in the classification schemes can be effected to serve other countries better.

Sarah K. Vann is Director of the survey and is visiting libraries in the Orient; Pauline Seely is conducting the survey in the Middle East and Africa. The project is under the general direction of a Steering Committee composed of Jack Dalton, Rutherford Rogers, Grace T. Stevenson, Raynard C. Swank, and Edwin B. Colburn, Chairman.

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Organization Theory and the Card Catalog*

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THE CARD CATALOG is a way, a path, to the graphic records stored in a library or in a library system. It is not the only way: indexes, bibliographies, guides, and reference librarians may serve as media by which the reader gets to the desired material. The catalog, however, is unique in that it is designed to maximize the use of the collection of the particular library, rather than to give more general information on a subject.

Organization theory offers means of looking at the card catalog in its institutional setting by two main approaches: that of the rational model and that of the natural system model.

The rational model sees an entire organization as an instrument deliberately planned to achieve certain defined goals. The planned instrument idea is carried throughout the organization; each subdivision and each tool is planned to contribute to the achievement of the group goals.[1]

Viewed according to this model, the library is an organization established to achieve certain goals, and, within the library, the card catalog is a tool deliberately planned, established, and maintained to achieve goals consonant with and subordinate to the aims of the library as a whole. Until recently, many librarians would have answered the question of the aims of the catalog readily and complacently: the catalog not only allows the reader to determine the presence and location of specific items wanted, but it also reveals the subject content of the library. Now, however, library literature reveals increasing questioning of how well the card catalog fulfills its aims. Complicated filing rules and mysterious corporate entries are obstacles to the achievement of the first goal, and there is even more dissatisfaction and doubt about the subject approach which the catalog affords. Lack of depth and completeness of analysis, lack of selectivity, inconvenience, exorbitant cost of maintenance, and confusing subject headings are some of the charges which have been brought against the device which has been for so long an unquestioned part of library organization in this country.

"The rational model assumes that decisions are made on the basis

* Revision of a paper prepared for a course in Organization Theory and the Library, School of Library Science, Western Reserve University.

of a rational survey of the situation, utilizing certified knowledge. . . . Changes in organizational patterns are viewed as planned devices to improve the level of efficiency."[1] According to this, the adoption of the card catalog was deliberately planned, and, at the time, it must have seemed the best possible instrument. It is, then, surprising to note that the book catalog and classed catalog, tools which were supplanted by the card catalog, are being re-examined.

The principle of efficiency is the prime criterion for evaluating. Choose the alternative leading to the greatest accomplishment of administrative objectives, if the ones under consideration involve equal expense. If they lead to the same accomplishment, select the least expensive one.[2] Whether or not the original adoption of the card catalog was a rational decision, the catalog is being re-examined by the measure of efficiency. How rational a tool is it for revealing the subject content of the library? How satisfactory is it to the general reader? to the scholar? Should it be used for non-book materials? These are some of the questions that are being asked, and together with the questions goes the plea for more research, because in the rational system, decisions are made on the basis of knowledge gained from research.

The concept of efficiency is bound up with cost analysis. This implies that one can measure the use of the catalog (output) and compare this with the cost in time and materials (input) in order to achieve some sort of satisfactory guage of the value of the catalog. With such information, one can presumably make a rational decision about the catalog *per se,* and compare it with data on other tools. Consequently, we find in library periodicals various studies of the cost of cataloging books in particular libraries and comparisons of the cost between book catalogs and card catalogs. But the difficulty comes when one tries to complete the problem and measure the value of the output. Is it possible to say, this book costs x dollars to catalog, and the resulting catalog cards will be of y value to the user? Adherents to the rational system model would probably admit that such a statement is impossible now; but they would hold that through continued study and research, the equation can eventually be completed.

For purposes of efficiency, the rational system model looks at different parts of the system as they relate to each other. It regards the organization as a structure of parts, each of which can be manipulated to improve efficiency. Applying this to the library, we have proponents of a technical services division, also advocates of a plan for using the same personnel in cataloging and in reference in order to integrate these functions.[3] Centralized cataloging, both on a regional and national level, is an attempt at improved efficiency, as is recognition of the need to coordinate cataloging and bibliography.

The natural system model offers a different approach, but it is difficult to look at the catalog as part of a natural system in a vacuum. Because this approach focuses on precisely that which is not planned, on informal lines of communication, and on reactions and interactions

of persons and subgroups of the sort that do not appear on an organization chart, one cannot make many generalizations.[4]

According to the natural system model, organizations, even though they have explicit goals and planned structure, are nevertheless molded by other forces. The organization, then, is seen as ". . . an adaptive social structure, facing problems which arise simply because it exists as an organization in an institutional environment, independently of the special . . . goals which called it into being."[4] Into this area would come the whole matter of human relations, because "individuals within the system tend to resist being treated as means. They interact as wholes, bringing to bear their own special problems and purposes. . . . "[4] Semantic problems in choosing subject headings could be relevant here, as could the matter of informal groups. Perhaps there is no technical services division in a certain library; yet, informal communication patterns may have been established which help to form more unity than may exist in another library which has such a division in name, but which may be ineffective because of lack of cooperation. Or, relations between personnel in readers' services division and those in the cataloging department could have impacts, good or bad, upon the catalog, impacts not accounted for by manuals of procedure.

The library as an adaptive social structure dealing with graphic records is influenced by changes in the format and quantity of graphic records. The adaptation of the catalog to the information explosion may be looked upon as a process of growth—increasing standardization and centralized cataloging in order to cope—or perhaps it may be regarded as a shriveling up, with the catalog becoming increasingly unsatisfactory, to the point where the library, to survive, must utilize other means of bibliographic control, the computer, for example.

The natural system analyst might view the whole development of the card catalog and its almost universal acceptance in this country as one way in which the library was responding to the nineteenth-century emphasis upon education for all. When the library had been geared to the scholar, bibliographies, book catalogs, and scholar-librarians served very well; but to meet the needs of a variety of people of all educational levels, a simple tool, accessible to all, was needed. (Whether the card catalog is such a simple, accessible tool is another question.) One sceptical of the card catalog could look upon its wide acceptance as a result of other situations, including Melvil Dewey's position of influence, and the decision of the Library of Congress to distribute cards.

The natural system model can be used to illuminate other phenomena. "The organization . . . strives to survive and to maintain its equilibrium, and this striving may persist even after its explicitly held goals have been successfully attained. This strain toward survival may even on occasion lead to the neglect or distortion of the organization's goals."[5] The cataloger so intent upon cataloging "perfectly," in accord with an abstract standard, that he cannot possibly keep up with the incoming material is an example of this. Such a department is striving

to maintain its own equilibrium, but in doing so, may be impairing the achievement of the library's goals.

Both the rational and the natural system models are helpful. The rational view can lead to greater efficiency. Moreover, rational decision-making procedure requires, when means fail to meet the ends assigned, a review of the ends, resulting in a formulation of goals that are possible to meet. This may mean setting new boundaries for the card catalog, utilizing it for one group of readers or for one type of material, instead of pretending that it is all things to all people. With a narrower focus, effective means can be determined and tested. Rational system requires looking at the catalog in relation to other bibliographic tools. The library is a bibliographic system, and the catalog can be deliberately planned to complement or strengthen existing tools in order to form a whole system. The natural system model is illuminating as it focuses upon the informal structures which may work for or against what has been deliberately planned. Latent roles of personnel; the striving for equilibrium of sub-groups; external, unanticipated influences, all receive attention within this framework.

It has been pointed out that a synthesis of the two frameworks as they apply to modern organizations would be valuable.[6] Neither view is complete, and there are instances where one needs both. "The natural-system model tends to focus on the organization as a whole, to take the 'interdependence' of the parts as a given, and therefore fails to explore systematically the significance of variations in the *degrees* of interdependence."[7] Thus the goals of an organization may be the goals of its top administrators, but have little to do with goals of others working within the organization. A department may be striving for greater autonomy, while the administration may be trying to reduce such a tendency. Such tension may be behind a situation which too often occurs, in which "the individual cataloger would seem to be sitting in the box which catalogers have created for themselves, carrying out an abortive process whose results are unknown."[8] At the same time, the cataloger may be frustrated by having the autonomy of his department reduced through economy measures ordered by the administration. Another example militating against the acceptance of interdependence of parts as given, without further scrutiny, is the tension that may arise between departments. If the cataloging department has as its primary aim the efficient flow of material through the department to the shelves, and the readers' services departments are geared to meeting users' needs of a specialized kind, conflict may result.[9]

What is needed, then, is the use of both models, separately and together, to focus upon the card catalog as one means for reaching material to be considered in relation to other means. Information needs are such that they require more than one tool, no matter how improved that tool may be. "Librarianship would seem to need an understanding and ability to generalize concerning the informational needs of its various publics. It needs, too, a way of deriving its parts in the whole proc-

ess by which access to knowledge is supplied. This would require a sophisticated concept of the whole bibliographic process and a study of its various parts in their relation to the whole process."[9] Organization theory can be used to form a system where only isolated segments now exist.

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Duplicates Exchange Union

Additional members are being sought to join the Duplicates Exchange Union, a group of libraries (college, school, and public) which all agree to publish each year at least two lists of duplicate materials available for exchange. The exchange lists are restricted to completely free items, and there are no charges other than paying postage for the materials received. No attempt is made to keep the exchange to a "piece for piece" basis.

The Duplicates Exchange Union is administered through a committee of RTSD'S Acquisitions Section. Chairman of the DEU Committee is Charles Z. Hughes, Library of Medical Sciences, University of Illinois Medical Center, Chicago. Matters concerning policy of DEU should go to Mr. Hughes, but questions from those wishing to join the Union should go directly to the Resources and Technical Services Division, ALA Headquarters, 50 E. Huron St., Chicago, Ill., 60611, where administrative and clerical details will be handled.

The DEU does not cover the same field as the U. S. Book Exchange since DEU is geared to the small college and public library which is trying to build up its collection primarily of domestic books and periodicals.

REVIEWS

(Editor's note: Reviews published in this magazine have a deliberately-chosen view point. That is, reviewers are asked to consider publications primarily on the basis of their meaning and contribution to the areas of our interest: the building of library collections and the absorption, care, and control of the materials comprising the collections.)

Bourne, Charles P. *Methods of Information Handling.* Wiley, c1963, $12.95. (*The Wiley Information Science Series* v.2)

After reading the all too familiar comments about the growth of the world's scientific literature in the first chapter of this work, it is amusing, if not distressing, to compare this work with volume one of the *Wiley Information Science Series* (Joseph Becker and Robert M. Hayes, *Information Storage and Retrieval,* 1963. $11.95). Almost 18% (131 of 735) of the entries in the index to names and persons are the same as those in the index to Becker and Hayes, and a sampling of the text indicates that in nearly all cases both are describing the same article or system in more or less the same detail. In addition, just over 9% (16 of 176) of the illustrations are of the same objects shown in Becker and Hayes, including exactly the same photograph (Bourne, fig. 5-46; Becker and Hayes, fig. 3) of the Jonker minimatrix machine. It is difficult to envisage a rational solution to the problem of redundancy in the scientific literature ever being attained when there is such extensive duplication in the first two volumes of a series, published by a reputable scientific publisher which should concern itself with this very problem.

Apart from this duplication, there is little in the Bourne work to recommend it for library use. Bourne describes his work as "an aid and reference work for those people who are interested in the design of information systems." He adds that "this book provides an illustration of the tools, equipment, and methodology that might be applied. . . . Wherever possible, the chapters are liberally sprinkled with cost estimates, practical words of caution, and reference to the supporting literature." (p. ix) It will, as the author admits, soon be out of date; and since it is almost entirely a descriptive discussion of equipment, and, to a lesser extent, systems based on the published literature, it adds little that is new to our knowledge and probably will not stand up as an historical summary of the state of the art as of 1963. Only chapter three, "Coding: the Indexing Shorthand," which deals with an area in which, to judge from the footnotes, the author has a particular interest and competence goes beyond the general descriptive treatment. In fact, because of its depth, it seems somewhat out of place in this book.

It might perhaps be more accurate to describe this book as liberally sprinkled with photographs (including, for beginners, a truly outstanding picture—fig.5-46—of a simple manual punch) of the usual assortment of pretty girls (esp. fig. 9-40!) pretending to operate equipment, for they far outnumber the the practical words of caution and cost estimates of the text.—*Norman D. Stevens, Associate Librarian for Public Services, Rutgers—The State University, New Brunswick, N. J.*

Tiger, tiger, burning bright
In the forests of the night,
Whose intrepid camera eye
Has caught thy fearful symmetry?

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Well-filed pictures of thine eyes?
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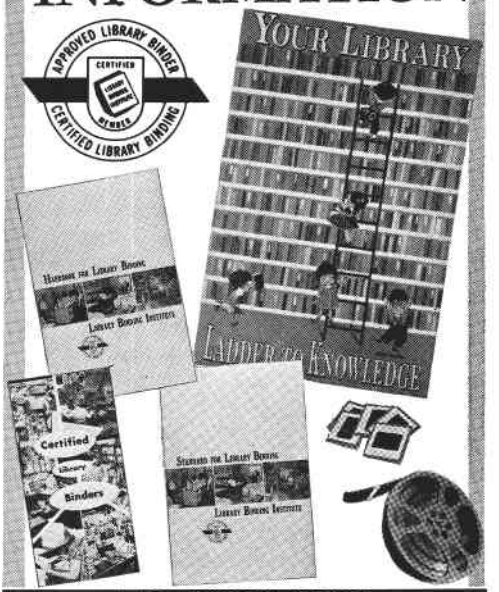

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