## CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developments in Copying, Micrographics, and Graphic Communications, 1971. <em>Francis F. Spretitzer</em></td>
<td>135</td>
</tr>
<tr>
<td>The Year's Work in Cataloging and Classification. <em>Suzanne Massonneau</em></td>
<td>155</td>
</tr>
<tr>
<td>Serials Interests: 1971. <em>Mary Pound</em></td>
<td>165</td>
</tr>
<tr>
<td>Acquisitions in 1971. <em>Ashby J. Fristoe and Rose E. Myers</em></td>
<td>173</td>
</tr>
<tr>
<td>Africa in the Standard Classification Scheme. <em>Nwozo Amankwe</em></td>
<td>178</td>
</tr>
<tr>
<td>Filing Arrangement in the Library of Congress Catalogs. <em>John C. Rather</em></td>
<td>240</td>
</tr>
<tr>
<td>In the Mail</td>
<td>266</td>
</tr>
<tr>
<td>Reviews</td>
<td>271</td>
</tr>
<tr>
<td>ERIC/CLIS Abstracts</td>
<td>277</td>
</tr>
</tbody>
</table>
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- 134 - Library Resources & Technical Services
IN REVIEWING DEVELOPMENTS in library reprography, it becomes more difficult each year to see the forest for the trees. There is an endless stream of announcements, news items, press releases, and rumors about new, or supposedly new, processes, materials, equipment, and projects. Micrographics generates most of the action. Only one of the four significant developments of the year, copyright, is not focused on micro-imaging: the other three—the arrival of ultramicrofiche in libraries, and the microform plans of the Government Printing Office and of the Department of Defense—are all "micro."

Still, we should not let the sweet music and the technological fascination of microforms make us forget that, at least for the present, full-size photocopying in the library is quantitatively and functionally much more important than micrographics. Copying machines, not microforms, have changed the study habits of patrons and are instrumental in the fortuitous conversion of the circulating library into a duplicating library.

The very success of the coin-operated electrostatic copiers is beginning to cause problems. The honeymoon years—when patrons were discovering the beauty of copying and were grateful for these machines, imperfect as they might have been—are over. Copiers are now being taken for granted; many library users feel they have a right to uninterrupted service. Little patience is shown with the frailties of the equipment, of which there are unquestionably many. The coin-copier is losing its pride-and-joy status, and is in danger of becoming a manifestation of the general inefficiency that a part of our public ascribes to the library.

The machines are no worse today than they were yesterday. Nor do they appear to be better. Following the leader as usual, most manufacturers have increased the speed of multiple copying (inconsequential in the library) and have decreased first-copy delivery time (desirable). Unfortunately, in the coin-operated machines widely used in libraries we are unaware of improved reliability, and this is the critical need!

Among the new models, two seem to have features of interest to librarians. With the relatively compact and fast Xerox 4000, it should be easier to make double-sided copies, handy for replacement pages. Demco's copy bond paper, with a self-adhesive strip along one eleven-
inch edge, might be convenient for this purpose. The Pitney-Bowes Model 262 Strobostatic has an unusual feature: strobe lighting. The short-exposure eliminates "page creep," a frequent cause of poor copy.

After a decade of electrostatic copying, there are still no machines available, or even on the horizon, to satisfy needs peculiar to libraries. These may be slow in developing unless the agencies and organizations with expressed interest in the design and specification of machines used in libraries come to the rescue and make this a priority. Books copied on current equipment are subject to wear and tear. Bindings must be strong and flexible to stand up in use. Matt Roberts calls attention to the implications of various use modes for library bindings in an article published in Special Libraries.¹

The increase in library copying is viewed with concern by authors and publishers. Some fear that the interests of copyright owners might be damaged. Revised copyright laws now under consideration both in the United States and Canada might clarify the doctrine of "fair use," which is the legal basis for limited copying of materials without permission of copyright owners. A review of the historical background of librarians and copyright legislation by Chin Kim appeared in the June issue of American Libraries.²

B. Stuart-Stubbs gathered up-to-date facts in his study of the extent and nature of photocopying in Canadian university libraries. He found that only about half of the exposures made involved published material, nearly evenly divided between pre-1965 and post-1965 publications; that the average number of pages copied were few (eight from books, nine from periodicals); and that only 5 percent of all Canadian publications copied were reproduced more than once. He concluded that damage to the interests of copyright owners had not been demonstrated: the number of items copied were too large and the number of copies too small to show material damage to any single author or publisher.³

Delayed in part by the national controversy over cable television, a copyright revision bill could pass the Senate in 1972 but not the House. If reintroduced in the next Congress, the bill might get through both houses by late 1973 at the very earliest.

The delay might lead to judicial rather than legislative resolution of questions raised by Williams & Wilkins v. National Institutes of Health and The National Library of Medicine. ARL and ALA filed amicus curiae briefs in support of the defendant, the U.S. Government; William D. North reported on this suit in the December issue of American Libraries.⁴

A copyright policy implementation proposed by the National Institutes of Health would assure the right of "individuals to make, or have made by any means available to them, a single copy of any article (in a copyrighted publication reporting results of research supported in whole or in part by NIH grants) for their own use." Worried about the proposal, the Information Industry Association asked for hearings.⁵

- 136 -

Library Resources & Technical Services
As Publishers' Weekly put it, "one of the principal reasons that the copyright problem seems to be getting worse is that the technology is getting better—faster, more sophisticated and cheaper—while the discussion remains bogged down at about the level of the first Xerox machine. Users want to copy everything, whenever they wish, without going through the laborious (and often fruitless) process of obtaining permissions." Pergamon Press announced the prompt availability of its back issues in any form (full-size printed, microform of choice—35mm, 16mm, microfiche, positive or negative—or Xerox reprint) with authorization to reproduce for users of the library. Requests for permission to copy individual articles would be promptly considered.

It is understandable that copying copyrighted material is controversial. Reprinting government publications, although undoubtedly legal, may also raise a storm. A. N. Spence, Public Printer prior to his untimely death in early 1972, found this when he announced GPO plans for micropublishing. Established microreprinters were alarmed and expressed their surprise and concern through the Information Industry Association. The National Microfilm Association reacted to a technical aspect of the proposal. According to Spence's statement at GPO's first micropublishing conference on February 25, there was strong objection to the alleged advocacy of microfiche at a 48x reduction ratio. This particular format was worth investigating because analyses of the GPO collection indicated that 90 percent of all publications would fit on one standard size (4" x 6") fiche with resultant economies. A second conference was held in April; the Public Printer also asked for written comments from interested parties, including library groups. The Librarian of Congress and the respondent for ALA (the chairman of RLMS, RTSD), emphasized the paramount importance of assured high quality, regardless of the format chosen. Other respondents seemed to favor 24x over higher reduction ratios. All agreed that compatibility with the existing library microform systems deserved serious consideration. Spence appointed an Advisory Group on Micropublishing and on September 28, this group recommended the use of the 24x, 98 frame, NMA format for microfiche. Simultaneous micropublication in roll form was also recommended. Pending approval by the Joint Congressional Committee on Printing, it was thought that proposals for the microprinting to be done by private contractors might be requested in early 1972. The GPO project was termed "the most significant single development in micropublishing to date."

If the 24x format won a round here, advocates of 48x also had reason to be pleased. In May the National Microfilm Association presented a gift to President Nixon: his own book, Six Crises, on 4" x 6" microfiche enclosed in a clear lucite block, reproduced in 14 rows of 35 frames, at a reduction ratio which could have been about 48x. The work was done by Eastman Kodak. In December the Department of Defense received the report of its Microform Study Group on the
Miniaturization of Federal Catalog Systems Project. The recommended reduction ratio was 48x. Plans entail a gradual changeover from the currently used 16mm magazines and cartridges, and, after April 1973, 48x fiche will be used exclusively. This is another major development which may have great influence beyond the original DOD application.13

**Micropublishing**

1971 was the year of the ultramicrofiche. On June 22 the first sets of the “Library of American Civilization” (LAC), published by Library Resources, Inc. (LRI), an Encyclopaedia Britannica subsidiary, left Los Angeles International Airport on their way to 165 subscribers.14

It was not the first publication of library materials at high reduction (NCR-PCMI was the pioneer). Nor is it significant merely because it demonstrated for the first time an alternate high reduction technology fully developed for mass production. It has, however, become a milestone because of its total systems design. Robert C. Sullivan suggested that “librarians should demand this type of complete systems approach of all future micropublishing projects.”15 The concept of the publication was described in last year's review.16 Few studies of the contents of the collection and the accompanying bibliographic apparatus have been published yet. Though it is still early for user response, it is possible to note now that the technical quality of the microproduction is excellent. The filmed reproduction of text has good resolution and high contrast; the rendering of illustrations (half-tones) is not only surprisingly good at the high reduction ratios employed (55x to 90x), but superior to most seen at any reduction ratio. Images Enterprises, Inc. (UMF Systems, Inc., under their new name), the microproducer, Library Resources, Inc., the publisher, Carl E. Nelson, and—last but far from least—William R. Hawken, consultant, can be justifiably proud of this accomplishment.

This publication has answered the question about ultrafiche image quality. Other considerations must wait for an answer. How many libraries are willing to absorb a new, “closed” system? How many are prepared to buy large, prepackaged collections? How much and what kind of use will be made of the material? What problems may arise? What will be the overall benefits to library service? Time will tell.

The two ultrafiche publishers so far, NCR and LRI, realize that marketing in smaller segments may be mandatory to increase sales. Robert Taylor agrees with many librarians opposing the take-it-or-leave-it package approach in an article appearing in a new journal and suggests “modules” in the $500 to $1,200 price range instead.17 As it happened, by the time this was printed NCR announced $700 packets.18 It is believed that LRI will publish its next large collection in parts, each priced at about $5,000. (The current price of LAC is $21,500.)

The micropublishing scene could not be livelier. The world of books waiting for the camera is large. It will be quite a while before
micropublishers exhaust the material available. There is something for every taste and inclination—from the Bible on ultramicrofiche to Playboy on 35mm film in color. Money is no object: One can pay 65¢ for an ERIC report or $48,000 for corporation files, both on microfiche. Short of money? The Readex Microprint Corporation offers to “ship and wait for payment”; “no interest, no strings.” Some other publishers also give credit to move stock, old and new.

The list of new micropublications and announced projects is so large that any sampling would seem arbitrary and of limited value at best; a look at possible trends might be more useful. However, we first must mention two full-size (“hard copy,” soft-cover) publications which will greatly benefit both libraries and micropublishing. Allen B. Veaner’s Evaluation of Micropublications, subtitled A Handbook for Librarians, is indispensable and should not be let out of hand until its content has been mastered. This LTP publication was originally intended for reviewers in the planned micropublication review program of CHOICE. That much-needed program has been slow in developing. At the end of the year, a new commercial serial, the Microform Review, started a review program of its own.

As Veaner, the editor, commented in the first issue, Microform Review “has been established to encourage the production and distribution of micropublications which afford the legibility, quality, durability, and economy essential to libraries and their clientele.” There will be general agreement on his statement that “the time is especially ripe to carefully evaluate these seemingly invisible products, the acquisition and servicing of which will have very long-term effects upon our collections, our bibliographic tools, and our public-service capabilities.”

The inaugural issue of the quarterly contains articles about micropublishing and about microtexts in libraries written by librarians and publishers. These are followed by reviews of micropublications. Book reviews and a list of recent articles on micropublishing are also included. Hubbard Ballou is the technical editor, and Alan M. Meckler, the publisher. This journal will be valuable to all librarians interested in microforms. The same is true for Robert C. Sullivan’s paper, “Microform Developments Related to Acquisitions,” a concise, up-to-date overview of library micrographics. At the end, he gives good advice on how to order microforms, a rather complex task. To sum it up in one word: carefully. Meticulous care must extend also to the inspection of the publications upon receipt, especially as long as the view presented in Business Graphics prevails in some part of the industry: “True perfection is neither necessary nor economically desirable.” Is this “true” in library use? A 99 percent readable image is 100 percent unacceptable if the missing 1 percent contains the required information, e.g., equations, figures in tables, footnotes. The single page skipped in filming may be the only one needed.

Prospective micropublishers will find an illuminating analysis of
the costs involved in microfiche and ultramicrofiche production in an article by Klaus W. Otten in the November issue of the Journal of Micrographics. Otten concludes that very high reduction is more economical than medium reduction if the edition is large.22

Publishers who wish to consider following the lead of two university presses by initiating their own micropublishing program need such information. Since the beginning of 1971, the University of Toronto Press and the University of Washington Press have been issuing all their books simultaneously as printed books and microfiche. Fiche editions are available at the same price and terms as the original hardcover edition. The thinking behind simultaneous publication is set forth in articles by Ian Montagnes, University of Toronto Press,23,24 Majorie Scal, speaking on “Technological Considerations for the Micropublisher” in Tucson, Arizona at the annual meeting of the American Association of University Presses, states that publishers must “ask themselves not in which mode but in which modes [they] shall publish.” Two examples of this kind of diversification are: The University of Toronto Press which generally uses the 24 x 9.5-frame NMA industry standard, but publishes scholarly works in the former COSATI (60 frame) format and the Trial Lawyers Service Company which, in addition to microfiche, and presumably full-size print, is planning an (audio) cassette program; the latter firm is reportedly to be renamed the All Media Publishing Company.26

Simultaneous publication might be combined with “mixed media” publication. Here the principal text would be printed in full size, with extensive or expensive-to-set appendices added in microfiche.26 Undoubtedly this can reduce the price of the book. However, before savings for the library are counted, the chances and consequences of losing fiche from book pockets should be considered.

Fresh ideas often come from new, small companies. For example, there is the MicroText Library Services’ “book,” a unique combination of title page and index in full size, bound in buckram, with pockets on the inside back cover to hold microfiche containing reproduction of the entire contents of the original book. The volume measures 9” x 7¾”. The current price is a uniform $6.00 per volume. Their catalog lists out-of-print titles from Books in College Libraries. The full-size index is a great convenience. This format permits shelving by subject rather than form, as well as limited browsing.

A “dual format” is represented by Non-Decennial Census Reports, 1902-1945, issued by Greenwood Publishing Corporation. This set consists of Henry Dubester’s Catalog of United States Census Publications, 1790-1945, printed in full size, with the report—over 150,000 pages of data—on microfiche. Carrolton Press, Princeton Microfilm Corporation, and the United States Historical Documents Institute, Inc., are among publishers exploring similar combinations.

Indexed newspapers on microfilm were the “original” dual format publications. The availability of an index is the basis for the wide-
spread use of the New York Times on microfilm. The creation of a good index for important newspapers will undoubtedly enhance their use. Micro Photo's "4 in 1" Index, including the Chicago Tribune, Los Angeles Times, New Orleans Times-Picayune, and the Washington Post is destined to become popular, as it provides a much-needed service.27

We can be thankful that dual-format publishing has made microtexts much more palatable. If it is true "that North America has at last firmly grasped microfiche to its bosom," we must also admit that the embrace has not been very affectionate.28 People still don't like fiche, and take it only if there is no choice; this is true even in the exceptionally congenial atmosphere of the Barker Library at M.I.T., where no effort has been spared to give the best service, easy access, and improved equipment.29

Assuming that micro-iconoclasts are correct in holding that "what people want is hard copy," microfilm maintains and might even increase its importance as the basis of on-demand publishing.

At the Tucson meeting of AAUP, for example, Ralph Ellsworth reminded university presses of the joint ARL/University Microfilms dissertation project as a means for publishing valuable works with a small demand.30 Alan Green's column in the July issue of the Saturday Review envisioned a magically transformed Copyflo machine, simple, foolproof, and inexpensive, standing amidst a few file cabinets containing master films of all the titles the clientele might desire, which would respond instantly to command and turn out full-size single copies in paperback or cloth for $1.00 to $1.50 each.31 It could operate in bookstores, libraries, or anywhere else. Though this will not come about tomorrow, it reminds us that if people really need full-size copy a library microform system ought to be designed accordingly.

"One of the greatest assets of micropublishing, if not the greatest, is the ability to produce one copy at a time, and that the utilization of either film printing or xerography to generate a research base for one individual, and at a reasonable price, is practical."32 The same applies to the library's own microfilming work. However, the current trend toward processes and standards appropriate for edition publishing or for controlled source material only might limit the use of the unique potential of library microcopying.

Between 1969/70 and 1970/71 the reported microform holdings of ARL libraries shrunk by about four million items.33, 34 This loss has probably occurred only on paper and should not cause alarm. These figures can be used best to calculate the storage needs of the reporting libraries and possibly to get a glimpse of some trends. For example, Syracuse University Library, the largest microform holder among ARL libraries, thanks to its huge microprint collection, added 51,449 pieces in this format (7 percent). The increase in the microcard file was 12,534 items (6 percent), and in microfiche 213,134 (78 percent). Micro-}

Volume 16, Number 2, Spring 1972 · 141 ·
who prefer opaques, but not very many. When Falls City Microforms interviewed subscribers to eight microcard projects, all but two stated that they would continue subscribing if a shift were made to 4”x6” transparencies.85

Erasmus Press, Falls City Microforms, the Lost Cause Press, and General Microfilm Co. consistently provide catalog cards for each title. This is laudable, as cards conforming to Library of Congress standards, with current entries and subject headings, greatly facilitate the integration of microforms into a library’s main catalog. The bibliographic control of microform holdings was the subject of an ARL project under an Office of Education contract. The investigators, Felix Reichmann and Josephine Tharpe, have finished their study of the problem and submitted a final report for review by an advisory group.36

In contrast to Microprint, miniprint (low-reduction micro print) has never sold well, but the idea is too good to die. In this process type is reduced to 1/4, 1/5, or 1/6 of the original size, printed by lithography, 4 to 25 pages to a side on both sides of offset paper and bound into volumes. The storage density can be surprisingly high, and the use relatively convenient. A magnifying glass helps reading. For a quick lookup, it will do well enough. There is another advantage: marking and underlining are possible. The Micro-Graphix Division of National Business Services, Inc., publishes industrial catalogs in this format, and Readex Microprint has just begun marketing the Oxford English Dictionary in a two-volume compact edition.

Very low cost equipment (“virtual image” readers) could also be used with microfilm at reduction ratios below 10x. This deserves renewed attention because low reduction films of superb quality are being made for two-step imaging and could do double duty. There is no sign of interest, however. The 1971 vision seems strictly 24/48 and up.

Microform use is spreading to the smaller public libraries. One can only be impressed by the new microfilm installations found in branches of systems such as the Los Angeles County Public Library and the Mountain Valley Information Center (in the Sacramento, California area), to take just two examples. There are others across the nation. Usually planned by librarians who deny being experts, the outstanding feature of such microform services is the perfectly natural way they fit into the normal pattern of the library. The collections in these small libraries, though possibly slow in expanding, do enlarge the potential micropublication market. Micropublishing represents only 2 percent of book publishing; library purchases account for one-fourth of that 2 percent.87

Most micropublishing is facsimile reprinting. The Fourth Rare Book Libraries Conference on Facsimiles, held in Los Angeles on March 6, 1971, approved a list of editorial standards for all forms of reprints, including micro. A final report, to include commentary on technical standards, is planned for 1972.88 The ARL Committee on Availability

* 142 *

Library Resources & Technical Services
of Resources proposed a prototype loan agreement for the reproduction of common printed materials. The recommended conditions include copyright indemnity, payment of costs incurred and a fee, maintenance of physical and bibliographic standards, and unrestricted further use of the volume from which facsimiles are made.

It is possible to side-step the problems that the physical characteristics of new microforms, such as ultramicrofiche, may cause, simply by using the buyer's option; but new problems encountered with current micropublications are inescapable if there is no other way of getting badly needed material. In 1971 several format changes were made or proposed for some types of continuing micropublication projects, usually involving higher reduction ratios. Although the new formats were in accord with existing standards, their adoption may have an adverse effect if they do not fit well into existing library systems. The consequences of seemingly minor changes are not always immediately obvious. Everyone would benefit if proposed changes were discussed beforehand with a panel, which could be brought together by a professional library organization or by a national microform agency such as ARL is recommending.

Micropublications may have greater impact on library service in the future through use of an already existing hybrid technology joining computers and micro-imaging. George H. Harmon predicts dramatic changes in information handling. Klaus W. Otten thinks that microform will be the major information medium in research libraries because it can carry material readable by both people and machines, and is amenable to mechanical processing. Allen B. Veaner calls attention to the automatic by-products of computerized composition and typesetting which may provide adequate bibliographic control.

Microreproduction Equipment

It sometimes seems that there are almost as many new microfiche viewers as micropublishers. Eliminating the look-alikes, old machines with catchy new names, and prototypes in search of financiers, we find the remainder manageable.

What are the trends? The "lap reader" (hand-held viewer) has arrived. The DASA PMR/50 was shown to numerous groups of members of the Modern Language Association of America. According to Dolly D. Svobodny, the reader was liked, although some voiced criticism of "uneven light, screen sensitivity to dust, and a flimsy fiche carrier." The PMR/50 is for sale at $89.50. For the same price, one can buy the RTS 100, formerly DRS Mini-Reader Model 86, first of its kind.

Although the $100 microfilm reader is no longer available, and a $50.00 microfiche viewer failed to materialize, George H. Harmon suggests one that would handle a variety of reductions and media yet cost $30.00.

In the Project Intrex microfilm viewer studies, hand-held viewers were considered but never actually constructed; photochromics and
fiber optics appeared unsuitable for the application. Two front projection viewers, however, were produced. The first projects an image four times larger than the original on a vertical screen five feet from the user, with the fiche positioned by remote control. The second is a desk-top model of the general type of European portables in the 1950s with several improvements. The new WSI FP-113 portable front projection viewer from Washington Scientific Industries, Inc., is more like the hooded, desk-top type (e.g., the "Minox") rather than the familiar Dagmar Super, the NDR Huygens, or the Atlantic "Gypsy" P-50. The lens and the fiche carrier are in front, below the tilted screen, the hood folds down and the price is $179.50. Another WSI fiche viewer, the Model MF, was evaluated in the May issue of Library Technology Reports. (Three other fiche viewers were tested at the same time: the DASA PMR/50, the Micro Design COM 150, and the Seaco 210.)

Dukane manufactures the desk-top reader for Encyclopaedia Britannica ultrafiche film cards, the MICROBOOK 912. This is the model that was delivered to subscribers to the "Library of American Civilization." For $450, it has 90x magnification, image rotation, and brightness control. The Technicolor MICROBOOK 710 Portareader was introduced in December. This is a hand-held viewer with a 75x magnification, weighing less than five pounds, and costing only $165.

The new NCR 456-3-PCMI is a 25 lb. portable for ultramicrofiche. Equipped with a 130x lens, the reader sells for $382.50. Also available are 18x, 24x, and 38x lenses.

The COR 701 is being distributed by the 3M Company. This unique reader accepts both microfiche and roll film at the same time. It is easy to switch from one to the other by changing the focus.

Out of the reach of librarians, but potentially interesting, are the automatic or semiautomatic microfiche retrievers. These machines are quick at finding "packaged" information. They store stacks of microfiches, which can be quickly searched, retrieved, and displayed when an operator keys in a proper code. The Project Intrex experiments are using a Houston-Fearless Card Retriever.

The operation of a new semiautomatic selector, Micrographic Technology Corporation's Model 95 Automated Microfiche Retrieval/Display Device, has been described in Business Week: "An Operator picks the desired fiche cartridge from a rack, inserts it in the viewer, presses a button to pick the fiche and see its index page, then pushes the numbered buttons that bring the desired page into view in about three seconds."

The same firm demonstrated another product, the intriguing MTC Model 750 Microfiche Camera-Processor "that makes microfilming as easy as Xeroxing." The film supply is stabilization-type Agfa litho film, packaged in individual, lightproof envelopes. Film loading is manual (by simple insertion, in daylight). Film movement, shutter, and exposure control are automatic. Pushing the "Process" button starts the ninety-second processing cycle; during that time, the operator may
finish exposing another film. The price is comparatively low: $9,500.

Small Office Microfilm (SOM) entered with two systems. The Milli-File "total microfilm system" (Milli-File, Inc., Elmsford, New York) is almost totally proprietary, i.e., noncompatible. Super-8 film is converted by Milli-File's laboratory into microfiche of Milli-File's own format (10 rows with 16 frames each, with the title block on the side, rather than on top).50

The Micro-8 system, developed by the Micro-8 Company, La Crosse, Wisconsin, uses 8mm roll film in a new, double-chamber cassette, which may be made available for royalty-free licensing to other manufacturers to make it standard.61 In an article devoted to the SOM concept, John and Richard Van Auken discuss the potential of 8mm systems. A comprehensive list of components, available either now or shortly in the future, omits the enlarger- or reader-printer.52

The new Composing Reduction Printer of Eastman Kodak may have great influence upon the future of micropublishing. The apparatus is similar to the optical printer used in the motion picture industry. The CRP can produce from "16mm or 35mm roll film in either single or multi-track, aperture cards and 70mm, 3½ inch, 105mm, 4½ inch, 5 inch, 5½ inch, and 6 inch microfiche." The original film may be further reduced, up to three times.63 (The second-stage printers used in ultramicrofiche production reduce ten times.) With the CRP, a micro-publisher may use a single 35mm master to make duplicating masters in various formats. He may thus choose to publish in 35mm roll form, 60 frame microfiche, 98 frame, etc., and the distribution prints can be of better quality than those obtained with the usual one-step reduction method.

The LS Dixon Prismascope Book Copy Unit, developed at the Scolar Press in England, was seen at the ALA conference in Dallas. The book to be copied is placed over a large prism; the image is reflected through the prism and by way of a mirror into the (litho- or micro-) camera lens. Pages lie flat without having to open a book more than 45°, and there is no pressure on the binding. The risk in photographing fragile and tightly bound books is thereby reduced. And, because the page lies flat, the quality of the reproduction is enhanced.

Two microfilm readers were also evaluated in the May issue of Library Technology Reports: the Recordak Motomatic MPG ($1,415) and the Information Design 201 (with manual film transport). Gaylord Bros. no longer sell the ID 201, but the machine is available directly from the manufacturer for $960.

Eastman Kodak is now delivering the Printer Base ERG, compatible with both the MPG and the Microstar readers. Electrofax paper is used, and variable-length positive copies may be made from either negative or positive film. The MPG-TL/ERG combination costs about $3,500.

The MISI 201 Microfiche Reader Printer, manufactured by Micro Information Systems, Inc., Atlanta, Georgia, features 8½"x11" zinc-
oxide copies, copy paper supplied in bakelite "cassettes," a 5"x8" fiche carrier, 24x standard magnification, and "bilateral" control (choice of polarity?). A coin-operated version is in preparation.

Information Design offers for lease a motorized film transport with image locator for the Xerox Microprinter. Xerox also supplies a motor drive for the Microprinter.

The price of the Dennison-Readex Enlarger-Printer for micro-opaques has been lowered to $2,445 for a coin-operated station. A service-and-parts contract costs from $360 (25-mile radius) to $410 (100-mile radius) per year.


LTP is considering a plan to test again ("in-use") some readers which have been evaluated before and discussed in the Library Technology Reports. The testing will take place in the microtext reading room of the National Archives.

If one considers the many valuable contributions to libraries and librarianship rendered by LTP, and how it is the only agency presently capable of contributing certain of these much-needed services, it is difficult to understand why it leads a hand-to-mouth existence from year to year. It was good news that a last-minute restoration of funds by ALA permitted LTP's continued operation for another year, because there is much work that needs to be done. At year's end, the list of equipment unevaluated so far includes the four currently available ultrafiche readers, a selection of other microfiche readers, the Microproducts 3000, the motor drive for the Xerox 1212 and the Xerox 1414/Dukane Explorer 14, the Eastman Kodak Motormatic MPG-TL/ERG printer combination, the 3M '500' dry-silver reader-printers, the Executive II reader-printer, the Dennison-Readex Enlarger-Printer, and the Xerox Microprinter. Among the copiers, the Xerox 360-I in coin-operated service, the Xerox 4000, the Pitney-Bowes Model Strobomatic 262, and the KeeLectro 1200 have yet to be assessed.

Applications, Audiovisuals, and Facsimiles

Seventeen public library systems in Illinois are using the "Illinois Microfilm Automated Catalog" issued by the State Library. At the Los Angeles Public Library, book catalogs are printed by offset from computer-output microfilm. For internal records microfiche is used instead of paper copy.

The New York Public Library has begun an experiment to determine the feasibility of converting research library catalogs to microfilm. A $10,000 grant from the Council on Library Resources (CLR) supports the project. CLR has also funded a use study of a computer-output microfilm catalog at Tulane University.

Catherine Gaines described a manually compiled subject catalog in...
microfiche that has become a working tool in the Ramapo Catskill (New York) Library System.\textsuperscript{61} Dily E. Madison and John E. Galejs reported favorable experiences with a microfiche system in the catalog department of the Iowa State University library; John G. Veenstra has also commented on this subject.\textsuperscript{62, 63}

According to Stanley A. Elman, the Jet Propulsion Laboratory library in Pasadena is now operating partly as a microfiche duplicating library. He notes user preference for positive microfiche.\textsuperscript{64} L. W. Wachtel examined the use of microfiche in programmed self-instruction. 20x, 60 frame microfiche was photographed from large type "in order to allow easy reading at distances normally used with microfiche readers."\textsuperscript{65} Chandler Smith has written about the application of color-microfiche in teaching pathology at the George Washington University School of Medicine. Color slides and black and white negatives of printed matter are reproduced on microfiche. Leitz microscopes equipped with an adaptor can substitute for microfiche viewers.\textsuperscript{66} The University of Southern California's School of Dentistry plans to use 35mm color filmstrips for a similar purpose because of lower production and equipment costs.\textsuperscript{67}

The transformation of images from one medium to another is included in Wilbur C. Myers' definition of micrographics, whether film is used in the process or not.\textsuperscript{68} Accordingly, Micrographic News & Views published much information on "audiovision," a term for the combination of disc, tape, or film input and television screen output. David Hale prefers "cassette television" in a critical discussion of the subject in the Penrose Annual.\textsuperscript{69} Partly for lack of standardization, audiovision might be several years away, even though the relatively cheap Akai portable 1/4" videotape camera/recorder is currently in production in Japan. By the time Foto-Magazine published a test report in November, 1,000 Akai recorders had been sold in Germany alone.\textsuperscript{70} However, Eastman Kodak's Super-8 videoplayer might precede other videotape systems.\textsuperscript{71, 72} The Teldec videodisc has been demonstrated in color; it may reach the market by "early 1973."\textsuperscript{73} The Teldec disc is for mass production; it costs only pennies to make in large quantities. Springer-Verlag would like to lower the cost even further and find a way to stamp discs with the speed of rotary presses. If this is possible, videodiscs may supplement daily newspapers instead of magazines.\textsuperscript{74} Monday morning sports discs could become very popular.

Joseph Becker writes about a visit to SONY in Japan in the October issue of Special Libraries. He himself used a video cassette recorder with a mixer "which accepts various audio-visual formats—2" x 2" slides, 1/4" audio tapes, audio cassettes, video tapes, film strips, and sound movies—and transfers them one at a time or in combination to a master videotape which in turn can produce hundreds of video cassettes simultaneously."\textsuperscript{75}

The Penrose Annual contains an actual printout from a telenews receiver that looks and feels like a somewhat similar print from an

\textit{Volume 16, Number 2, Spring 1972}
The purpose of Advanced Technology/Libraries is to present to the library community current and potential applications of technologies for their utilization." Becker and Hayes, Inc., published the first three issues under a contract with the Department of the Army. It follows the format of Micrographics News & Views, improving it by continuous printing of the text.

Microinfo, a new monthly news bulletin from England, has an airmail subscription rate of $48.00 a year. If this seems high, one should remember that it provides timely and accurate information. Xerox/Source, a richly illustrated new publication of the Xerox Education Group, comes for the asking. Reproductions Methods and Reproductions Review have merged, appearing since September 1971 under the title Reproductions Review and Methods.

There are numerous references to reprography and micrographics in Rutherford D. Rogers' and David C. Weber's new book, University Library Administration. A comprehensive, concise introduction to microforms and microform use by Fritz Veit appeared in the April issue of Library Trends. Another introduction, with more emphasis on library materials, "Resources in Microform for the Research Library" by Rolland E. Stevens, appeared in the first issue of Microform Review.

Charles G. LaHood states in a paper presented at the Third International Congress on Reprography in London that "microform reading equipment utilized in the research library, although essential for satisfactory use of microforms, is but one of several significant factors affecting its use." People rather than machines play the decisive role.

W. A. Cook's Electrostatics in Reprography, a lucid first survey of this important imaging technique, includes an excellent glossary of reprographic terms.
In a paper prepared for the Third International Congress on Reprography, William R. Hawken describes a hybrid technology—microphotography combined with integrated circuit photography—that has been used for some ultramicrofiche production.86 "Ultrafiche Technology," a comprehensive technical article by Klaus W. Otten, appeared in the March Journal of Micrographics.87 In the Penrose Annual, a well-illustrated presentation by E. B. Garsted introduces NCR's method of ultramicrophotography based on photochromic materials.88

The American Association of Junior Colleges has concluded a series of pilot studies as part of its research project on microform utilization and is ready to approach the question of "whether users of microform can learn as well from this means as from textbooks, journals, newspapers, etc."89 The Barrington School Project, having investigated the potential of microform use in elementary school instruction, will publish a full report and continue testing if funds are available. The University of South Africa has started an experiment worthy of attention. Students enrolled in the third-year course in librarianship will get some first-hand, in-depth experience with microform reading materials by using microfiche textbooks.90 It will be exciting to find out about reactions to this experiment.

In a program extending over the past three years, the Denver Research Institute explored microform applications in education. Some of their work was done under an OE research contract. This project has been concluded, and its final phase report is available.91 The study was set up to "provide first insights into questions of 'broad and routine use' of educational microforms in support of a 'content'-type course of instruction."92 It concluded that such use is possible, with qualifications. More specific questions were asked in studies made for the Air Force Human Resources Laboratory. One study found that substituting microfiche for conventionally presented text did not make any difference; the class which studied with microfiche did as well as the control group.93 In a visual skill test, no significant difference was found between microfiche and full-size print use as long as the test object was narrative. With nonnarratives, however, significant differences in student performance were documented. These studies replicated the results of earlier tests by T. S. Baldwin and L. J. Bailey.94, 95 In another report, James P. Kottenstette and associates point to the unique characteristics of the sheet film for branching and how these may be used to advantage by appropriate formatting.96 Studies of this kind are needed to help develop the full potential of microforms; their continuation should not depend on whether the proposed Organization for Microinformation at the University of Denver succeeds in its program to develop subscription funding.

The role of reprography and micrographics in libraries has increased steadily during the past decade. RLMS is responsible for keeping the library profession informed about the possibilities and problems of image transfer technologies and representing the best interests of li-
libraries and their clientele in this area. The section's annual report appears in the Fall issue of _LRTS_.

ALA sponsors the American National Standards Institute's Committee PH5, which is responsible for documentary reproduction including micrographics. A task group on 16mm microfilm containers has been established by the PH5.1 subcommittee. Hubbard W. Ballou, former secretary of PH5, explains in the July _Journal of Micrographics_ what standards are and how they are developed and adopted. The following comment made in 1959 might illustrate the need for patience with as well as continued concern for Committee PH5 by librarians: "The committee ought to discuss the problem of material which cannot be controlled as to quality before it is photographed . . . and extend the engineering drawing concept to cover other materials." Since most of the microforms used in libraries fall into this category, this is a matter of great practical consequence to libraries. It is still unsettled.

Early in 1971, NMA decided to issue "industry standards" and established its own Standards Board, with Donald M. Avedon as chairman. Proposed standards are published in the _Journal of Micrographics_ for comment and are adopted by letter ballot. "The efficacy of standards developed and issued by the NMA will depend to some degree on their acceptance by the micrographic manufacturing community, but to an even larger extent on the degree to which they truly meet user needs," comments the _Micrographic Weekly_. In 1971 three NMA standards were published: MS 1 and 2, both concerning computer-output microfilm, and MS 100, a glossary of micrographics. NMA has taken a strong stand in support of metrication efforts; Don M. Avedon's column on standards in the _Journal of Micrographics_ explains the rationale. At the well-attended NMA convention in Washington, D.C. Edwin C. Pomranka proposed a most comprehensive project: the micropublication of the entire collection of the Library of Congress. An NMA Archive of Micrographics was established, and executive secretary Vernon D. Tate was appointed archivist.

The education of library reprographers is a permanent concern. Few college courses are available. Besides those at the University of Maryland, and the Drexel Institute of Technology, and Hubbard W. Ballou's long-established class at Columbia University, short courses were held at the University of California at San Diego, San Diego Community College, and elsewhere. But Don W. Massey's "Microcopying Techniques" at the University of Virginia seems to have been the only new full-semester class. Vernon D. Tate's address at the First Annual Seminar of the Virginia Microfilm Association in Charlottesville, Virginia, "Concepts of Micrographics," eloquently set forth what must be demanded of those who want to help chart the course of micrographics. This was probably the most memorable lecture of the year.

• 150 •
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• 152 • _Library Resources & Technical Services_
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• 154 • Library Resources & Technical Services
THE CLOSE of the year brings an opportunity or an excuse to look back on achievements and disappointments and to think what might have been and what must be in the new year. Thus, "year's work" seems to connote events and ideas as evidenced in the literature, in news announcements, and at meetings. Though it is probably unsafe to try to characterize the events of a particular year as indicating a trend or a prominent concern, the temptation to do so for 1971 is strong. Practical application of established ideas seemed to overshadow any theoretical advances. In short, it was a year when the practicing cataloger received some much needed help and uses of recent technological advances were tested, but no new frontiers were broached.

Since the readers of this journal have had the opportunity to peruse its contents during the year, no attempt will be made to include articles from it in this review. Comments will be limited to articles and books published during 1971, although a few stragglers from 1970 will also be included. As this is necessarily a selective rather than a comprehensive review, there are some intentional and some accidental omissions. Those works which pertain to information science in its most technical manifestations and do not portend an immediate impact on cataloging will be excluded. For purposes of organization the review will be divided into the following general categories: catalogs and cataloging, nonbook materials, subject analysis, classification, and automation.

Catalogs and Cataloging

The major event of 1971 was undeniably the birth and funding of the Cataloging-in-Publication (CIP) program, which was heralded by Verner Clapp as "the greatest invention since the title page." At first that seems an extravagant thought, but the idea becomes more and more plausible as Clapp traces the way books have identified themselves, ingeniously called autobibliography, from the incipit to CIP. It will be interesting to watch CIP develop during the two years for which it has been funded to see whether the problems revealed by the
Cataloging-in-Source experiment have been solved, whether librarians and publishers give the new program the ongoing support necessary to permanent funding, the various ways in which CIP information is used, and the impact of the use of CIP on the management of cataloging operations. Another attempt at expediting cataloging is described in “A Canadian Program of Shared Cataloguing.” In this plan the six participating Canadian university libraries share the responsibility of cataloging works for which Library of Congress cataloging is not available. Each library is assigned responsibility for cataloging works falling into assigned letters of the alphabet. The cataloging is carried out immediately upon receipt of the work, and the copy is shared with the other members of the group. In addition to immediate benefits, the program is seen as insurance against any future curtailment of the National Program for Acquisitions and Cataloging (NPAC).

The final report of the Colorado Academic Libraries Book Processing Center Project covers the practical testing of the theories and principles developed in an earlier feasibility study. New problems were encountered, but the concept of centralized processing in Colorado proved economically sound and acceptable to participating libraries. They do not claim that their methodology is the best or only approach available, but the report is nonetheless an important source of information for anyone interested in the practical problems of centralized processing at the state level.

On the international scene, the establishment of a permanent cataloging secretariat under the sponsorship of the International Federation of Library Associations (IFLA) promises to promote international standardization of cataloging and bibliographic practices and to serve as an information agency on work in progress. Mrs. Dorothy Anderson is the first secretary of the organization, and members of a Steering Committee have also been named. Also of interest on the international level is the completion and anticipated publication of a document detailing the International Standard Bibliographic Description (ISBD). The usefulness of the standard, which covers bibliographic description, but not choice and form of entry, will of course be dependent upon the extent of its adoption. The dream of international standardization of entry remains a dream.

Revision of the Anglo-American Cataloging Rules (AACR) as evidenced in the annual report of the Cataloging and Classification Section (RTSD), and LC’s Cataloging Service has been largely along the lines of explanation and amplification. The latter publication has been particularly helpful to the practicing cataloger, but shows no indications of the structural overhaul so forcefully argued for by Seymour Lubetzky in his short but pungent article about “noxious compromises.” However, one bright note is LC’s announcement that it “has decided to abandon its long standing practice of cataloging all issues of serials under the latest title and name of corporate author and to follow the Anglo-American Cataloging Rules as printed.” The im-
petus for this decision may be traced to *Serials: A MARC Format*, in which the method of “including all information about the serial under the latest title and/or entry, with links from the earlier titles/entries to the latest,” was rejected in favor of following the Anglo-American method.\(^{11}\) It is interesting to recall early criticisms of the *AACR* for its lack of consideration of the contingencies of the computer. In the case of serials cataloging, the computer seems to have nudged the Library of Congress into a position of accepting another part of the rules. An informal poll of large research libraries conducted by the University of Utah shows that 62.5 percent of the twenty-nine responding libraries are either leaning toward or have decided to follow LC’s serials cataloging policy.\(^{12}\) As usual, we admire standardization from a distance, but do not always choose it when it is offered. Also in the area of serials cataloging is the very comprehensive paper by Kathryn Luther Henderson.\(^{13}\) She presents a detailed historical treatment and a thorough summary of the thorns in the thicket of serials cataloging, including examples of the various methods of handling changed titles. Those libraries which have decided not to follow LC’s change to the *AACR* in serials cataloging might do well to study Henderson’s comparison of methods.

The comprehension of catalog use provides a continuous challenge to catalogers and public service librarians. We are now fortunate to have the final report on the utilization of the card catalog in the main library of Yale University, *User Requirements in Identifying Desired Works in a Large Library.*\(^{14}\) Here the basic purpose was to determine from a study of catalog utilization the structure which would be most effective in a computerized catalog. It is also suggested that our knowledge of catalog use could be expanded if other libraries of various types and sizes would undertake similar studies. The findings of this report should be of interest to all librarians who make or use catalogs, and hopefully as an inspiration for further research. Arthur Maltby does not break any new ground in his “Measuring Catalogue Utility,” but adds persuasively to the case for catalog use studies and points up some of the problems involved in large-scale studies.\(^{15}\) On the side of work in progress, it is encouraging to see the reference librarians maintaining an interest in catalog use, as demonstrated by the activities of the Reference Service Division’s Catalog Use Study Committee.\(^{16}\)

A new collection of readings and information on book catalogs by Maurice Tauber and Hilda Feinberg includes articles published since the 1963 *Book Catalogs*, edited by Robert Kingery and Maurice Tauber.\(^{17}\) This new work is notable for its collection of sample pages from thirty-two book catalogs, which are accompanied by information on physical characteristics, method of production, frequency of issue, and production costs. The various options open to the Birmingham (England) University library in converting its card catalog to a book catalog are considered in an article by Thomas French.\(^{18}\) Though no conclusions are reached, the data assembled and the bibliography should

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*Volume 16, Number 2, Spring 1972*  

- 157 -
be helpful to others contemplating the same change. The catalog involved is a classified catalog, and the reason for the change is adoption in 1972 of a MARC-based cataloging system.

An interpretive work on the AACR has long been in need, and 1971 produced two. *Introduction to the Anglo-American Cataloguing Rules*, by P. K. Escreet is an English work which is essentially an exposition of the rules with background commentary. The author’s asides and comparison of the British and North American texts should be of value to serious students of the AACR. An American work, *How to Determine Author and Title Entries According to the AACR*, by Donald Lehnus is a rearranged and condensed statement of the rules with card examples. Since there is no title-page information to go with the card examples, the bibliographic conditions behind the cards are not known and the value outside Lehnus’ classroom is questionable. Some catalogers might also quibble with his arrangement and his interpretation of some rules. *Library Cataloging, A Guide for a Basic Course*, by John Immroth and Jay Daily might also be considered in the category of guides to the AACR, though, as indicated in the title, the work also covers classification and subject headings. This text might be helpful to a beginning cataloging teacher. A much more comprehensive text, excluding the mechanics of classification, is *Cataloging*, by John Horner. Although it is doubtful that this English work would be adopted as a text in the U.S.A., for some teachers it may come closer to being an acceptable text than anything yet published.

*English Language Books by Title: A Catalog of Library of Congress Printed Cards* is a new publication from Gale Research Company. The base set covers 1969 and 1970, and is to be updated by quarterly supplements and annual cumulations. It is interesting to speculate on how this publication will be used, particularly in view of the arrival of CIP, and how much more helpful it would have been to have a title index to all the works represented in the *National Union Catalog*.

**Nonbook Materials**

Publications of the past several years reveal the fact that media specialists have become increasingly aware of the need for bibliographic control over their nonbook materials. Furthermore, they are in the process of rejecting locally prepared cataloging manuals in favor of mutually acceptable national standards. Evidence of this trend may be seen in the Association for Educational Communications and Technology publication, *Standards for Cataloging Nonprint Materials*. This is a neat and professional treatment of the complexities of nonbook cataloging, which is lacking only in an awareness of the structural technicalities of producing an integrated catalog for an integrated collection. Hopefully, the next step will be a realization by the media specialists that they do not live on a desert island and must coordinate the cataloging of their special media with the cataloging of media in
book form. Committees which are cognizant of these problems are hard at work on revision of the Canadian Library Association's Non-Book Materials, which has been adopted in interim by ALA, and the rewriting of chapters 12 and 13 of the AACR. A scholarly and comprehensive treatment of the nature and utilization of nonbook materials as related to their bibliographic control is presented in the British publication, Non-Book Materials: Their Bibliographic Control. The basic idea is to produce a store of machine-readable bibliographic records for nonbook materials, utilizing the MARC format. It is particularly heartening to note the concern shown for integrated catalogs, and the announcement of the formation of a special committee of experts charged with the mission of scrutinizing existing codes and producing "a comprehensive draft of rules for the cataloguing of all significant media, other than books and book-like materials." The British findings on the cataloging of nonbook materials will certainly merit our continued attention.

Also in the area of cataloging nonbook materials are the MARC formats for films and maps. The former will be used for the production of Library of Congress Catalog: Motion Pictures and Filmstrips as well as for production of catalog cards. If a market is found to exist, the records will be made available from the MARC Distribution Service on a separate subscription. "Machine-Readable Map Cataloging in the Library of Congress" presents the historical background of map cataloging at LC, traces the development of computerized map cataloging procedures, and considers the utilization of MARC map data at LC and in other libraries.

On the fringe of nonbook materials (if a book in nonbook form can be called a nonbook) is a study on the problem of bibliographic control of the avalanche of microforms. Felix Reichmann and Josephine Tharpe set out to find "an effective system of bibliographic control of microforms" and finished by presenting an "investigation and delineation of the problem, followed by recommendations for action." Though this is an interim report and does not solve any problems, it deserves the attention of all librarians who are burdened with the microform problem and particularly those who stash the unmanageable things away in cold storage. The authors' findings of apathetic and defeatist attitudes toward the problem are not reassuring. Allen Veaner also considers bibliographic control and other related problems in his state-of-the-art review, "Micropublication." His observations that "the micropublishing industry has a responsibility to provide adequate bibliographic control and retrieval tools for the user," and that the publisher should "consult beforehand with those who are knowledgeable about user habits and the methods of bibliographic access—librarians and scholars," are particularly significant. The idea of bibliographic control "before the fact" also has implications for book and other nonbook publishing, and could help to simplify cataloging and lower costs.

*Volume 16, Number 2, Spring 1972*
Two doctoral dissertations on two aspects of subject analysis have been published and will, as a result, be available to a wider audience. In a study by Jessica L. Harris the development of subject headings is reviewed and the use of computer techniques for analysis of subject heading structure is demonstrated. The importance of a formal subject headings code is noted, and the LC subject headings are found to be an example of informal faceted classification. In his dissertation John Immroth investigates the problem of coordinating the vocabularies of the LC subject heading list with the indexes to the LC classification scheme. "This study investigates descriptively first, the relationship between the classification schedules and their indexes and second, the relationship between subject headings and classification headings. The third phase of this study develops an experimental model of a chain index which may serve as both an index to the classification and a list of subject headings." An Introduction to Chain Indexing is a programmed text which should be helpful in teaching, and might also aid in comprehending the ideas presented by the authors noted above. For those who haven't had the time or diligence to study the full report on the BNB's PRECIS (Preserved Context Index System), Derek Austin has provided a concise introductory article, "PRECIS Indexing." Once having had a glimpse of this computer-based subject indexing system and Austin's excellent explanation of it, one might feel encouraged to tackle the full treatment.

Gale Research Company, which has gone into the cumulation business in such a big way, might add further to its accomplishments by publishing a perpetually cumulating edition of the LC subject headings list. Unless a computer-produced listing is utilized, the supplements which must be consulted now number seven, with no signs of a new edition from the Library of Congress. Lacking standardization and consistency in our subject headings, it would be of some consolation to be able to use the headings presently available with greater ease. Such a cumulation would also be useful as an adjunct to those catalogs which do not include subject references or those which are presently served by the seventh edition of the LC list minus the supplements.

Classification

1971 was the year of expectation as we looked toward Dewey 18. As of the end of the year we are still looking and having to be satisfied with a review of the "highlights" and David Batty's programmed text. The latter is very similar to his text for Dewey 17, with appropriate modifications, but the errors go beyond those included in the corrigenda and show the folly of being in such a hurry to produce a programmed text. As to the changes in DDC, they look to be
very much on the plus side, but the use of the standard subdivision -04 for "general special" should provoke some interesting reactions.

Concern over inconsistency in application of the DDC by the British National Bibliography and the Decimal Classification Division of the Library of Congress is expressed in an article by Joyce E. Bruin. As with so many other problem areas in librarianship, the solution lies in standardization of application; but, achieving standardization in this area which depends on the interpretation of the individual classifier will not be easy.

The Library of Congress Classification continues to receive considerable attention in the literature as more and more librarians become involved with it. Adopting the Library of Congress Classification represents an attempt to ease the burden of those making the change by anticipating and solving some of the inevitable problems. Persons who have been through the adopting and reclassifying process may question some of the rationale and methods suggested, which are based on the authors' experience at the University of Puget Sound. A large portion of the book is devoted to explanation of Class P tables, with emphasis on tables VIIIa and IXa. This will undoubtedly be helpful to the beginner but is only a fraction of the information on LC tables which might have been offered. Anyone still interested in the pros and cons of the LC classification might benefit from reading the literature survey and discussion in Kjeld Birket-Smith's Local Applicability of the Library of Congress Classification; A Survey with Special Reference to Non-Anglo American Libraries. The conclusion, not surprisingly, is negative.

The second edition of Immroth's A Guide to the Library of Congress Classification is in an improved format, but the content seems largely unchanged except for updated bibliographies and minor rearrangements. Another major cumulation from Gale Research Company is the Library of Congress Classification Schedules: A Cumulation of Additions and Changes Through 1970. The excellent format and planned continuous cumulation service for this work should guarantee more up-to-date classification numbers in our libraries and sweeter-tempered catalogers.

Automation

The devil's advocate, in the personage of Ellsworth Mason, came forth in 1971 to question the computer. While cataloging is not singled out as the particular focus of his discussion, the implications are loud and clear. If we do not allow ourselves to be put off by the lurid treatment, the article should stimulate some needed evaluation of goals, means, and results. Even when we're using a Cadillac, not a Boeing 747, to deliver a bonbon across town, something is out of proportion.

On a more serious level is the collection of papers on MARC utilization presented at the 1970 Clinic on Library Applications of Data Proc-
The intention was to review MARC after one year of operation, to present the current picture and future programs of the Library of Congress in regard to MARC and to assess the local, national and international potential of this service. The papers, all by well-qualified experts, are an important contribution to the data on MARC, the success of which is dependent on continuous reporting of implementation. We are fortunate that the pioneers take the time and trouble to report on their experiences. U.K. MARC Project also presents a group of sound papers, obviously with a British slant.

As always, the *Journal of Library Automation* is a valuable source on automation as it relates to cataloging. Here we can find the latest information on the RECON Pilot Project, and a discussion of MARC file size and possible means of size control. Also of interest are the articles on MONOCLE, a processing format based on MARC II and designed to encompass French cataloging practice, and “Shawnee Mission’s On-Line Cataloging System.” The latter describes the specifications of a successful on-line cataloging pilot project. Another report on automation, which is a couple of light-years away from Shawnee Mission in scope and sophistication, records the results of Phase I of Stanford University’s Project BALLOTS (Bibliographic Automation of Large Library Operations Using a Time-Sharing System). The preliminary report on Loughborough University of Technology’s MINICS (Minimal-Input-Cataloguing System) was published in 1970. This system was originally designed as a simplified means of cataloging reports and papers, but is now regarded as applicable to all types of materials. The minimal level is indicated by the fact that there are forty-eight data fields allowed to cover basic cataloging information, which is about one-fifth of the MARC field and subfield capacity. Any attempt to simplify or minimize our bibliographic dilemmas deserve interest and encouragement.

**Conclusion**

We peeled a few layers off the cataloging problem in 1971, but there is still much work to be done in the areas of standardization, centralization, communication, and simplification, as well as utilization of technological advances. With the stimulus provided by the practical developments of 1971, the future should test our abilities to utilize these advances and to integrate them with existing and emerging technological capabilities.

**REFERENCES**


*Volume 16, Number 2, Spring 1972*


IN 1971 the technical press as well as publishers intending reading material for a general audience produced an impressive number of contributions of serials interest. The range extends from the LARC Association's *A Survey of Automated Activities in the Libraries of the United States*, which reports 217 libraries claiming "automation projects: serials and periodicals applications," to a March 26, 1971, piece in the *Los Angeles Free Press* on "How to Stock a Radical Library" to a July 2, 1971, *Houston Chronicle* article "Big Magazines 'Think Small,'" on the trend to pocket-size format for large circulation magazines.\(^1,2,3\)

James Ridgeway was the author of "The New Journalism" in *American Libraries*, which has a bibliography of "topical publications" appended.\(^4\) The underground press in Canada received notice in Bill Katz's continuing column "Magazines" in *Library Journal*.\(^5\)

**Recording and Cataloging**

Many libraries following Library of Congress practice welcomed the Processing Department's *Memorandum* of May 31, 1971. As of that date, LC began use of the Anglo-American Cataloging Rules for the cataloging of serials. Specific routines for implementation of this decision are outlined in the memorandum. Procedures for handling analyzable monographic series other than those that are documents, technical reports, reprints from journals or those requiring page analysis were described in the next Processing Department *Memorandum* issued June 14, 1971.

Serials were given space in "Priority 2" in a listing noted in *Cataloging Service Bulletin* 100 of the Library of Congress Processing Department issued June 1971. It is encouraging to note the inclusion here of government publications. "The principal effects of the new revision of LC priorities will be seen in the faster cataloging of American monographs, serials, and documents, as well as in the cataloging of live serials in general."

The editing of serial information for conversion to machine-readable form received continuing attention at the Library of Congress. Experimentation is reported in the *Semiannual Report on Developments at the Library of Congress. Addendum no. 1 to Serials: a MARC Format*

Provision of a standard identification for serials published worldwide is the goal of International Standard Serial Numbering. Implementation of ISSN, approved by the American National Standards Institute (ANSI) and the International Standards Organization (ISO), has begun:

The R. R. Bowker Company's Current Serials Bibliography Department, headed by Emery Koltay who is also the Director of Standard Book Numbering Agency, has begun work on assigning ISSN's to the Bowker data base of some 70,000 international serials. Because of its comprehensiveness, the data base was selected as the starting point for the ISSN system by delegates to the ISO plenary meeting in Lisbon last May.


The numbering is being carried out at Bowker in collaboration with the American National Standard Institute Z39 Committee on Library Work, Documentation, and Related Publishing Practices; a representative from a committee of leading serials subscription agencies; and the Library of Congress.

While International Standard Book Numbering is decentralized, a centralized system for serials numbering is required because of the large number of serials publishers throughout the world. Some 45,000 publishers are represented by the 70,000 publications now being numbered at Bowker.

Every effort is being made to include all serials subscribed to by major libraries and currently being abstracted and indexed. At the request of libraries, subscription agencies, abstracting and indexing services, and others using the ISSN system, Bowker will assign numbers to titles not represented in its database. Listings of newly assigned ISSN's will be published periodically.

Upon the March publication of the ISSN index as part of *Irregular Serials and Annuals*, the ISSN for each publication will be sent to the publisher with the request that the number be printed on the cover of each issue.

*United States Book Exchange*

The USBE, a nonprofit cooperative agency sponsored by twenty-one library and scholarly organizations, was strengthened in 1971 by a grant of $48,450 from the Council on Library Resources for employment of additional personnel. Monthly lists of some of the periodical titles available are issued. Members may send in their own periodical want lists in whatever format is easiest and most economical for the library to prepare. The books and journals are open for personal selection. Contact Ms. Alice D. Ball, USBE, 3335 V Street N.E., Washington, D.C. 20018 for additional information.

*Library Resources & Technical Services*
Union Lists

Numerous union lists of serials appeared in 1971. Of note are these: *Union List of Serials in the Libraries in the Miami Valley*, 3d ed.; the Stanford University *Union List of Serials: Science and Technology* (completely revised and updated); and a *Union List of Serials* containing the holdings of three special and nineteen academic libraries in south central New York State, issued by the South Central Research Library Council. Wilson Library Bulletin reports that "lists of periodical holdings were exchanged by fourteen out of twenty-one community colleges in Maryland." In June 1971 the Montana State Library issued a *Union List of Serials Indexed in Abridged Index Medicus*; 1970 holdings of twelve Montana academic, clinic, hospital, and special libraries are included indicating the location of ninety-four titles. A product of Lehigh University Library's computerized serials record project is *A Union List of Current Periodical Subscriptions* (published by the six academic libraries affiliated with the Lehigh Valley Association of Independent Colleges consortium). Future additions will be LVAIC noncurrent serials holdings and continuations.

General Serials Matters

The Pulps, subtitled "50 years of American pop culture," edited by Tony Goodstone, surveys the sensational literature which appeared as often as "twice a month" between 1896 and 1953. Also in the historic vein, *Scribner's Monthly 1871* was issued in celebration of Scribner's 125th year. Reproduced are all issues of the magazine for that year.

For a contemporary mood look at Bill Katz's *Magazine Selection: How to Build a Community-Oriented Collection*, issued by R. R. Bowker. "A survey of over 100 public libraries of varying size revealed that 92% subscribed to the *Ladies' Home Journal*, while only 9% received *Playboy* and 6% *Rolling Stone*. Approximately 65% of the librarians answering the survey questionnaire noted that their principle selection standard for magazines was whether or not it was indexed; only 23% stated that their first consideration was what had been requested by their patrons."

The *Black Press, U.S.A.* by Roland E. Wolseley is a "detailed and understanding report on what the Black press is and how it came to be." The Iowa State University Press is the publisher.

Periodical Resources

*Periodical Literature on the American Revolution: Historical Research and Changing Interpretations, 1895-1970*, a Selective Bibliography, compiled by Ronald M. Gephart, is a representative guide to Revolutionary era periodical literature. George III and George Washington decorate the cover of this ninety-four-page Superintendent of Documents publication ($1.00 a copy).

Eric Publishing is offering the *Eric 70 Year Cumulated Index to Volume 16, Number 2, Spring 1972*
Popular Periodicals—periodicals indexed and entries are the same as those in the H. W. Wilson Co.’s Readers Guide, but cumulated in one series of alphabetic volumes.

Specialized indexes to periodical literature appearing in 1971 include these: Africa South of the Sahara, Index to Periodical Literature 1900-1970 (G. K. Hall); Sources for the History of Irish Civilization, articles in Irish periodicals (G. K. Hall); and The Index to Periodical Articles by and About Negroes, Cumulated 1960-1970 (G. K. Hall, compiled by the staffs of the Hallie Q. Brown Memorial Library, Central State University, Wilberforce, Ohio, and the Schomburg Collection of Negro Literature and History, New York Public Library).


January 1971 was the scheduled date of appearance for a weekly publication of the Department of Trade and Industry Central Library in London entitled Contents of Recent Economics Journals, which consists of facsimiles of tables of contents from the issues of the selected periodicals received during the week.

Specifically for Librarians

Library Serials Control Systems: a Literature Review and Bibliography (as of December 1970) reviews the literature on automated serials control systems and draws conclusions on the issues of user studies, technological developments, emerging national standards, and costs. One hundred fifty-eight documents make up the selected bibliography.

Volume two (1971) of Advances in Librarianship should be noted by those concerned with “the computer in serials processing and control.” Don L. Bosseau contributed this section which covers serials systems in concept and in operation with an “evaluation and prognostication.”

LIST 1971 (Library and Information Science Today) is the first in a planned annual series. The directory will identify the innovative work underway in the field.

ALA Studies in Librarianship began in 1971. The first number by John Rowell and M. Ann Heidbreder is entitled Educational Media Selection Centers; number two, Services of Secondary School Media Centers, lists Mary V. Gaver as author.

Foreign Serial Literature

In February 1971 the American Library Association issued Serial Publications in the British Parliamentary Papers, 1900-1968: a Bibliography by Frank Rodgers. The stated purpose is “to list by issuing agency all serials which have appeared in the House of Commons Sessional Papers at any time during the present century and to indicate briefly their publishing history.”
British Official Publications by John E. Pemberton is an introduction to British Government publications, parliamentary and nonparliamentary, current and noncurrent.


In other areas of the world, these should be noted: French Language Periodicals Bibliography issued by the Manitoba Association of School Librarians (alphabetical title listing with annotations and acquisition information indicated) and the annual Le Catalogue de l'Édition Française ("French Books In Print") intended as "the most complete and accurate guide to available French-language books" (mentioned here as a welcome addition to the "annualls" field).16

Part II of Half a Century of Russian Serials, 1917-1968: Cumulative Index of Serials Published Outside the USSR, compiled by Michael Schatoff, was issued by the Russian Book Chamber Abroad in 1971.16

Volume four of Latin American Serial Documents: a Holding List on Mexico appeared in June; other countries will be covered in this continuing project.17

September saw the publication of the 14th edition of Ulrich's International Periodicals Directory, Volumes I and II (as previously mentioned). A Bowker release states that "since 1969, 11,000 new periodicals have appeared on the world market. These as well as 40,000 other titles are indexed and cross-indexed by subject headings in the 14th edition of Ulrich's." A supplement is expected in 1972.

New Titles

Considerable "flavor" is given to serials acquisitions with the appearance of new titles, it would certainly be agreed. Nostalgia received its due with the arrival of Liberty (Summer 1971, reprints of material previously printed in Liberty complete with reading time indicated).

Of "professional interest" to librarians should be: Protean; Administration, Systems, Management in Libraries (Ohio State University Libraries); The Crab (formerly Maryland Libraries, Maryland Library Association); School Library Newsletter (a monthly checklist of new sources of free materials and bibliographies for elementary and junior high school librarians, Libraries Unlimited); and Microform Review (articles on micropublication and reviews of current microform publications). A special introductory edition of Books in Canada (Canadian Review of Books Ltd.) appeared May 1971; eighteen issues per year are following.

To those searching for newer periodicals of a sociological nature, The Yale Review of Law and Social Action will be of interest.18 Started with a grant from the Yale Law School, it is now financed entirely by subscriptions. Time reported the publication of The Exceptional
Parent in June 1971. Aztlan, a “chicano journal of the social sciences and the arts,” can be ordered from the Mexican American Cultural Center, University of California at Los Angeles. The Journal of Applied Social Psychology began quarterly publication with the January/March 1971 issue.

Natural Life Styles, “an organic guide for living,” appeared with an initial printing of 40,000, priced at $1.00. A more formal publication is Environment Information Access (v.1, no.1, Jan. 29, 1971).

In a potpourri category are these, each appearing first in 1971: The Film Journal, Synhetic Communications, Journal of College Science Teaching and k-8ight: Learning Through Media (a new media magazine for elementary school professionals).

Reprints

Reissues of periodicals continued to find a ready market. World Wars I and II were covered by Arno Press full-sized facsimiles of The Stars and Stripes and Yank, The Army Weekly. Along literary lines, one may now purchase a reproduction of The Germ, a Pre-Raphaelite little magazine to which the Rossetti's contributed about half of the contents. A project “aimed at making available on microfilm a broad ganged selection of British 18th and 19th century periodicals” is described by Daniel Fader in Library Journal, April 15, 1971. The list of periodicals to be microfilmed is entitled British Periodicals on General Subjects and contains 131 titles, representing approximately three million pages of magazines which began publication during these centuries, The Germ included.


Time Marches On

The success of two revivals deserves comment. The Saturday Evening Post and Liberty were again available on most newsstands. Each will follow a quarterly publication schedule. The Post “will be sold only on newsstands; the new postal-rate increases . . . make subscriptions too expensive to service.”

Intermagazine competition and details of production led several magazines during the year to change their page size. This is explored in a Saturday Review article by John Tebbel who discusses differing circumstances, title by title.
Many library patrons noticed the demise of I. F. Stone’s Washington Newsletter, the death of Look (a Saturday Review editorial on this was reprinted in the following week’s issue of U.S. News & World Report as an editorial comment on conditions in the publishing industry), and the discontinuance of THINK by IBM with the November-December 1970 issue.23,24

Economics

Price Indexes for 1971: U.S. Periodicals and Serial Services by Helen W. Tuttle, William H. Huff, and Norman B. Brown appearing in the July 1971 Library Journal states: “This year’s figures show that the upward trend of prices continues to accelerate, providing additional concern for librarians faced with tightening budgets. In 1961, the U.S. periodical index (based on the 1947-1949 average) was 155.5; in 1971, based on the 1957-59 average, it was 237.0, a measure of the dramatic acceleration of price increases during the intervening decade. In 1969, the average subscription price for all the periodicals used to produce the index was $9.31; in 1970, $10.41; and in 1971, $11.66. . . . Serial services exhibited the same trend. In 1961, the index had risen an average of 3.4 points per year over the base period, and in 1971, an average of 8.1. The base average for 1957-59 was $39.80 and it increased $4.08 to $43.88 for the 1961 average. The base average for 1967-69 was $72.42, which increased $17.63 to $90.05 for 1971.”

Association Activities

American Library Association Serial Section activities were reported in the 1971 issues of LRRTS. The discussion groups continue to provide an informal forum for the consideration of common problems. A joint meeting of the RTSD Acquisitions and Serials Sections was held during the June 1971 Dallas conference.

In Summary

Whichever references one chooses to follow from this collection of “year’s work in serials,” let me add a recommendation for the Wilson Library Bulletin “Information Exchange” column written by Donald J. Coombs which includes most practical indications of the real world of serials departments, all in good humor.25 You’ll enjoy it. All of the situations mentioned will probably extend well into the work of 1972.

REFERENCES

8. Stanford University Union List of Serials: Science and Technology can be obtained from the Financial Office, Stanford Libraries, Stanford, CA 94305, at a cost of $15.00 postpaid.
9. Available from the South Central Research Library Council, 331 Sheldon Ct., College Ave., Ithaca, NY 14850, for $15.00.
14. Available from ERIC Clearinghouse on Library and Information Sciences, ED 044 588; MF $0.65, HC $3.29.
15. Order from Manitoba Association of School Librarians, c/o Special Area Groups Secretary, The Manitoba Teachers' Society, 191 Harcourt St., Winnipeg 12, MB, Canada.
16. Russian Book Chamber Abroad, P.O. Box 126, Cathedral Station, New York, NY.

• 172 • Library Resources & Technical Services
Acquisitions in 1971

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and
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TO ACQUISITIONS LIBRARIANS and book dealers 1971 will be remembered as the year of the budget cut. The recession and decreased funding had an adverse effect on libraries of all types. With municipal and state support cut back, libraries were forced to cut back on hours, personnel, and book funds. Since it is probably easier and quicker to reduce book funds than personnel, the initial impact was probably felt most by acquisitions departments. Less book money meant fewer searches and fewer orders to be typed. Instead of backlogs in cataloging and other processing areas, libraries were now faced with personnel “frontlogs.” If fund cuts are only temporary, the problem can be handled by temporarily shifting people from ordering to reading shelves, or from searching to checking in serials, or from checking incoming book shipments to repairing worn books. If, however, the cuts are permanent, then acquisitions librarians must take a hard look at the whole sequence of functions and procedures in this area. The same is true, of course, throughout the whole library. Perhaps, over the past decade we have become “fat cats,” used to extravagant living; many will, of course, dispute this, but it can’t be denied that sloppy techniques have appeared in many acquisitions departments. Perhaps this reduction of funds, if it doesn’t get out of hand, will have the salutary effect of prompting more efficient and logical selection and order procedures.

One of the first reports of a major slash in book funds appeared in January in Library Journal. The book budget of the California State College-L.A. library was cut by 25 percent, the result of a $3,000,000 cut in library funds, representing one-fourth of the total $12,000,000 cut in funds for the college. This harbinger of bad times was followed by a statement by Mrs. Lillian Bradshaw, ALA president, when she “issued a public protest against what will be the third year in a row of cuts in federal funding of library programs—if the Nixon budget figures are to be the last word on appropriations for fiscal 1972.” She indicated that library funding in the 1972 budget was 25 percent lower than that for 1971. She further pointed out that even in two comparatively untouched areas—federal funds for school library resources and for med-
ical libraries—inf{}ation would reduce the purchasing power of these funds below the previous year's levels, with Library Services Con{}struction Act Funds cut by 40 percent. "It is discouraging to note," added Mrs. Bradshaw, "that the Office of Management and Budget is apparently unaware of the vital role that libraries play in providing information services to the general public, to school and college stu{}dents and to all segments of our population." For the rest of the year the literature was replete with notices of cuts in funds throughout the nation affecting all types of libraries, and it is quite likely things will get worse before they get better.

**Federal Funds**

Congress approved a $5.1 billion appropriation for the Office of Education (USOE) with the passage of HR 7016 (PL 92-48). Book and library programs for the fiscal year beginning July 1, 1971, were continued at the same or slightly higher levels. HR 7016 provides the following amounts for programs related to library resources. ESEA Title II, School Library Resources, Textbooks and Other Instructional Materials, $90,000,000; HEA Title II-B, College Library Resources, $11,000,000.\(^3\)

PL 480 was allotted $2,891,000 of the Library of Congress Budget for the acquisition of new materials; LC also hopes to appoint a field di{}rector for Morocco and Tunisia.\(^4\)

Senate bill S 659 as passed by the House on November 4, extends the Higher Education Act through 1976. Title 2, which provides for federal aid to colleges and universities for the acquisition of library resources, library research and the training of librarians, authorized increases in fund levels for research from $5 million in fiscal 1972 to $40 million in fiscal 1976. Student work-study programs and aid programs for the construction of academic facilities were also extended.\(^5\)

**Tax Amendment to Restore Charitable Deductions**

Changes made by the Tax Reform Act of 1969 have resulted in discrimi{}nation against the creators of letters, memoranda, and similar property, in that it was formerly given capital gains treatment and is now considered as ordinary income property. Moreover, as charged in the "Resolution Restoring Charitable Deduction to Creative Artists and Authors," introduced at Dallas by ALA, the ultimate victims of this inequity have been major libraries in the country, including LC, since these restrictions do not apply to collectors, inheritors, and in some cases, dealers.\(^6\)

Senate bill S 1212 introduced by Frank Church (D.—Idaho) would allow the donor of the income property to deduct market value of the property minus 50 percent of the gain. HR 9103 by Ogden Reid (R.—N.Y.) would restore the full charitable deduction. Another bill which speaks to the problem is sponsored by Rep. Wilbur Mills (D.—Ark.). His HR 9505 deals with "the income tax treatment of charitable

• 174 •

*Library Resources & Technical Services*
contributions of copyrights, artistic compositions, or a collection of papers.” Though we could find no record of any action on any of the three bills this year, it appears that something will be done to resolve the problem.⁷

Reprints

Reprint publication flourishes in spite of library budget cuts. With less money to spend, acquisitions librarians will be forced to be more selective than in recent years, and with more titles available as reprints selection should be easier. The end result may well be better overall quality of materials acquired.

Book Production

The American book title output, both for new books and new editions, January-September 1971, showed an increase over the same period for the prior year. With new book production at 18,927 titles and new editions at 9,567 the total of 28,494 titles was 16 percent greater than in the corresponding period in 1970.⁸

The Statistics Committee of the Association of American Publishers in a survey of members determined that members consider statistical information to be one of AAP’s most vital services. Among the improvements that they would like (which all librarians will applaud) are better definitions and more categories conforming to LC classifications.⁹

Serial Price Index

Serial and serial services prices continue to rise, with the average serial price reaching $11.66 for 1971 and the average serial services price, $90.05.¹⁰

Government Micropublishing

The Public Printer, A. N. Spence, announced the Government Printing Office’s entry into the micropublishing field in February. He reported that national depository libraries want the GPO to publish in microfilm format, and he indicated that “a proposed GPO standard microform format with a reduction of 48x would permit most government documents to be reformatted economically from ink print publications to microform.”¹¹ The Information Industry Association, of course, issued a statement opposing GPO’s plans, claiming that the GPO would be in competition with the commercial firms which had made the initial investment permitting later microform publication.

Significant Publications

Of great interest is the plan of the Superintendent of Documents to prepare a single comprehensive catalog of all government publications available for sale. This should prove a boon in identification of those often elusive government publications.

A significant event occurred early in 1971 when the University of Toronto Press began the publication of new books simultaneously in conventional book form and in microfiche. In an era of sparse financial support for libraries, this may well become standard procedure as space decreases and postage rates increase.

For acquisitions librarians, the publication of Daniel Melcher's book *Melcher on Acquisition* was certainly significant. It covers all important aspects of the acquisition process and, coming from a veteran of the library-oriented book-publishing world, it has much solid information. It should prove particularly useful for library schools as well as for new librarians.

**ISSNs**

More numbers coming up. Bowker is to assign International Standard Serial Numbers for the 70,000 titles included in *Ulrichs*. The project, approved by both the American Standards Institute and the International Standards Organization, will result in the listing of ISSNs in the cumulative index of *Ulrichs* Volume III. "At the request of libraries, subscription agencies, abstracting and indexing services and others, Bowker will assign numbers to titles not in its data base. Listings of newly-assigned ISSNs will be published periodically."\(^{12}\)

Evidently the ISSNs will raise the price of Volume III. It is advertised, unpriced, in the *Library Journal* of December 1, 1971. We are sure that ISSNs will prove worth the effort and cost, although ISBNs don't seem to have become commonly used yet. In a summary of librarians' comments on publishers' catalogs and how they are used in libraries, the following statement appears in parentheses: "Several librarians admitted ignorance about ISBNs and needed to know why they are useful."\(^{13}\) The article lists some of the major points which emerged during a preconference on the use of publishers catalogs that preceded the New England Library Association's annual meeting in October.

**Copyright**

During June the Association of American Publishers held a two-day seminar to examine all aspects of copyright. Barbara Ringer of the Copyright Office reported that the issue of cable television was still the major reason that the copyright problem could not be solved. She warned that, "If the 1909 law remains in effect indefinitely, technological developments will simply engulf copyright protection and Congress will be powerless to do anything about it."\(^{14}\)

Copyright extension will be provided until December 31, 1972, as a result of action on SJ Resolution 123, which was cleared by Congress.
on November 15 even though the House had earlier vowed not to sponsor a third extension. Emanuel Celler (D.-N.Y.) chairman of the House Judiciary Committee, said on that day that the impasse over cable television seemed about to be broken, thus clearing the way for a revised copyright law.  

Postal Rates

The fourth-class special postal rates which apply to books were increased in May. Though both the American Library Association and the Association of American Publishers are making valiant attempts to stave off increases, libraries can expect a continued rise in these special rates, as the U.S. Postal Service attempts to carry out its mandate to become independent of government subsidy.

In Summary

Acquisitions articles, other than notices of fund cuts, were in short supply in the 1971 library journal literature. Perhaps this deficiency was compensated for by the release during the year of Daniel Melcher’s book. There was, however, a good deal of discussion on cooperatives for resource sharing in the literature this year. As more cooperatives develop, questions are sure to be raised about shared acquisitions programs. Perhaps we will see some emphasis on shared acquisitions in the literature in 1972.

REFERENCES

3. ALA Washington Newsletter 23 (1 July 1971).
7. ALA Washington Newsletter 23 (1 July 1971).
Africa in the Standard Classification Schemes

The Standard Classification Schemes surveyed are (1) Dewey Decimal Classification (DC); (2) the Library of Congress Classification (LC); and (3) the Bibliographic Classification of Henry Bliss (BC). It is realized that these classification schemes were developed at a time when research on Africana was in its infancy. That explains the very little provision made for Africana in them, and consequently, the problems now facing African librarians and others engaged in classifying Africana materials. It is suggested that certain classes in the schemes, e.g., classes FA-FZ (LC), 970-989 (DC), and N (BC) be used to develop the classification of African history.

Looking at provisions for the classification of Africana in the different classification schemes it is difficult, however broadminded a person is, not to criticize. In this paper it is not the intention merely to criticize as much as to point out the shortcomings in the provisions. In pointing out the shortcomings we are conscious of the fact that the Dewey Decimal Classification (DC) was developed in the nineteenth century, the Bliss Bibliographic Classification (BC) and most of the Library of Congress Classification (LC) in the first half of this century. We are also aware that makers of these schemes had little information on Africa with which to work. In a paper read at a meeting of African Society 1 May 1923, Professor A. P. Newton called Africa "the so-called 'continent'" and said that "the Africa that lies beyond the Tropic of Cancer has a story that begins only with modern times . . ." and that the subject of his paper was "... to show something of the unity which makes a history of modern Africa an integral part of a wider story, that of the expansion of European people. ..." A. P. Newton was a professor of Imperial History and makers of the general schemes should be pardoned if they assumed that such an idea of African history as his was the most authoritative.

Since A. P. Newton pontificated, over forty years ago, much intensive research has been conducted in African studies. Consequently, the world has more knowledge of Africana, and classifiers are in a su-
premely better position to recast the provisions for the classification of Africana so as to conform with the modern views of African historiography, etc. As Bliss said, “Classification schemes should be made in such a way that the order of the classes conforms or is determined by its use by, and its usefulness to, the thinkers and workers of the different branches of knowledge.”

We do not agree with the statement made by the Resources and Technical Services Division Classification Committee that “the consensus in the literature is that Cataloguers should accept the Library of Congress classification choices in preference to making local changes,” in view of the fact that Africana is so poorly provided for in the standard schemes. Wholesale relocation of classes and numbers are suggested below, because, as Krishnaswami asked, “How would it benefit a library in a non-Christian, non-English speaking and non-American country to use Dewey as it is without any modifications?”

Archaeology

It is not the intention here to deal in great detail with African archaeology. This is so because modern archaeological studies in Africa started only after the Second World War. Only North Africa, South and East Africa, and the Nile valley have been covered in any detail by archaeologists. Archaeological studies of the whole of West and Central Africa are still in their infancy. Even the coverage for the areas mentioned above has been sketchy, especially when it is remembered that (1) Libby developed a radio carbon (C14) method on absolute dating in 1950; (2) Midden analysis was evolved by Heizer in 1960 and potassium argon (K/A) method was developed by Evernden and Curtis only in 1961. An indication of things to come is a recent publication by Thurstan Shaw reporting sophisticated bronze objects dated 850 A.D. and showing a society with an organized system of government and which had developed a form of divine kingship, based on an economy, dependent partly on commerce with the outside world. And this was in an area where the soil had hitherto been held to be so acidic that it could not retain archaeological remains of great antiquity.

History

When we look at the provisions for African history in the general schemes we are conscious of the fact that, as far as professional historians were concerned, what happened in precolonial Africa was of minor consequence. And even within the colonial period itself, what counted was not what Africans were doing or had inherited from the past, but what Europeans were doing and what they had brought to Africa. Historians wrote in a vein similar to Sulpicius Severus (365–425 A.D.) and the Spanish priest, Paul Orosius (417 A.D.) who, when writing their universal histories, sought to find in them only a proof and justification of the Christian faith. And so the units of African history became, not of its own peoples and culture, but, first the spheres of in-
fluence and then the colonies and empires established by Europeans in Africa. The subject of study therefore was not the Ndongo kingdom of Ngola but the Portuguese in Angola.

BC allocates more than double the numbers to U.S. (NE-NR) than the whole of Africa (OS-OX). LC allocates the same numbers for the whole of Africa (DT) as for Greece (DF). DC felt that the numbers allocated to Africa were already too many and had to add South Indian Ocean Islands (969). Taking a single region, West Africa, we find that DC has the equivalent number allocated to it (966) as to France (944). BC has the same number for it (OX) as for New England (NJ), and that LC, which includes under this region Congo and Angola, has more than three times the numbers allocated to Italy (DG 1-999) as to the region (DT471-720).

Under Africa itself there is no proportionate allocation of numbers. DC has equal numbers allocated to Ethiopia (963), Algeria (965), and the whole of West Africa (966). The numbers allocated to Egypt and Sudan are nearly half of those to West Africa: Senegal to Angola. LC allocates almost equal numbers to South Africa as to the whole of West Africa. This is understandable since interest in African territories tended to be proportional to the extent of European influence and control. Notice that in the Cambridge History of the British Empire (1929/1959, 8v.), the history of white settlement in South Africa received a volume, while the rest of British Africa were dealt with through occasional chapters in the first three volumes. In the same region, e.g., West Africa, we find that in BC, Ghana and Bamako are given one number each (OXJ, OXU); in LC, Nigeria and Lagos have one number each (DT513 and DT515).

Appendix I shows the haphazard way in which African history has been classified. Each scheme recognized that there were regions such as North, West, Central, East, and South Africa. What countries comprised each region was another matter. For DC and BC West Africa stretches from Mauritania to Nigeria. LC's West Africa extends from Mauritania to South West Africa—after all, all these countries were on the western side of the continent!

Arrangement of countries under each region shows the most confused way of looking at Africa. No attempt whatsoever was made to show either geographical or historical relation. BC is better than the others, but all the same it is difficult to see why Madagascar should be collocated with Zanzibar thus separating Tanganyika from Mozambique. In DC we find Tunisia and Libya separated from Morocco and Algeria by Egypt, Sudan, and Ethiopia. Both Upper Volta and Niger are provinces of Mali. With nearly half the population speaking Ewe, Togo is still regarded as part of Dahomey and separated from Ghana by Dahomey. The less said about LC the better. Possibly makers of LC depended on works like James Hewitt's Geography of the British Colonies and Dependencies. It is very easy actually: just allocate a few numbers to "British West Africa," etc., and subdivide the whole A-Z. Then you
come up with Ashanti separated from Ghana by Gambia; Lagos in DT513, Nigeria in DT515, and Ibadan in DT518.12—after Sierra Leone. Ilorin, Benin, and Bornu have the rare honor of being regarded as Nigerian towns. There is also an “etc.” under Nigeria. Knowing that Ibadan is in DT518, we do not know what the “etc.” stands for.

Only LC made any attempt to subdivide general history of Africa into periods. But, even then, the subdivisions are arbitrary. As for BC, African history starts with colonization and settlement by Moslems and white people (OSG). And, for periods of African history as provided by Schedule 4 (a), there is no other period before the Partition (OSP) and it seems there is no other even after that. Instead, provisions are made for British possessions and protectorates, etc. (OSQ-OSV). OSH, which ought to have been left for social history, is reserved for “Population: Increase during European occupancy.” Apparently there was no increase in population until the coming of Europeans. In DC the going is even simpler: Africa had no historical period before 640 A.D. and only one period between 640 A.D. and 1900 (960.2).

Of all the regions, North Africa is the best provided for in the schedules. The reason being that since the area “... is emphatically a Mediterranean land closely linked throughout the ages with the lands on the other side of the midland sea, steeped in history and integrally connected in every century with the politics of the Southern Europe and Western Asia,” more intensive studies have been carried out about the countries than about any other region or country. Of all the schemes, only LC treats Egypt as having a continuous history from ancient times to the present. DC has ancient Egypt in 932 and modern history of Egypt in 962. The ancient history is divided into two periods: Earliest–332 B.C. (932.01) and 332 B.C.–640 A.D. (932.02). (Also there is something magical about 640 A.D. We have seen that, under Africa, DC has a period “Early history, 640 A.D.–1900.” It seems, according to DC, that 640 A.D. was the turning point not only in the history of Egypt but also that of Africa.) Neither Kush nor Nubia is mentioned—not even in the index. As in other parts of the scheme, BC provides alternatives for the classification of the history of Egypt. Ancient Egypt is classified in LM since “Ancient History for the most part relates to certain Mesopotamian and Mediterranean lands. ...” Medieval and modern Egypt is classified in OTE-OTF. If the history of Egypt is to be treated as continuous, BC prefers LM since “... Greece and Egypt are exceptional in that their ancient is so much more important than their modern history. ...” There is, therefore, provision for classification of modern Egypt (LMW-LM&).

The only two other areas where attempts are made to provide for historical periods are Ethiopia and South Africa. As regards DC, the history of Ethiopia started with the period of Arab rule 640 A.D.–1543 (963.02). Both LC and BC have some provision for ancient Ethiopia and the Funj Kingdom of Sennar. But the provisions in all the schemes are very sketchy and confusing. Only when we come to the twentieth

*Volume 16, Number 2, Spring 1972*
century do we find a semblance of some order.

As for the rest of Africa, since “. . . Africa . . . possesses practically no history before the coming of the Europeans . . . ,” and since according to Professor Trevor Roper of Oxford University, African history is no more than “the unrewarding gyrations of barbarous tribes in picturesque but irrelevant corners of the globe,” we do not expect to find much.\(^9\)\(^10\) As regards DC, the only other countries which have more than three historical periods are Algeria, Cameroun, Sierra Leone, South Africa, Tanganyika, Togo, Tunisia, and Zanzibar. As for LC, since the rest of Africa is divided into British, French, or Portuguese possessions, it will be asking too much to look for historical periods or much subdivision. Everything goes under “General works.” It is true that provision is made for Ashanti (DT507) and, in the revised schedules, for Mali Empire (DT532.2). But in the case of Ashanti, it is not clear whether this provision is for works on the rise of the Ashanti in the seventeenth century, or Ashanti as a country, or Ashanti as a part of Ghana—since Ghana is in DT510. For subdivisions under countries BC is better than the others—at least to the extent that there is Schedule 4 (a) to be applied. But that is the end of it.

In all the schemes, therefore, it is in vain that we look for places to classify many works of African interest. In West Africa alone, we have to recast all the schedules in order to accommodate works on the old Ghana empire, the kingdom of Bornu, and the Songhai and Mali empires. In East Africa, it is almost impossible to classify Zimbabwe. And if we must mention other phases and periods of African history, we can go on and list the kingdoms of Benin and Oyo, the Fon Kingdom of Dahomey, and the Akwamu Kingdom of the Gold Coast in West Africa and the Czwezi and Kilwa Kingdoms in East Africa; and yet, many works are being published covering these areas.

It is recommended that, for classification of African history, we use classes FA-FZ (LC), 970-989 (DC), and N (BC).

**Ethnology**

Six out of thirteen titles listed in Appendix 2 were differently classified (according to LC) by L.C. and the British National Bibliography (B.N.B.). There was broad agreement in the remaining seven titles. Quite apart from the individual classifier’s point of view at any given time, we are faced with the main problem posed by DC: that there is so very little provision made for classification of races. Three provisions are made: (1) 572.7 Primitive races which may be taken as equivalent to what Bliss called “Less cultured peoples”; (2) 572.8 Specific races where we are asked to divide, like 420-490, which for Africa is useless; (3) 572.9 Races in specific countries; and we are asked to add area notations 3-9 to 572.9, that is, using the History numbers, which we have already seen are inappropriate. This can be seen from the fact that the Ewes of Ghana will be in 572.9667 while the Ewes of Togo are classed in 572.96681. But assuming that it is possible to classify races of Africa
under countries, it means that we shall end up by having whole shelves of books on ethnographic surveys of different peoples of a country like Nigeria only subdivided by authors.

The problem with LC is that we never know whether to classify African ethnology in DT or GN. There is no such specification as given in BC, schedule 4(a)(H). That will account for the inconsistency shown in Appendix 2. We have Bantus (DT764.B2 and GN657.B2) and provision is made for Vei (DT630.5.V2), but the only other place we have for it in GN is Liberia (GN655.L5), unless we are supposed to classify it in GN655.V2. Coming to GN, we are asked to class individual peoples or tribes with the country or region in which they live—if provision is not made under a country or region. It is not clear, however, on what basis the different regions and countries were divided and numbers allocated. We are, of course, confronted again with provisions for French West Africa, British South Africa, etc. Only a few countries are given whole numbers. Others are subsumed under regions. And under regions we find a mixture of countries and tribes some of which are contained in the same countries. It is therefore difficult to understand why the Fang of Gabon should have a separate number from Gabon (GN655.F3 and GN655.G3) or why the Tongo of Zambia should be in GN655.T5 and Northern Rhodesia in GN657.R4.

It is only in BC that we find some attempt at systematic classification of African ethnography (KO). But even then we still come up against the usual bias. KL to KN are for Folklore of the "Historic peoples" whose folklore is "more distinct" and "may be termed 'Ethnographic Folk-lore.'" "Because of the close relation to ethnography, the folklore might well follow the same order of peoples." In order to bring "a closer collocation of the ethnography and the human geography of the European and American peoples," KO-KS proves a complete reversal of Schedule 2. Since the "ethnography and folk-lore of the less civilized peoples are more likely to be combined . . . ," provision is made in Schedule 15 (W). The alternative is Section KN "for classifying the folk-lore of the less cultured peoples . . . if that also should be desired separate from the Ethnography in KO-KQ." However, as said above, there is an attempt at a systematic grouping of peoples—at least many tribes are classified into groups of essentially identical language and culture. And Schedule 15 proves a welcome change from the headaches of the other schemes. But the main divisions are still reminiscent of Seligman.11 And under the different groups we still have a mixture of tribes and countries (e.g., KOIK and KOIR). There is nothing wrong in giving Bini a number (KORB) but it is difficult to see why all the other Nigerian tribes (except Hausa and Fulani) should be classed in KORC.

When a new Africa schedule for this section is made, it may be possible to borrow a leaf from BC itself. The new schedules will look like the following.

**KL–KM** Folklore of African peoples

*Volume 16, Number 2, Spring 1972* • 183 •
It will be seen from the above that we have also borrowed a leaf from BC and reversed Schedule 2 to take care of Human Geography (KU-KY).  

Languages

A brief history of the attempts at African language classification has been given elsewhere. In dealing with African language classification, Berwick Sayers' dictum that the classifier "takes the whole of knowledge and first divides it into a number of broad convenient areas which he calls classes" could not have been applicable, for the simple reason that makers of the schemes were not even sure what the "broad convenient areas" were. As of now, some authorities have the broad linguistic groupings as Afro-Asiatic, Khoisan, Niger-Congo, Sudanic, etc. Others have them as Nigritic, Bantu, Sudanic, Khoisan, Hamitic, etc. As if that were not enough, we have a third grouping called Western Sudan, Bantu, E. Bantu, Bushman-Hottentot, Hamito-Semitic or Erytraic, etc. And so, we are up against "... the ridiculous proliferation of typological neologisms in African linguistic classification ..." since we are now "... in possession of so many different terms both classical and aggressively modern ..." that we spend whole days trying to unravel the mess.

In the 16th edition DC had African languages subdivided into (1) African languages, including Hausa, (2) Hottentot, (3) Bushman, (4) Bantu, (5) Negro dialects, and (6) Dialects of Sudan. In the 17th edition it came up with (1) Macro-Khoisan, (2) Bushman, (3) Niger-Congo, (4) Negro dialects, (5) Chari-Nile (macrosudanic), and (6) Commercial languages under which it subsumed Hausa and Swahili. In other words, between 1958 and 1965, Sayers' "broad convenient areas" have been recast. In the 17th edition it has Hamito-Semitic languages in 492-493 which in the 16th edition is called Afro-Asiatic languages. In the 17th edition a new language group is added—"Chad family—including Kanuri" under Hamitic.

In LC we find (PL8000—) a juxtaposition of countries, language families, and special languages listed alphabetically. The only language families listed are Bantu, Bushman group, and Sudanian. Hamitic (including Berber and Cushitic) is classified as an Oriental language, in PJ2301. In the "Additions and changes to June 1964" Nilotic was add-
ed. As indicated above, special languages were listed alphabetically and each given a specific number. But in the additions to June 1955, we find all sorts of instructions about which to cancel and which to substitute.

BC admitted that it had not attempted to resolve the ethnographic, geographic, and linguistic relations involved in African language classification. It, therefore, has three main headings under which it merely named “... the languages that appear prominently”: (1) Sudanic, under which it subsumed Eastern Sudanic, Nigritic, Mandingo, etc., Class-languages, and Western Sudanic; (2) Bantu, where it follows the classification of Malcolm Guthrie (1947) and has eight subsections; (3) Bushman-Hottentot; and (4) Others. It has Egyptian, Berber, Cushite, and Ethiopic languages collocated with Dravido-Munda and Hebrew languages and coordinated with Arabic language under the general heading Hamito-Semitic languages (WV). We can resolve the whole of the above into:

<table>
<thead>
<tr>
<th>BC</th>
<th>DC 17th edition</th>
<th>LC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudanic</td>
<td>Macro-Khoisan</td>
<td>Bantu</td>
</tr>
<tr>
<td>Bantu</td>
<td>Bushman</td>
<td>Bushman</td>
</tr>
<tr>
<td>Bushman-Hottentot</td>
<td>Niger-Congo</td>
<td>Sudanian</td>
</tr>
<tr>
<td>Hamito-Semitic</td>
<td>Negro-Dialects</td>
<td>Hamitic</td>
</tr>
<tr>
<td></td>
<td>Chari-Nile</td>
<td>Semitic</td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td>Nilotic</td>
</tr>
<tr>
<td></td>
<td>Afro-Asian (Hamito-Semitic)</td>
<td></td>
</tr>
</tbody>
</table>

and in so doing shall find that the only “broad convenient areas” common in all of them are the Bushman-Hottentot and Hamito-Semitic language groups. “Convenience” in the schemes therefore connotes notational convenience. The whole of African languages, in D.C. are allocated the equivalent number as the Spanish language, while in LC they have less numbers than the French language.

What, then, is wrong with the general schemes? It is this: division was on the assumption that there was a genus, i.e., African languages which could be subdivided into species (Bantu, etc.) and each species into classes (Bafia, etc.), each of which was again divided into subclasses (Balom, etc.)—in classification parlance from terms of maximum extension to terms of maximum intension. A look at the listing above shows that each was based on, to say the least, a very incomplete knowledge of what was being subdivided. All were agreed on the genus (African languages); each had a hazy idea of what species constituted the genus. And if subdivision breaks down at the level of species, we can be pardoned if we dismiss the whole thing as unrealistic. The problem of African language classification cannot be solved by listing the languages in alphabetical order as in LC. Otherwise we shall end up cancelling and substituting any time we are classifying a new language—as LC is already doing.

Volume 16, Number 2, Spring 1972 • 185 •
It seems that the best way to go about the whole thing would be to discover which dialect belongs to which language, which language belongs to which subfamily, and which subfamily belongs to which family. In that way, we can build classes of dialects under each language, coordinate groups of languages under each subfamily, etc. This is necessary because more and more we are going to be faced with the classification of, not the grammar of Kwa languages, but the phonetics of Ijebu, a dialect of Yoruba language, a language in the Kwa group of the Niger-Congo family. The following diagram serves as an example.

```
      Niger--Congo
         /     \
        /       /
       Kwa     Kwa
          /     /  \
         /   /    /
         IGBO IGBO YORUBA
            /   /    /
           Aro Aro Ikwere
              /      /    /
             Onitsha Ika Oyo
             / \
            Egba Ijebu Ife
```

This may be going into greater detail than is necessary. We agree that as a result of urbanization and the development of great trading centers "many of the splinter dialects of the past are now being absorbed by about a dozen dynamic, hard-core languages." Our thesis all along has been that there can never be meaningful classification of works on African languages until we follow the linguists and break the whole down to the major languages. This way, we will be able to fit in works on the dialects if and when they arise.

In order to accommodate even the main languages, we shall have to use 420 to 480 of DC, at least 5 of BC (after all, we are allowed to do so), and quietly appropriate the whole of PB-PH of LC, thereby having at least 8,000 numbers to play with. Unless we do that, we shall continue to spend days trying to figure out where and how to classify the grammar of Angono, the dictionary of Orungu, the philology of Mano, and the morphology of Njabi. "The work already accomplished in the study of African languages" says Greenberg "... is hardly more than a preliminary sounding into the depths that remain to be penetrated within the vast world of African languages."

Religion

African religion used to be referred to as "primitive" and the word "fetishism" was vaguely used to describe it: "primitive" because it was
regarded as having remained in the lowliest stages even in modern times; “fetishism” as a convenient word to be used for “a limited class of magical objects . . .” such as charms, amulets, talismans.10

Since the schedules for Religion in the main schemes are made mostly for Christian religions, we may not hope for much provision for African religion. In BC there is no specific provision in Class P for African religion. PY is left for Religious societies, etc., that “are not distinctly Christian . . .” (Islam is, of course, provided for in PK). There is provision for religion under History (OSK) but it is meant for Religious influences, conflicts, etc.; e.g., Islam versus Christianity. Another provision is made under Ethnography (KO) Schedule 15 (U) for religion, beliefs, sophiology. DC has only one subsection for “Religion of African or Negro origin” (299.6). There is an attempt at some sort of subdivision in LC, but we find that whereas Egypt has forty numbers, the whole of the rest of Africa has fifty-two numbers. Moreover, it is only under Egypt that we have subdivision into periods and special topics. The rest of Africa is divided into regions, then into countries (A–Z), and finally into ethnic groups (A–Z). As we have indicated elsewhere, A–Z subdivision is always an escapist way of dealing with knotty problems. Since we are now having works on the Maru and Vodu of the Ewes, the Olorun and Orisha of the Yorubas, and the Chukwu and Ikenga of the Ibos we may think of using (1) PY in BC, (2) at least the whole of 299 in DC, and (3) BL 1000–BL2699 in LC to reclassify African religion. As for Christianity in Africa, since the geographical schedules in the main schemes are wrong, we can use our own (See Appendix 3 and 4) in subdividing 276 (DC) PSO (BC) and BR1360-BR1470 (LC).

Geographical Subdivision

In DC we are asked either to subdivide like 496 or 960. We have seen from the above that both are wrong either because of wrong subdivision or wrong subordination. It is therefore recommended that Appendix 3 (with Cutter) be used where there are absolutely no other numbers to use. BC is better than others, but there we have some unexplained coordination and subordination. If we are supposed to go from general to specific, we fail to see why Egypt should come before North Africa as a whole or why Ghana is subordinated to Guinea Coast and Nigeria is not. Appendix 4 will take care of any subdivision (by schedule 2) in BC. We have a vague feeling that when LC tables were said to be “difficult to use” the Committee was thinking of tables for Africa.17 The usual thing is to mention Egypt and a few other countries or regions and then ask us to subdivide A–Z. But even that is child’s play compared with the problem encountered in tables of geographical divisions to be used in Class H. Appendix 4 has been used to expand Tables VII, VIII, IX. It is detailed enough to take in older works, e.g., on Ruanda Urundi. Lack of space prevents our including
expansions for Tables I–VI. Appendix 3 can be used for Table I or such sections as GT158-GT1589.

Conclusion

The few areas surveyed above show the problems facing African librarians and anybody involved in the classification of Africana. Devising a wholly new Africana Classification may not be the solution—after all, the standard schemes are already in use, and, unless it was for a specialized collection, the exercise might do more harm than good. That is why, for African librarians at least, we have suggested certain relocations. But one has to know what one is relocating. Our concern with the main schemes has not been that they are not perfect. No classification scheme is ever perfect. Our concern has been that the basis of subdivision and subordination of Africana (in the standard schemes) is erroneous, and there is little or no provision for revision and expansion.

We realize that drawing up a classification of African history, ethnology, languages, and so on, would require extensive cooperation and coordination between African librarians and Africanists. It is suggested that a body like the Standing Committee of African University Librarians in conjunction with (perhaps) UNESCO and the Central Classification Committee and the Classification Research Committee of the International Federation for Documentation (FID) should set up machinery to produce outlines of classification of Africana. These guidelines may not be perfect, but in the words of Justice Kaufmann, "the impossibility of guaranteeing that a new rule will always be infallible cannot justify continued adherence to an outmoded standard."18

REFERENCES

188 Library Resources & Technical Services
APPENDIX I

Classification of African History in the Different Schemes

<table>
<thead>
<tr>
<th>DC</th>
<th>LC</th>
<th>BC</th>
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</thead>
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<tr>
<td>Africa</td>
<td>Africa</td>
<td>Africa</td>
</tr>
<tr>
<td>North Africa</td>
<td>N.E. Africa, Red Sea Coast</td>
<td>Northern (including N.E.)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Egypt</td>
<td>Egypt</td>
</tr>
<tr>
<td>Libya</td>
<td>Anglo-Egyptian Sudan</td>
<td>Nubia</td>
</tr>
<tr>
<td>Egypt and Sudan</td>
<td>Sudan</td>
<td>Barby States</td>
</tr>
<tr>
<td>Egypt</td>
<td>Nile River</td>
<td>Libya</td>
</tr>
<tr>
<td>Sudan</td>
<td></td>
<td>Cyrenaica</td>
</tr>
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<td>Tripolitania</td>
</tr>
<tr>
<td>Morocco</td>
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<tr>
<td>Algeria</td>
<td>Libya</td>
<td>Algeria</td>
</tr>
<tr>
<td>Mauritania</td>
<td>Central Africa</td>
<td>Morocco</td>
</tr>
<tr>
<td>Mali</td>
<td>Wadai</td>
<td>Sahara</td>
</tr>
<tr>
<td>Upper Volta</td>
<td>W.C. Africa, West Sudan</td>
<td>Eastern (including S.E.)</td>
</tr>
<tr>
<td>Niger</td>
<td>Niger River</td>
<td>Ethiopia</td>
</tr>
<tr>
<td>Senegal</td>
<td>E. Central</td>
<td>Eritrea</td>
</tr>
<tr>
<td>Srra Leone</td>
<td>Erwin Pasha</td>
<td>Br. E. Africa</td>
</tr>
<tr>
<td>Upper Guinea area</td>
<td>East Africa</td>
<td>Kenya</td>
</tr>
<tr>
<td>Gambia</td>
<td>Italian East Africa</td>
<td>Uganda</td>
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<tr>
<td>Guinea Rep.</td>
<td>Ethiopia</td>
<td>Tanganyika</td>
</tr>
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<td>Eritrea</td>
<td>Zanzibar</td>
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<td>Liberia</td>
<td>Somaliland</td>
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<td>Ivory Coast</td>
<td>British East Africa</td>
<td>Mozambique</td>
</tr>
<tr>
<td>Ghana</td>
<td>Protectorates, regions,</td>
<td>Nyasaland</td>
</tr>
<tr>
<td>Dahomey</td>
<td>cities, etc., A-Z, e.g.,</td>
<td>Rhodesia</td>
</tr>
<tr>
<td>Togo</td>
<td>Buganda, Kenya,</td>
<td>S. Rhodesia</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Nairobi, etc.</td>
<td>N. Rhodesia</td>
</tr>
<tr>
<td>Central Africa</td>
<td>Tanganyika</td>
<td>Southern (incl. S.W.)</td>
</tr>
<tr>
<td>Lower Guinea area</td>
<td>Mozambique</td>
<td>Union of S. Africa</td>
</tr>
<tr>
<td>Cameroun</td>
<td>Madagascar</td>
<td>Cape Province</td>
</tr>
</tbody>
</table>

Volume 16, Number 2, Spring 1972
APPENDIX 1 (cont’d)

DC
Gabon and Congo
Gabon
Congo
Angola
and Chad
Chad
Congo (Leo.)
Rwanda and Burundi
Rwanda
Burundi
Uganda and Kenya
Uganda
Kenya
Somaliland and Socotra
French Somaliland
Somalia
Tanganyika and Zanzibar
Zanzibar
Tanganyika
Mozambique

South Africa
Transvaal
Rhodesia and Nyasaland
South Indian Ocean
Islands
Madagascar

LG
West Africa, West Coast
Upper Guinea
Lower Guinea
British West Africa
Local
Ashanti
Gambia
Ghana
Lagos
Nigeria
Sierra Leone
Other regions, cities, etc., A–Z.
Hausa
Ibadan
French West Africa
Dahomey
Guinea
Ivory Coast
Fr. Equatorial Africa
Gabon
Middle Congo
Chad
Senegal
Sudan
Cameroun
Togoland
Angola (Port. West Africa)
Portuguese Guinea
Spanish West Africa
Fernando Po
Liberia
Congo River and region
Congo (Leo.)
Other countries and regions
(W. A.)
Islands
S.W. Africa
South Africa
British South Africa
Union of South Africa
Basutoland
Bechuanaland
Cape Province
Nyasaland
Natal
Orange Free State
Transvaal
Rhodesia
Swaziland

BC
Bechuanaland
S.W. Africa
Angola
Congo (Leo.)
Ruanda Urundi
Fr. Eq. Africa
Gabon
Middle Congo
Ubangi-Shari
Chad

Western Africa
Spanish Guinea
Cameroun
Nigeria
Guinea Coast
Dahomey
Togoland
Ghana
Ivory Coast
Liberia
Sierra Leone
French West Africa
Guinea
Portuguese Guinea
Cape Verde Island
Senegal
French Sudan
Timbuktu
Niger

Library Resources & Technical Services
**APPENDIX 2**

*Works on African Ethnography*

Showing:— (a) LC Classification; (b) Dewey Classification as done at L.C.;
(c) Dewey Classification as done by B.N.B.

<table>
<thead>
<tr>
<th>L. C.</th>
<th>D. C.</th>
<th>L. C.</th>
<th>B. N. B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOHANNAN, P.</td>
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**APPENDIX 3**

*Broad Subdivision of Africa*

Recommended for use in specific subjects where one or very few places are provided for Africa. It is an alphabetical arrangement of countries under regions. Cutter countries and their subdivisions.

Africa

North: Algeria, Egypt, Libya, Morocco, Sudan.

Africa South of the Sahara

West: Cameroun, Central African Republic, Chad, Dahomey, Gambia, Ghana, Guinea, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Portuguese Guinea, Senegal, Sierra Leone, Spanish Sahara, Togo, Upper Volta.


Central: Angola, Burundi, Congo (Brazzaville), Congo (Kinshasa), Equatorial Guinea, Gabon, Malawi, Mozambique, Rwanda, Rhodesia, Zambia.

South: Botswana, Lesotho, Malagasy, Namibia, South Africa, Swaziland.

*Volume 16, Number 2, Spring 1972* • 191 •
APPENDIX 4

Detailed Subdivision of Africa

Africa
North Africa
   Egypt
   Sudan
   French North Africa
   Libya
   Tunisia
   Algeria
   Morocco
   Spanish Sahara (Rio de Oro)
   Mauritania

Africa South of the Sahara
Atlantic Ocean and Islands in it
West Africa
   British West Africa
   French West Africa
   Senegal
   Gambia
   Mali
   Upper Volta
   Niger
   Guinea Coast
   Portuguese Guinea
Guinea
   Sierra Leone
   Liberia
   Ivory Coast
   Ghana
   Togo
   Dahomey
   Nigeria
   Lagos
   West
   Mid-West
   East
   North

Equatorial and Central Africa (cont.)
   Congo (Brazzaville)
   Congo (Kinshasha)
   Ruanda Urundi
   Rwanda
   Burundi

Southern Africa
   Angola
   Namibia
   Botswana
   South Africa
      Cape Province
      Natal
      Orange Free State
      Transvaal
   Lesotho
   Swaziland
   Mozambique
   Rhodesia and Central Africa
      Federation
   Rhodesia
   Zambia
   Malawi

East Africa
   British East Africa
   Tanzania
   Tanganyika
   Zanzibar
   Uganda
   Kenya
   Ethiopia and Somalia (Italian East Africa)
   Ethiopia
   Somalia
      British Somaliland
      Italian Somaliland
      French Somaliland
      French East Africa
   Indian Ocean and Islands in it
      Malagasy
      Mauritius

APPENDIX 5

LG Tables of Geographical Divisions Following Class H.

N.B.: Because of lack of numbers certain subordinations have to be made, e.g., in Table IX under French Equatorial Africa (360) and South Africa (362).

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- 194 -

Library Resources & Technical Services
Automation Activities in the Processing Department of the Library of Congress

Compiled and edited by
HENRIETTE D. AVRAM
MARC Development Office
LENORE S. MARUYAMA
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This article reports on activities relating to the automation of technical processing at the Library of Congress. The master guidelines for automation of the LC core bibliographic system are discussed, and the following individual projects are described: Machine-Readable Cataloging (MARC) and related activities; RECON Pilot Project; format recognition; multiple use MARC system; Order Division project; automated process information file; subject headings project; filing program; book catalogs; and the Card Division project.*

Introduction

THE RESPONSIBILITY for automation of technical processing in the Library of Congress is divided among four units of the Processing Department: the MARC Editorial Office, the Technical Processes Research Office, the Card Division, and the MARC Development Office. Prior to June 1970, the core group of the present MARC Development Office was part of the Library's Information Systems Office, then in the Office of the Librarian. In the spring of 1970, the Information Systems Office was transferred to the Administrative Department and subsequent to that time, the MARC Development Office was established in the Processing Department to concentrate on those aspects of the Library's total automation program that are concerned with technical processing.

* The following persons made substantive contributions to this article: James E. Agenbroad, Lawrence H. Alkofer, Henriette D. Avram, Pamela Q. Jensen, Lenore S. Maruyama, Lucia J. Rather, Thomas W. Synnott, T. Arlene Whitmer, MARC Development Office; John C. Rather, Technical Processes Research Office; Barbara J. Roland, MARC Editorial Office; and Mary Kay Daniels, Card Division.
With respect to automation, the four units in the Processing Department are charged with the following:

1. The MARC Editorial Office is responsible for the conversion of catalog records to machine-readable form and for updating and correcting the Library's files of these machine-readable records.

2. The Technical Processes Research Office is responsible for analyzing and evaluating the bibliographic control devices maintained by the Processing Department and making recommendations for their improvement, taking account of the capabilities of the evolving automated system. The Technical Processes Research Office also works closely with the MARC Development Office in the design and implementation of specific automation projects.

3. The Card Division is responsible for a mechanization program to scan order slips automatically and to produce printed cards on demand and for duplication and distribution of MARC tapes to subscribers.

4. The MARC Development Office is responsible for the development and implementation of automated systems for the following: (a) internal bibliographical controls in technical processing; (b) conversion of cataloging and authority data to machine-readable form; and (c) use of these records to produce book catalogs, special listings, other printed output, and MARC tapes.

The work involved covers the entire spectrum of technical processing from the point of acquisitions through production of catalog cards and book form catalogs for the Library of Congress and the library community. In order to accomplish these objectives, the four units maintain very close liaison, using the team approach across organizational lines when required.

Past reports and articles have concentrated on the MARC and RECON efforts. Since these projects have a significant impact for the users of LC bibliographic products, their activities during the past year are summarized in the following pages. However, the principal purpose of this article is to describe in some detail other projects and future plans that are not so familiar to the library community. Although these projects turn our sights inward, they will eventually contribute to the improvement of the Library's services.

Creation and Distribution of MARC Records

The actual conversion process (editing, keying, and proofing) is the responsibility of the MARC Editorial Office, which was established in March 1969 prior to the beginning of the MARC Distribution Service. By the end of 1971, approximately 228,000 bibliographic records for English language monographs had been converted into machine-readable form. Of this number, 111,027 were converted during this calendar year (1971). In addition, there are approximately 16,000 rec-
ords on the residual data base (an in-process file of records not yet distributed to MARC subscribers).

Although the majority of these records represent currently cataloged items, 63,104 consisted of retrospective records, which were converted by the RECON Production Unit of the MARC Editorial Office. This unit, which was in existence from August 1969 to June 1971, constituted the production arm of the RECON Pilot Project. Details of the research conducted during the pilot project are described in another section of this article.

The MARC Editorial Office continues to be troubled with periodic backlogs due to the erratic nature of its receipts. Three times in the past year substantial backlogs accumulated. Aid was solicited from the Descriptive Cataloging Division to help with an influx of records resulting from the reduction of backlogs in other divisions. Overtime paired with a reduction in receipts was also effective in reducing the backlog. In addition, the retention of two verifiers and two editors from the RECON Production Unit enabled the MARC Editorial Office to process an exceptionally large number of records during the busy last months of the year. During this period, several of the weekly tapes exceeded 2,000 records each, the largest tape being 3,014 records for the week of November 10 to 16, 1971.

The MARC Editorial Office has worked closely with the MARC Development Office and the Technical Processes Research Office in the application of new techniques prior to implementation in a production mode. MARC editors proofed simulated format recognition records and provided valuable comments to the designers of the format recognition program. The three offices have also collaborated in the compilation of cost figures for machine-readable records and the computer program to provide these statistics.

Tapes for the MARC Distribution Service are now duplicated and distributed directly from the Library of Congress Card Division to sixty-two subscribers in this country and abroad. Until the end of 1970, these services had been provided on a contractual basis by Argonne National Laboratories in Illinois. With the elimination of transportation time to Illinois, subscribers of the weekly tapes usually receive their mini-reels one day earlier. The MARC Distribution Service will be expanded to include records for motion pictures and filmstrips during 1972 and, if funding is received, for French monograph titles during fiscal year 1973.

The weekly tape distributed on October 12, 1971, contained the first batch of Cataloging in Publication (CIP) records. Cataloging information on these MARC/CIP records is generally complete, with the exception of the collation statement and information on pagination in notes. When the Library updates the CIP record from the unbound gatherings or published book, the MARC/CIP record will also be updated and redistributed as a full MARC record. It is expected that MARC subscribers will be receiving catalog copy for CIP titles from four to six months before publication (slightly less for reprints).
MARC records now serve as input to the Card Division Mechanization Project which prints catalog cards from these machine-readable records with a photocomposition device, the VideoComp. This interface with the Card Division necessitated changes in the flow of work in the MARC Editorial Office, but careful analysis of the requirements made it possible to implement the changes with minimum disruption.

MARC Activities

Activities in the MARC Development Office related to machine-readable records include development of new formats, addition of new data elements, compilation of various products from the MARC database, and coordination of reference services concerning MARC. In addition, a new system to input and to process MARC records is being designed and is described in the discussion of the Multiple Use MARC System.

Work is continuing on MARC formats at the Library of Congress. A fifth edition of Books: A MARC Format and a new format for films have been published by the Government Printing Office. Formats for manuscripts and music, including both music scores and sound recordings, are being prepared for publication in 1972. An addendum to the serials format has also been issued by the Government Printing Office.

Significant progress in the area of standardization for machine records was made with the publication of American National Standard for Bibliographic Information Interchange on Magnetic Tape (ANSI Z39.2-1971). The MARC formats developed at the Library of Congress are implementations of the ANSI standard. This standard has also been recommended for adoption by the International Standards Organization.

New data elements have been added to the MARC format for books to increase the usefulness of the MARC records. The Superintendent of Documents classification number, which is presently added to the LC catalog card when available, also appears on the MARC records. Indicator positions for certain title fields in the MARC record (full title, uniform title, romanized title, and series title) now contain a value which specifies the number of characters at the beginning of these fields to be ignored in filing. In addition, the criteria for assignment of the Geographic Area Code have been expanded so that a book with a geographic orientation would be assigned a code even if no geographic terms appear in the subject headings.

The MARC Development Office has provided or coordinated various kinds of reference services to LC staff members and to librarians in this country and abroad. Information about the MARC formats, LC automation projects, and other related topics has been disseminated to hundreds of visitors and to many more people through correspondence. In addition, staff members of the MARC Development Office have participated in MARC institutes, the most recent one being held during February 1972, and many conferences. The MARC Develop-
ment Office has also provided advice in the development and/or implementa
tion of MARC projects in other countries, such as Great Britain, France, Italy, West Germany, Australia, Canada, the Netherlands, and Japan.

Products, in the form of listings or cards, have been provided from
the MARC Data Base primarily for the use of LC staff members. With
the use of a special program called the MARC Retriever, the following
have been produced on a regular basis: listings or cards of records that
represent conference proceedings, translations into English, reference
works (encyclopedias, dictionaries, directories, etc.). Also on a regular
basis, cards for the map shelflist and monthly and quarterly cumulative
listings for maps, arranged by author, subject, and geographic area,
are being produced. In addition, regular runs have been instituted
recently to obtain titles on Africa, China, and topics related to "population." A few Retriever runs have been done for outside requests, in-
cluding translations into English in the field of literature and the num-
for outside requests is based on the amount of computer time re-
quired. The MARC Retriever program has been described in detail in
an earlier article.5

RECON Pilot Project

From August 1969 to August 1971, staff members connected with
the RECON Pilot Project investigated various aspects of converting
retrospective catalog records to machine-readable form. Progress re-
ports on the pilot project have appeared in professional journals, and
the final report will be published in 1972.6 7 8 9 10

The RECON Pilot Project encompassed the following areas: (1)
conversion of records for English language monographs cataloged in
1968 and 1969 but not included in the MARC Distribution Service;
(2) development and implementation of format recognition processing
(described in another section of this article); (3) investigation of in-
put devices for use in large-scale conversion efforts; (4) investigation
of microfilming techniques to provide hard copy source documents for
retrospective conversion; and (5) study of older English language and
foreign language monograph records to identify problems likely to oc-
cur when converting records other than recent English language mono-
graphs.

Results of research are summarized here since more detailed dis-
cussions have been included in the above-mentioned articles.

Conversion of retrospective records for the pilot project was handled
by a special unit in the MARC Editorial Office. In addition to the
usual editing and proofing functions, the RECON editors participated
in several experiments to test the feasibility of procedures proposed by
the research staff. Different methods of catalog comparison (checking
the catalog record used for input against its corresponding main entry
in the LC Official Catalog for changes or revisions) were tested in

Volume 16, Number 2, Spring 1972
terms of efficiency, cost, and MARC system requirements. The RECON editors also participated in a foreign language editing test and simulated the format recognition proofing procedures.

Although investigation of input devices was part of the research efforts for retrospective conversion, it also had ramifications for input of current MARC records. The studies included the following tasks: (1) comparing other keying devices with the Magnetic Tape Selectric Typewriter (MT/ST) used at the Library to see if the other devices might not be more efficient; (2) determining if the development of direct-read optical character readers had progressed to a point where such equipment could be used to scan LC printed cards; (3) selecting a terminal device that would meet the Library's requirements for on-line correction procedures; and (4) comparing the use of a mini-computer with the present off-line input system to determine if there were any technical or cost advantages to be gained.

Two keying devices investigated during the pilot project were an OCR font typewriter/optical character reader and the Keymatic Data System Model 1093. Some of the records converted during the project were actually keyed by a contractor using an IBM Selectric typewriter equipped with an OCR font. The resulting hard copy was then scanned by a Farrington Optical Character Reader. Costs for using this method were slightly higher than using the MT/ST and a tape converter. The main disadvantage was having to type a shift character in front of each uppercase character because the scanner could only read one case. A Keymatic device was installed at the Library for a two-month period for testing and evaluation. This device did not increase production rates substantially to offset its higher cost, and the typists reported that the keying process was made more difficult because the Keymatic did not produce any hard copy.

Investigation of direct-read optical character readers that could scan LC printed cards was not encouraging. Two devices, the Compu-Scan Model 370 and the Scan Data, were tested and proved to be inadequate for this purpose. Characteristics of the printed cards which are not discernible to the human eye, such as worn type fonts or touching characters (portions of one character touching another character), caused difficulties for the OCR scanners and would have been too costly to correct by computer programs.

On-line terminal devices, primarily cathode ray tubes (CRT), were investigated for possible use in MARC correction procedures. Subsequent to these studies, consideration has also been given to the use of CRT devices for input and display for the automated Process Information File.

The study of mini-computers for use in MARC input and correction procedures concluded that although its use was technically feasible, there were no economic or technical gains to be obtained considering the LC hardware configuration at the present time. The processing load taken off the IBM 360/40 computer by a mini-computer was not
enough to justify the added cost imposed by the mini-computer.\textsuperscript{16}

The feasibility study for retrospective conversion postulated a strategy for a large-scale project: microfilming cards from the LC Card Division record set to provide source documents and comparing these cards with their corresponding main entry in the LC Official Catalog to find changes or revisions.\textsuperscript{17} Although it was proposed in the RECON feasibility report that records required for the conversion project, e.g., English language monographs from 1960 to 1968, would be selected from the record set and then microfilmed, investigation during the pilot project resulted in a change of procedure. All records for a particular time period, e.g., from 1960 to 1968, would be filmed after which the selection of the required subset (English language monographs) would take place.\textsuperscript{18} With the assistance of the Library's Photoduplication Service, cost estimates were obtained for four methods of microfilming.\textsuperscript{19} Although microfilming for a Xerox Copyflo printout of a card overlaid on a 8 x 10½ worksheet was the most costly, this method appeared to be the only one that would meet the requirement of providing source documents with relative ease. [Source documents for use during the pilot project were not obtained by microfilming cards from the record set. Since there was only a relatively small number of records to be converted (English language monographs cataloged during 1968 and 1969 which were not included in the MARC Distribution Service), these records were obtained from card stock.]

Because production operations of the RECON Pilot Project were limited to English language records in the 1968, 1969, or 7-series of card numbers, it was recognized that many problems concerning retrospective records would not be encountered in the conversion of relatively current titles. One of the research tasks conducted during the pilot project consisted of analyzing 5,000 records for older English language and foreign language monographs. Problems with the cataloging data ranged from ellipses at the beginning of a title field or capitalization of National Library of Medicine subject headings, which would affect the format recognition algorithms, to different places of publication separated by hyphens (instead of commas).\textsuperscript{20} After these matters had been resolved and incorporated into the editing instructions, a foreign language editing test was conducted to determine if editors with relatively little formal training in foreign languages could maintain acceptable production rates. Although their rate of editing French and German records was approximately the same as their rate of editing English titles, the number of errors made was considerably higher. One of the main conclusions of this experiment was that it was necessary for editors to have a good knowledge of foreign languages in order to edit these records accurately.\textsuperscript{21}

In addition to the work done at the Library of Congress, several projects were undertaken by the RECON Working Task Force, whose members represented different segments of the library community. One of the first tasks completed involved identifying levels or subsets of

\textit{Volume 16, Number 2, Spring 1972} \hfill \textbullet \ 201 \textbullet
the established MARC format that would still allow a library using a lower level to be part of a future national network. This study concluded that for distribution purposes, the full MARC II format should be used in order to satisfy the needs of diverse installations and applications. For purposes of reporting holdings to a national union catalog, however, it would be feasible to identify a lower level than the full MARC II format.

Additional tasks in the final stages of completion include the following: (1) investigation on the implications of a national union catalog in machine-readable form; (2) study on the possible utilization of machine-readable data bases other than that of the Library of Congress in a national bibliographic store; and (3) investigation of alternative strategies to convert retrospective catalog records of the Library of Congress to machine-readable form. Progress reports on these tasks have been included in the professional literature, and the final report of the RECON Pilot Project will contain the results and conclusions of these research efforts.

**Format Recognition**

**Background.**—The preparation of bibliographic data in machine-readable form involves labeling each data element so that it can be identified by the computer. For this purpose, the MARC format employs tags, indicators, and subfield codes (content designators). In the current MARC system, these content designators are supplied by the MARC editors before the data are typed on a MT/ST. The MT/ST tape cassette is converted to computer-compatible tape which is then run through a series of computer programs to produce a proofsheet. In the proofing process, the editor compares the proofsheet against the original worksheet, checking for errors in editing or keying. Corrections are retyped and processed by the MARC system programs. A new proofsheet produced by the computer is checked again for errors. Records that are error free or "verified" are then removed from the work file and stored in a master file.

The editing process in which the content designators and fixed field information are assigned manually is a detailed and somewhat tedious process. It seemed advantageous to develop a method that would use the computer instead of an editor to assign the content designators for bibliographic data. This technique of examining data strings for certain keywords, significant punctuation, and other clues is called format recognition.

The Library began its work on format recognition in the winter of 1968 with a feasibility study which was completed in February 1969. At that time, a certain amount of editing for MARC records was performed by the catalogers. The original feasibility study tested the possibility of using format recognition for the content designators not already supplied by the catalogers. This study concluded that a format recognition technique on partially pretagged data would be correct 85
percent of the time; that is, roughly 85 out of 100 records would be processed without error.

The results of this initial study were encouraging enough for the Library to proceed with the development of format recognition as part of the RECON Pilot Project. Although the impetus for format recognition originated with conversion of retrospective records, this technique has been designed to accommodate current catalog records as well.

Implementation.—Implementation of the project was divided into several tasks. In the first task, the algorithms from the initial feasibility study were examined again to see how successful they would be if there were no human editing. This study assumed that the typists would type directly from a printed catalog card or a manuscript card. The computer program would take this raw data and supply the necessary content designators. Determination of the accuracy of setting fixed fields completely by computer was also included in this study. The results, assuming accurate typing, showed that records could be processed correctly approximately 70 percent of the time; that is, 70 out of 100 records would be correct, and the other 30 records would have errors in one or more fields. Based on these results, the decision was made to implement format recognition using unedited catalog records.

The second task covered several areas, including the development of input specifications for the typist. In general, these specifications provide for typing the record from an untagged card on an input device with a typewriter keyboard. The information on the card is transcribed from left to right and from top to bottom. The data are input as fields, which can be detected by the program because each field ends with a carriage return and each field continuation by a carriage return, tab. Each field comprises a logical portion of the card; thus, the call number is input as a separate field, and likewise, the main entry, collation, each note, each added entry, etc. The title paragraph is input as a single field with the title, edition, and imprint separated by delimiters.

Keyword lists for English language material were compiled. The sixty lists contain over 2,500 words covering items such as corporate name keywords, U.S. cities, foreign cities, bibliography note keywords, honorary titles used with personal names, etc.

The final product of the second task was the preparation of logical specifications for the entire program. These specifications were published for the Library by the American Library Association under the title, Format Recognition Process for MARC Records; A Logical Design.

The program logic consists of the following steps:

1. Gross identification is made of each field. For example, fields beginning with Arabic numbers (followed by a period) are iden-
tified as subjects; fields beginning with numbers are tagged as Dewey numbers or LC card numbers; fields beginning with parentheses are called series statements or series added entries.

2. Each field is completely analyzed to complete the tag, indicator, and subfield codes, taking into account punctuation or the presence of keywords. For example, a subject field that includes the word “Company” is identified as a corporate name type subject.

3. Each field is analyzed for keywords to set coded values in the fixed fields. For example, if the word “Paris” is found in the place of publication in the imprint field, the code for France is placed in the country of publication fixed field.

Prior to the coding of the format recognition programs, a manual simulation was conducted to test and to improve the algorithms, keyword lists, and input specifications for the typists. Records for 150 English language monographs, generally consisting of “difficult” records, were selected for the simulation. The results indicated that format recognition did cut down on the amount of time spent in the combined editing and proofing process, but it was demonstrated that the success of the program depended heavily on the following factors: (1) extensive training for the input typists—since the algorithms depend on keywords, punctuation, etc., accuracy in typing becomes extremely important; and (2) extensive training for the editors to alert them to the kinds of errors the format recognition programs might make and to make them aware that the programs were written to make their jobs less tedious.

The final tasks included the production of detailed flowcharts at the coding level and the actual coding and program testing. Coding began in July 1970, and final testing was completed in May 1971. The program is written in Assembler Language Coding for the IBM 360/40 operating under DOS.

The keyword lists used by the format recognition program are maintained as a separate data set on a 2314 disk pack but are stored in memory when the format recognition program is running. The total amount of core storage required for the format recognition program under DOS is approximately 120K: 80K for the program and 40K for the keyword lists. Actual machine processing time is one-half second per record.

Keyword List Maintenance Program.—The keyword lists are created and maintained by a separate program. This program provides the flexibility required to change or update the keyword lists, which are expected to be dynamic in nature. New lists will be added as format recognition is extended to other languages, and keywords will be added to or deleted from existing lists as experience is gained in the use of format recognition. If the keyword lists were built into the format recognition program itself, it would be necessary to recatalog the program each time a keyword was changed.
Format Recognition Production.—To date, approximately 17,000 RECON records in the 1968 card series have been processed by the format recognition program since actual production began in May 1971. RECON records rather than current MARC records were used to test format recognition, because RECON records were not needed for an operational project like the MARC Distribution Service. Input of current MARC records through format recognition was begun in January 1972, after it was felt that a smooth operation had been attained.

The workflow for edited records involves the editing process, keying the records on the MT/ST, processing these records on the computer (including converting the MT/ST tape cassette to computer-compatible tape), proofing, and verifying. Format recognition eliminates the editing process. A comparison of the two workflows is depicted in Figure 1.

Production rates for RECON editors were tallied for both con-

\[\text{Figure 1}\]

\text{Workflows}

\text{Volume 16, Number 2, Spring 1972}
version procedures: editing proofing versus format recognition proofing only.

The format recognition production rate of 8.4 records per hour (proofing only) represents a significant increase over the 4.6 records per hour of the combined editing and proofing process. Because proofing format recognition records is more difficult, this rate is slightly less than that (about 9.2 per hour) for proofing edited records. With format recognition records, the editors must be aware of the errors made by the program, which can be quite different from the errors made by human editors, as well as keying mistakes.

Tests were also conducted to compare production rates and keying errors of input typists at the Library using both edited records and unedited format recognition worksheets. Typing rates for edited records averaged 12.9 per hour as compared to 17.4 per hour for unedited records. Typing speed was increased somewhat when keying format recognition records because there were no content designators to be typed. However, errors tended to be more serious since about 28 percent caused the format recognition program to misidentify data, i.e., to assign incorrect content designators.

The limited experience now available indicates that the format recognition technique is of considerable value in speeding up input and lowering the cost per record for processing. At present, complete keying appears to be the only viable method of converting LC cataloging data to machine-readable form. If direct-read OCR devices become perfected to the point of being able to scan LC printed cards, it may be possible to input and process large numbers of retrospective records by using a combined OCR/format recognition process. Until such OCR devices are available, this will remain only a tantalizing idea.

Master Guidelines

When the MARC Development Office was established in 1970, several projects relating to technical processing were in various stages of planning or completion. The Office had access to background information from the systems analysis done for the Central Bibliographic System.

This systems survey was the outcome of the study entitled Automation and the Library of Congress, which concluded that the automation of cataloging, searching, indexing, and document retrieval is technically and economically feasible and recommended that a group be established to administer the effort and that funds be requested for in-depth studies. The study team believed that complete automation was possible by 1972. Although various projects implemented by 1970 have had an impact on the automation program and did provide a useful body of experience, it was obvious that the 1972 date was unrealistic. Therefore, it was essential to review the situation in order to define a systematic plan for the automation of technical processing. This work...
became known as the Master Guidelines Study (MGS).

The study had two principal objectives:

1. To determine a logical and orderly implementation plan for the automation of technical processes according to the following criteria: (a) the automation of the function must be technically feasible (within the state of the art today); (b) the function must be capable of being automated in a reasonable period of time; and (c) the function must be of such scope that it has a significant impact on the operations of the Library of Congress.

2. To provide guidelines that may be augmented and modified in the light of any of the following conditions: (a) research and development activities dictate a different solution; (b) new hardware devices allow for greater flexibility; (c) the funding situation may change, resulting in reduction or expansion of the plan; and (d) experience in an operational mode, serving as a learning mechanism, suggests another approach, etc.

The approach used for the MGS was not the same as the previous studies. Earlier work assumed virtually total automation of all functions involved in the bibliographic control of material and the use of the resulting computer-based files for reference retrieval. On the other hand, the MGS identified those functions in technical processing which would benefit the most from the introduction of automation, determined on a provisional level the technical feasibility of each function so identified, and where feasible, provided a conceptual design and specification for outputs of each function for the Processing and Reference Departments and the library community using LC bibliographic products.

This approach leads to a phased implementation of the functions selected. At each step of this evolving implementation, a new module is built upon the already existing ones, forming a system with greater capability as time passes. There is no built-in requirement to achieve total automation.

The differences in approach between the prior studies and the MGS lead to different conclusions. For example, prior studies assume retrospective conversion of all major files, the MGS does not. Consequently, the digital data storage capacity associated with the first approach is considerably greater than that required by the MGS approach. The degree of automation and the resultant transactions to be performed in the previous studies greatly exceed those required for the MGS approach and, therefore, necessitate a much larger hardware configuration.

In summary, the MGS approach is leading toward an integrated core bibliographic system. It does not assume "instantaneous" automation and recognizes the dangers of both the total systems concept and haphazard automation.

The MGS was conducted by a team of LC staff members, consisting
of two computer systems analysts (Henriette Avram and Harry Gochman) and a librarian (John Rather). Their efforts were augmented by other LC personnel where required. Two members of the team, namely, the librarian and one of the analysts, have had many years of experience in the Library to draw on and understood the complexities of the system and the data to be captured. Most importantly, they were aware of the limits on their knowledge and knew where to turn for detailed information. These circumstances are noted here because of their importance to the analysis and design of all library automation projects. An in-house team of multidisciplined staff is the only efficient method of operation. Contractual support will work only as a supplement to a core group of experienced personnel.

For the purpose of the MGS analysis, technical processing was divided into seven broad functional activities: (1) acquisitions; (2) selection and searching; (3) preliminary control; (4) descriptive cataloging; (5) subject cataloging; (6) shelflisting; and (7) catalog production (card, book, machine-readable).

Each functional activity was then divided into specific functions, and the following types of data and comments were compiled for each function: (1) files and other tools used; (2) volume of activity; (3) status of relevant automation projects; (4) areas that require further investigation; and (5) useful by-products of automation of the function. On the basis of this information and the criteria already given, judgments were made as to the practicality of undertaking to automate all or part of the function. Emphasis was placed on the bibliographical control and use of the file for monographic material.

Several on-going projects, such as merging the tapes for the LC subject heading list and its supplements, etc., were omitted from the analytic framework. Omission of a project did not mean that it was considered unimportant or that it might not be developed further in the time span of these master guidelines. The omission implies only that a particular project was peripheral to the resolution of the main problem, the development of an integrated system.

In the judgment of the master guidelines team, it is proper to develop a core system for building a bibliographic record before exerting too much effort to capture data at the acquisitions stage. At this time, the problem of how acquisitions data could be used as input to the core system is being deferred although studies related to this use will be made at a later date. This approach does not preclude consideration of the automation of specific acquisitions functions to meet the needs of divisions engaged in them. Technical feasibility was determined by assuming a configuration similar to that presently in use at the Library (IBM 360/40).

Although volume figures, feasibility or technical solutions, and storage requirements for the files have been determined by the MGS team, such data have not been included in this discussion. These omissions are intentional since the aim is to make this presentation as straight-
forward as possible. Cost estimates for design, hardware, and software have also been omitted from this preliminary analysis for two reasons: (1) estimating costs for a complex system at this stage could not be definitive; and (2) it did not appear worthwhile to estimate costs until the basic concepts of the master guidelines have been more fully developed.

The study is obviously not complete. It will never be complete but will continue through the lifetime of the automation of LC operations. It is believed, however, that the guidelines provide a sound basis for the systematic planning and development of that automation effort.

The plan described below is now being elaborated at the next level of detail. When that is completed, consideration may be given to enlarging the core system by extending coverage to serials, incorporating copy information, and automating the classification schedules. These points are discussed briefly at the end of this section.

Figure 2 provides a summary of the master guidelines by depicting a proposed activity, its rationale, and its relationships to activities in preceding activities. The chart displays two axes: the vertical is the relationship among the various data bases as they pass through the time line represented by the horizontal axis. Attempting to place these projects in time enforces the discipline of considering their implementation in realistic terms. The time estimates were influenced by several factors: present lack of resources (e.g., understaffing due to space limitations); time to solve complex technical problems, etc. The current projection for the completion of Multiple Use MARC System (MUMS) is January 1974. This date is critical for the automation effort in technical processing because most of the major projects are dependent on the implementation of this system. Therefore, applications requiring on-line input and/or access to the authority files, the MARC Data Base, and the Process Information File are shown after this date.

Column 1.—This column represents the present state of the automation of LC technical processing (discounting as described above the many on-going projects for purposes of clarity).

Order Division Data Base. Task 1 of the Order Division project is operational. This covers the creation of basic records for single orders. Work is in progress on Task 2 (file organization) and Task 3 (accounting system).

At present, no link exists between the Order Division output data and any other machine-readable file. Available information indicates that the vast majority of single orders are for duplicate copies. Only about one-third of the estimated 21,000 single orders in fiscal 1971 were for titles new to the Library. Moreover, there is preliminary evidence that some of the bibliographic information must be changed substantially in one out of every four records. Thus, the net savings in keying would have little impact on the core bibliographic system. For these reasons, it does not seem profitable to develop the capability to use acquisitions records as the basis for bibliographic records at pres-
Figure 2
Development of Machine-Readable Data Bases for Technical Processing
Fiscal Years 1972-1976

1. Card Division data base
   - MARC English
   - Order: 10/71

2. Card Division data base
   - MARC expanded
   - Order: 8/72

3. Card Division data base
   - LCSH
   - MARC Subjects
   - MARC Names
   - MARC expanded
   - Order: 8/73

4. Card Division data base
   - LCSH
   - MARC Subjects
   - MARC Names
   - MARC expanded
   - Order: 1/74

5. Card Division data base
   - LCSH
   - MARC Subjects
   - MARC Names
   - MARC (on-line)
   - PIF (on-line)
   - Order: 8/74

6. Card Division data base
   - LCSH
   - MARC Subjects
   - MARC Names
   - MARC (on-line)
   - PIF (on-line)
   - Order: 8/75

MULTIPLE USE MARC SYSTEM
ent. This possibility will be investigated more fully at a later date.

MARC Data Base. The Card Division Data Base (CDDB) for Phase II of the Card Division Mechanization Project is supplied with all records for English language monographs produced by the MARC Editorial Office. The MARC Data Base is also being used in the following ways: distribution of machine-readable records to subscribers; and preparation of bibliographic tools and lists for users in the Library of Congress and elsewhere. The MARC system itself has been or will be used in the conversion of records for other types of material such as single sheet maps or motion pictures and filmstrips.

Column 2.—This column depicts the expansion of MARC to other Roman alphabet languages (French) and other forms of material (motion pictures and filmstrips). The MARC system will still be tape-oriented at this point. The flow of data continues from MARC to the Card Division to enlarge the file of records used for the automatic production of cards. The production rates at this time will be approximately 102,000 monograph records and 9,000 motion pictures and filmstrip records per year. The growth of this data base is shown in Table 1. Estimates for German titles are included in fiscal 1974, and other romance languages are added in fiscal 1975 (this is a projection that is dependent on funding).

Column 3.—This column shows the application of the computer to

TABLE 1
Growth of MARC and Related Data Bases, Fiscal Years 1971–1976

<table>
<thead>
<tr>
<th>Data base</th>
<th>Total number of records at end of fiscal year</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARC</td>
<td>200,000</td>
</tr>
<tr>
<td>MARC Names¹</td>
<td>53,000</td>
</tr>
<tr>
<td>(13,000)²</td>
<td></td>
</tr>
<tr>
<td>MARC Subjects³</td>
<td>29,000</td>
</tr>
<tr>
<td>(16,000)²</td>
<td></td>
</tr>
<tr>
<td>LC Subject</td>
<td>4</td>
</tr>
<tr>
<td>Headings</td>
<td></td>
</tr>
<tr>
<td>Process Information</td>
<td></td>
</tr>
<tr>
<td>File</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250,000</td>
</tr>
</tbody>
</table>

¹ These figures are based on the assumption that there are 1.6 names per record, 60 percent of the names will be unique, and 24 percent will have references.

² Names and subject headings will be input beginning in January 1973. The number in parentheses is the number of unique headings which have references.

³ These figures are based on the assumption that there are 1.5 topical subject headings per record, 40 percent will be unique in 1973, 30 percent in 1974, 20 percent in 1975, 20 percent in 1976, and 50 percent will have references.

⁴ Although the subject heading list and its supplements are already in machine-readable form, they are not considered usable in terms of the Master Guidelines projects until July 1972.

Volume 16, Number 2, Spring 1972 • 211 •
the production of book catalogs. To accomplish this, four data bases are assumed to be in machine-readable form:

1. MARC (approximately 400,000 records by July 1973, representing English and French monograph records and film records);
2. LC Subject Headings (LCSH);
3. MARC Subjects;
4. MARC Names.

The data base called LC Subject Headings (LCSH) contains only the information included in published lists. The data base called MARC Subjects contains this information for all subject headings that are used in MARC records. The data base called MARC Names contains all the established names that are used in MARC records together with their references. The latter two data bases will be derived in part from MARC records, which would eliminate duplicate keying and, therefore, save both time and money. All of these data bases will be stored on a direct-access storage device.

The technique for building MARC Subjects is as follows:

1. Each topical subject entry in a MARC record will be checked against MARC Subjects.
2. If a match is found, two-way links will be made between the subject heading record and the bibliographic record (i.e., each will contain a pointer to the other).
3. If no match is found, LCSH will be checked. If a match is found there, the subject heading record with its references will be copied for MARC Subjects.
4. A subject heading may be new to MARC Subjects and have no match in LCSH. This occurs when the heading falls in a category (e.g., chemical compounds) that is excluded from the published list. In such a case, the heading will be output as an exception record so that its references can be input manually.

The two subject data bases may be combined in the same physical file by using flags to show which headings are to be excluded from the published list.

More manual effort will be required to construct MARC Names because there is no existing machine file to facilitate the task. The steps might be as follows:

1. When the authority card indicates that the name is not in the machine file, procedures are initiated during the course of cataloging to send the necessary information to the MARC Editorial Office. There are no special problems in obtaining data for newly established headings and older headings that are being modified. These are already being handled separately in the course of regular authority card work. However, special arrangements will have to be made to obtain the necessary information about other established headings. The problem of whether this can be done best

- 212 - 

Library Resources & Technical Services
during cataloging or later in the MARC Editorial Office remains to be solved. If it is to be done by the latter, the cataloging divisions will have to forward information as to whether the heading has a reference in order to avoid needless searches for reference information.

2. When a MARC record is created, the names in it will be checked against MARC Names to make the necessary two-way links between the reference records and the bibliographic record. Any name not found by this check will be output on an exception file for manual checking.

3. MARC Names will also contain links between each established name and any references to it.

The most immediate use of MARC Names and MARC Subjects data is in the machine production of book catalogs and the preparation of name indexes. No attempt has been made to name the book catalogs that might be produced or to describe their format. A study is presently in progress to determine the feasibility and cost of producing a national union catalog in register form with associated name, title, and subject indexes. Such a publication would use records in both machine-readable form and printed cards.

In addition to facilitating the production of book catalogs, this stage of the automation effort should afford some or all of the following byproducts:

1. Improvement in the means of maintaining LCSH and provision for a more rapid publication schedule.
2. Distribution of LCSH on demand.
3. Distribution of MARC Names to MARC subscribers.
4. Production of printed lists of established name headings for general dissemination.

Column 4.—The Multiple Use MARC System (MUMS) is described in some detail in another section of this article. Since this system is essential to the projects described in Columns 5 and 6, its completion is an important milestone in the automation program. The first application of MUMS will be for correcting and verifying MARC records on-line. This capability will enhance the Cataloging in Publication project, the MARC Distribution Service, and the Card Division Mechanization Project. Access to the MARC Data Base at this stage will be by LC card number.

Column 5.—This column depicts the introduction of the automated Process Information File (PIF) into the processing system. This project includes on-line input of preliminary cataloging data, the ability to search the PIF by the Processing Department and other high-volume users in the Library, and the ability to update the machine-readable record in the PIF to show the location of the work as it progresses through technical processing.

Column 6.—This column builds on the data base structure de-
scribed in Column 3 to provide the means of searching each individual data base in an on-line mode to aid the cataloging process. With the implementation of MUMS, the MARC Data Base and access points to this data base will be restructured to allow on-line searching while retaining the two-way linkage established previously between the MARC Data Base and MARC Names and Subjects.

In addition to the MARC Data Base, the PIF will be accessible on-line to assist in the searching function. If the work is not in the machine-readable files, the searcher must proceed to search the LC Official Catalog and, possibly, the residual PIF in card form. However, human intelligence and the passing of time work in our favor. There is usually enough evidence in the work itself to indicate whether it would be in the machine-readable files or whether the search should be conducted in the manual files. As time passes and the machine-readable files of the Library expand to other languages, the use of manual files for searching will diminish although it will never be eliminated completely because of reprints and similar publications.

Roughly one-third of the items currently searched prove to be duplicates. Since a high proportion of duplicates are received fairly soon after original cataloging, a search of the PIF and MARC Data Base can be expected to be useful even during the early period of their existence. This consideration goes far toward justifying the construction and maintenance of such a data base prior to the time that it begins to have a really decisive impact on the search load.

When it has been ascertained in the manual process that a work is not a duplicate, the preliminary cataloger provisionally assigns the main entry, using the name authority file and the bibliographic records in the Official Catalog to determine if the established form of name exists.

It is proposed that this task be carried out in the automated system by extending the accessing facilities associated with MARC Names so that it becomes searchable on an on-line basis. The terminal user will input a name from which the program derives a search key. Information on all name entries which respond to the search key will be presented on a terminal display unit. The names searched include references to names as well as established names. Bibliographic information on the titles associated with any one of the names responding to the original query can also be called up for display from the terminal keyboard. This action is possible because of the linkage already established between names in MARC Names and bibliographic records in the MARC Data Base. Examination of these data is valuable in deciding which established name among a number of possibilities is actually the one which matches the name used in the search.

A negative response to a query of MARC Names would not be conclusive since its contents are only a subset of the name authority records in the Official Catalog. The value of the MARC Names as a search tool will increase as it grows. Meanwhile, it has the advantage of containing
names that are "bibliographically active." As in the case of the on-line MARC Data Base, MARC Names will have to mature before it can play a significant role in the cataloging process. Eventually, it will also be used alone or in combination with the MARC Data Base to assist the descriptive cataloger in establishing a new name or verifying the heading assigned by the preliminary cataloger.

It is also proposed that subject catalogers be allowed to query MARC Subjects alone or in combination with the MARC Data Base from an on-line terminal. The search logic would be designed to find not only those subject records (if any) which match the query exactly but also those with tolerable variations. Bibliographic records which carry a specified subject heading may also be displayed if desired. These facilities should enhance the process by which the assignment of subject headings is made to a new title in process.

Although MARC Subjects will represent only a small proportion of the total corpus of subject headings for quite a while, it should be useful since it includes subject headings associated with recently cataloged titles which are more likely to be called upon in the course of cataloging other new works than subject headings derived from older titles.

On-line access to MARC Names and Subjects will have at least two other advantages: improving the means of maintaining the name file; and further improving the means of maintaining the subject authority file.

Further Considerations.—Serials. Serials were not included in the development of these master guidelines for the following reasons: (1) serials processing is undergoing significant changes at the Library; (2) there was insufficient time to analyze the special features of serials control; and (3) it was difficult to quantify workloads.

On the other hand, the assimilation of serials processing into the core bibliographic system should not require substantial alteration in the general design of the system. The functions of descriptive cataloging, subject analysis, and shelflisting of serials are basically identical with those for monographs. Only the searching function differs significantly because it involves posting new receipts to a master record for titles already in the collection. Since this function comes at the beginning of serials processing, it should be possible to develop an independent module to satisfy the check-in requirement.

Copy Information. Information about the number of copies of a title in the Library and their location would be a useful addition to the MARC Data Base. Such data would assist in locating copies for loan and in determining reference assignments. Thus, there is justification for including copy control information in a MARC record even though it does not help the shelflisting function (i.e., the assignment of new book numbers). The latter problem can be alleviated only by converting entire sections of the existing shelflist; however, to facilitate any
future plan for automating the shelflisting function, a beginning should be made.

Classification Schedules. Consideration should be given to the systematic conversion of the classification schedules. This could be done on the block-building principle because the resulting data base would not be directly linked with any other data base. The main advantage of this conversion would be greater ease in maintaining up-to-date schedules for both in-house use and publication.

Multiple Use MARC System

One of the most important projects under development is the Multiple Use MARC System (MUMS), a software system designed to support bibliographic applications in both on-line and batch modes. Design work for MUMS has been done by Kenneth O. Pittman and Donald D. Fusaro of the MARC Development Office. It was recognized that many of the same support services are required to process various bibliographic applications. If developed separately, each application would be required to produce these support services. Instead of placing this requirement on each application, the supporting services will be provided by MUMS and made available to each application.

MUMS will develop, maintain, and control a central pool of services to provide message control, task definition and sequencing, and data base storage and retrieval functions. Individual applications will provide the software, in the form of program modules, to process their particular tasks. If an application requires a support function that is not already provided through MUMS, the module will be developed by the MUMS staff according to specifications provided by the application and added to the MUMS central pool of functions. Similarly, application modules will be shared in this manner, i.e., a module originally developed by one application may prove useful to some new application. MUMS will control these applications modules and make them available to new applications as needed.

MUMS is designed to operate on an IBM 360/40 under OS and under the control of the Customer Information Control System (CICS). CICS is an IBM data base/data communications software package that will provide the interface between the IBM 360 operating system and the user-written processing programs. CICS provides the following functions to support the user-written programs: (1) Task Management; (2) Storage Management; (3) Program Management; (4) Terminal Management; (5) File Management; (6) Transient Data Management; and (7) Temporary Storage Management. Of these seven functions, MUMS will utilize only four: Task Management, Storage Management, Program Management, and Terminal Management. MUMS makes use of the various functions, such as Storage Management, by requesting services from CICS at various intervals in the MUMS processing cycle.

MUMS is considered an application of CICS. When CICS receives a transaction record, it makes the determination that the record is a
bibliographic record and transfers control to MUMS. MUMS then provides the necessary software to process the record, making requests to utilize the functions supplied by CICS as required to process the particular transaction.

MUMS itself is comprised of three distinct function areas: (1) Task Management (subordinate to CICS Task Management), (2) Message Control, and (3) Data Management.

Task Management.—The Executive Control Function (ECF) of Task Management will be the first program executed in MUMS. The ECF will connect the support and application modules appropriate to a given application, establish their sequence of operation, and regulate their operation. The ECF will also be responsible for determining the order of priority in which the applications are to be run. Control information for each transaction record to provide the interface between MUMS and the application modules will be generated by ECF.

All transaction records will be dispatched to MUMS with the same priority value. The ECF will examine the transaction record, and by means of a process code, it will determine the priority of the transaction record. This priority will determine the order in which each transaction record will be processed in a multiprogramming environment.

Much of the processing performed by MUMS will be accomplished by passing control from one application program module in the sequence of operations to the next application program module. The technique employed to invoke the basic control transfers is called a process string, a program subroutine structured to support a specific transaction. The process string will contain a variable number of control transfers and will allow MUMS to define and control the sequence of application operations (programs) and regulate their execution.

Message Control (described below) will provide the capability to process in either on-line or batch mode through its Batch Support program or its Terminal Support program. One function of Task Management will be to invoke the transfer to the correct program depending on which mode is required. Task Management will also provide the facility to collect system and application statistics. These statistics will be used to monitor the system and to plan for system growth in an orderly and systematic fashion.

Message Control.—Message Control will provide the interface between the input/output devices and the application programs to process the transaction records. Initially, two input devices will be supported by Message Control: the Magnetic Tape Selectric Typewriter (MT/ST) and a keyboard entry device-cathode ray tube (KED-CRT) terminal. The Batch Support Program (BSP) will provide the software to support the MT/ST input devices; the Terminal Support Program (TSP) will provide the software to support the KED-CRT terminals.

Batch input will be prepared on the MT/ST. Procedures now in

*Volume 16, Number 2, Spring 1972*  

- 217 -
use for input of MARC records will continue to be used for input to MUMS. The primary function of BSP will be to structure input data into a processing format to be used by Data Management and the applications programs.

On-line input will be prepared on a KED-CRT terminal, following the procedures established for batch input as closely as possible. However, the characteristics of the two input devices will cause some differences in the input procedures. The primary responsibility of TSP will be to structure the on-line input data to a processing format for use by Data Management and the application programs. The TSP will also provide the capability to display records residing on the data base via the CRT. Records requested for display will be retrieved from the data base via Data Management and formatted by TSP into pages, with each page containing all information that can be displayed on the CRT screen at one time.

Data Management.—Data Management is a file management system. All logical processing for control of the data base operations is collected in one area.

Initially, access to the data base will be by LC card number. Provisions will be made at a later date to include access to the data base by other entry points, e.g., by title, author, etc.

The user application programs will communicate to Data Management by means of an interface logic which consists of a number of macro instructions. The macros will provide Data Management with information required to add, retrieve, delete, and replace records.

Data Management consists of two major components. The first component, Structure and Process Utility for Disk Storage, will organize data for storage and retrieval based on the physical attributes and operating characteristics of the direct access storage device. The second component, Hash Indexing for Track Storage, will provide the indexing function for a file organized by Structure and Process Utility for Disk Storage. The hashing technique is supported by a search function to insure that if a record or available disk space exists anywhere in the file, they can be located.

Applications.—Rather than being a component of MUMS, application programs are considered users of the services provided by MUMS. In general, the logic in the application programs will only be concerned with their particular functions and the interface with the services provided by MUMS. An application will be composed of a number of programs, which will be further divided into modules (a program could also be composed of just a single module). Segmenting of the applications programs will be largely dependent on the logical and functional breakdown of the application function and on the core requirements imposed by the system since no module may be greater than 4K bytes in core size.

Before the application program receives a transaction record for
processing, the data have been processed by the ECF of Task Management and by either BSP or TSP of Message Control. The transaction record received by the application program will be formatted in the LC MARC processing format with control elements (i.e., processing and status indicators, transaction type, etc.) appended.

An application function may provide diagnostic output to either a terminal or a file for off-line printing. The diagnostic output will inform the user of the status and the results of processing a transaction record against the bibliographic file at various stages of the jobstream. The application function will generate the output data record and issue a request to ECF which is then responsible for the routing of the record to the appropriate program, BSP or TSP of Message Control. The physical output of the record is then completed by either BSP or TSP.

The application programs will utilize the services of Data Management for file maintenance. Requests will be made, via macro instructions, to Data Management to add, retrieve, delete, or replace a record on a given data base. The application programs will also provide the search arguments, e.g., LC card number, author's name, etc., to Data Management to process the request.

As mentioned in the section on the master guidelines, MUMS constitutes an integral part in future automation efforts in technical processing. Initial applications of this system include on-line correction procedures in creating MARC records and on-line input and access to the Process Information File.

**Order Division Automation**

Automation of selected procedures in purchasing material at the Library of Congress began in 1969. Successful completion of this project will be achieved with the implementation of the following tasks: (1) automated preparation of regular orders (orders for individual titles) and new continuation orders; (2) development of permanent computer files and on-line recording of order status and location; and (3) an automated fiscal control subsystem including the on-line recording of accounting data for each order.

Task 1, which was implemented in February 1971, provides the Order Division with the following computer-produced outputs: purchase orders for regular orders and new continuation orders; dealer slips for all titles being ordered; Order File slips; reports to recommending officers on titles ordered; 3x5 cards for the Process Information File; punched encumbrance cards; Encumbrance File records; updated vendor and ship-to (the unit in the Library to which the items should be shipped) directories; diagnostic messages resulting from the automatic editing of order records; and additional 3x5 cards containing order information for internal use in the Order Division.

New order information from recommending officers is typed daily on IBM 2741 typewriter terminals that are on-line to the computer.
controlled Administrative Terminal System (ATS), an IBM text-editing system. The ATS provides the terminal operators with extensive text editing capabilities that permit on-line corrections of data before submitting them to the Order Division programs for processing. During this keying operation, new order data are transferred to the ATS on-line disk storage. Each night, the ATS order information is transferred to magnetic tape and becomes the basic input file for the Order Division computer processing programs. Permanent computer files developed in Task 1 include the vendor and ship-to directories on disk storage, and the most recent ATS input tape files and tape files of the printed and punched output.

Task 2 is scheduled for completion in February 1972 and will result in the establishment of additional computer files. Foremost of these files is the Preliminary Bibliographic File (PBF) which is a master file of all titles in process in the Order Division. Each PBF record contains complete processing information for a title, including its status and location. A reference file called the system tables will be accessible to any of the computer programs and will contain dynamic data such as country names and codes, currency exchange rates, and standard abbreviations by language for common words used in titles.

Status change transactions for orders will be entered and stored on-line through several IBM 1031 terminals in the Order Division for batch processing by the system each night. Each status change is maintained in the master PBF record until four weeks after the material is received and paid for or the order is cancelled. The record is then transferred to the Archives File.

The following additional printed and punched outputs will be produced upon completion of Task 2:

1. In process lists (IPL): two weekly reports (one in author/title sequence and one in title/author sequence) listing key data fields for all outstanding orders in the PBF. Daily supplements will reflect additional orders and changes (other than status) to existing orders since the last full IPL.
2. Order status change report: a daily listing reflecting the latest status for each order and the date it was changed to that status.
3. Archives listing: a monthly listing of orders received and paid or cancelled in the Archives File.
4. System tables listings: a printout of any or all of the system tables.
5. Delayed processing reports: a weekly listing of orders delayed in any of the Order Division units.
6. Order cancellations: forms sent to a dealer to cancel an order.
7. Order follow-ups: forms sent to a dealer to inquire about the status of an outstanding order.
8. Process control cards: punched cards used by the Order Division to report status changes for an order through the IBM 1031 terminals.

* 220 * 

Library Resources & Technical Services
Task 3, scheduled for completion in 1973, will automate the fiscal procedures in the Order Division. This will involve implementing detailed procedures for recording and reporting fiscal information in machine-readable form and developing the necessary computer programs to process such data. Fiscal data will be recorded on IBM 1050 terminals on-line with the computer, and calculations and error-checking of the data will be performed immediately. Answers to the calculations and diagnostic messages are returned to the terminal operator so that he can verify and correct the information while the source records are at hand. In addition to saving time, this on-line input will help to prevent errors from entering the fiscal system.

Information about dealer invoices, including the current status of each invoice, will be maintained in the Invoice Control File. The Invoice Control File will be used to prepare payment documents, invoice control reports, and fiscal statistical summaries for both internal and external distribution.

Redesigning and expanding existing programs to handle old continuation orders are scheduled after completion of Task 3. Detailed analysis and design specifications have not yet been prepared, but approximately 25,000 continuation records will have to be converted from the current master continuation file format (where title statements are now truncated) to the format used in the Preliminary Bibliographic File.

Process Information File

The magnitude of acquisitions and cataloging operations in the Library of Congress requires a division of the work among several divisions and hundreds of staff members and results in tens of thousands of items being in process at any one time. Moreover, because of the volume of material being handled, it is inevitable that many items remain in process for long periods. Without some means to determine whether a particular title is in process and, if necessary, where it can be found, the normal business of the Library could not be carried out effectively. The Process Information File (PIF) exists to fill this need. By recording individual titles that are on order or have been brought under preliminary control, PIF serves the following functions:

1. Preventing unintentional duplication in acquisitions.
2. Preventing duplication of original cataloging of additional copies of the same work.
3. Locating a particular title so that its processing can be accelerated or so that it can be used immediately.
4. Locating in the collections a fully cataloged item that is not yet represented by a printed card.
5. Recording, before receipt of a title, that it is to be given priority handling and routed to a particular division (for instance, the Loan Division).

The ability to satisfy these needs to a large extent makes PIF an essential adjunct to the Official and Main Catalogs.
This section describes a preliminary design of how an automated Process Information File might work. This design builds on the analysis performed during an earlier investigation of the potential of such a project for the Library of Congress. The automated PIF will be an on-line system designed as an application operating within the MUMS system.

An automated PIF would eliminate the problem of maintenance, and the flexibility of the format for the machine-readable PIF records would allow access to the file by a number of entry points, provide accurate and up-to-date status information, build the foundation for the full MARC record, provide an improved selective dissemination of information service to LC staff members, and provide a prototype for a machine bibliographic file subject to heavy use for a variety of purposes. At this stage, basic design still remains to be done on particular aspects of the system, and detailed analysis may well affect many of the elements described. Although specific procedures and pieces of equipment have been named to facilitate description of the preliminary design, all may be subject to change on the basis of later work.

Input to PIF will include all languages; entries for non-Roman titles will be in the form of skeletal records. The volume of retrospective conversion required will be relatively small since the file is dynamic and the records are purged when printed cards are filed in the Official Catalog.

Automation of the PIF function does not imply that all of the cataloging process will be automated. LC cataloging is a sequence of operations, i.e., preliminary cataloging, descriptive cataloging, subject cataloging, classification, and shelflisting. The manuscript card (cataloging worksheet), which is used to record cataloging information and to provide copy for printing catalog cards by the Government Printing Office, will be an output of the PIF system. It will accompany the title as it progresses through the remainder of the processing cycle.

Although not explicitly described in the remainder of this section, a unique function code is associated with each procedure in the machine system. A function code is actually a command to the machine system which results in certain defined actions. The possibility exists that a function code defined to perform a certain action has within this action several alternatives. These alternative commands have been termed subfunction codes.

When a title is received in the Preliminary Cataloging Section, a query will be made against the PIF to determine if the title is in process. Searchers stationed at a CRT terminal will initiate the query by typing the file identification code and record identification code (search key). In order to reduce the number of input characters required to identify a work, an abbreviated search key will be used. At the present time, consideration is being given to the use of the search key developed at the Ohio College Library Center. This key is composed of the first three characters of the author's name and the first
three characters of the title (deleting nonsignificant words such as initial articles).

When this message is received by the system, the search key will be used as the argument to scan the PIF directory file for all records which satisfy this search key. A PIF abbreviated record consisting of a two-line entry will be displayed on the CRT for each of these records. These two-line entries will contain the PIF record identification number, the first 35 characters from the title, the first 8 characters from the collation field, the first 30 characters from the main entry, and the first 37 characters from the imprint. If any field contains fewer than the specified number of characters, blanks will be used as fill characters. The arrangement of elements has been tentatively chosen to make maximum use of the display space.*

The terminal devices presently under consideration have the capacity to display approximately five of the PIF abbreviated records at one time. The heading of a display will contain the search key used and the number of records in the file that match the search key. The user will also be able to display any one complete record by keying the PIF record identification number. Each display of a complete record includes the number of screens (pages) of data required to display the entire record since a record may exceed the capacity of a single display. The user may elect to have previous, subsequent, or any specific page displayed or, alternately, to restore the display of abbreviated records in order to select another complete record.

When a title is new to the Library, the preliminary cataloger will indicate that original input is required. In response, a "null" record

*The preliminary determination of the number of characters allowed for each element was based on character counts of MARC records.
will be displayed for entry of the bibliographic data into appropriately labeled fields as shown in Figure 3.

Upon indicating completion of the bibliographic record, a PIF record identification number is generated for the record by machine, and the record is stored in the PIF file. An entry is also made into the PIF directory file in order to expedite subsequent retrieval of the specified record. When the record has been successfully stored in the file, the message "PIF NO. XXXXXX HAS BEEN STORED" will be displayed on the screen.

Records created by preliminary catalogers must be reviewed and possibly revised prior to output of the cataloging worksheet and forwarding of the item for descriptive cataloging. A list containing a brief entry for each record created by the preliminary cataloger will be printed on an IBM 1053 typewriter. The reviewer will request the display of each of the bibliographic records specified on the list by typing the PIF record identification number. If there are no corrections to be made to the record, the reviewer will approve the record, and it will then be written on a temporary file for subsequent hard copy output. If an error exists, the reviewer can correct the error at the console and the record will be corrected on the PIF file and then the corrected record will be written on the temporary file.

When the reviewer has completed all titles in a given batch, he will request the system to print a cataloging worksheet and to punch a card with the PIF record identification number (PIF ID card). Both worksheet and punched card will accompany each title through the cataloging process. The punched card will be used to register the status of the work as it is processed. Present thinking calls for an IBM 1050 station with a punch and a printer located in the Preliminary Cataloging Section to perform this function.

Upon completion of the printing of the cataloging worksheets and the punching of the PIF ID cards, the preliminary cataloger will match the book with the appropriate worksheet and punched card. This package will be forwarded to each work station in turn throughout the remainder of the cataloging process.

Upon receipt of an item by each subsequent station, that station will place the PIF ID card and prepunched cataloger identification card into an IBM 1031 card reader, and the information will be transmitted to the computer along with the location of the station (extracted from the terminal) and the date of receipt (generated by the computer). Location, cataloger identification, and date of receipt will be added to the PIF record.

After a work has been processed by a station, the PIF ID card and the cataloger's identification card will again be entered into the IBM 1031 card reader. The location and cataloger's identification will be matched with the information already in machine-readable form in the PIF record, and the date of release will be generated by the computer and posted to the record. This posting of location, cataloger

• 224 •

Library Resources & Technical Services
identification, and date of receipt and release takes place at each station throughout the processing continuum as information is added to the bibliographic record on the cataloging worksheet in a manual mode. The data contained in the PIF record now provide the necessary information to query the system for the location of a title in process and the identification of the individuals who handled the item.

After the item has left the Preliminary Cataloging Section, one or more major access points to the record such as main entry or title may be changed in the cataloging process. Should this occur, the cataloger will make the change on the cataloging worksheet and also record the change on a correction sheet by PIF record identification number. The correction sheets will be sent back to the Preliminary Cataloging Section for modification of the machine-readable record, but the corrected cataloging worksheet along with the item will continue in the processing stream. Corrections to the record other than entry or title will be made on the cataloging worksheet but will not cause a modification of the machine-readable record at this point in the process. These changes will be recorded when the PIF record is updated to reflect full cataloging data at the end of the process in the MARC Editorial Office.

Since the PIF record is the only record for a title until the machine-readable record is updated to become a MARC record and until a printed card for the title is filed in the Library's catalogs, the call number must be posted to the record in order to have access to the physical item on the shelf. Therefore, there will be a terminal in the Shelflisting Section to post the call number to the PIF record.

As titles proceed through the cataloging process, they may have to be put into an arrearage for a variety of reasons. In the automated PIF, the system is informed in the same way as other status reports are made, e.g., instead of the Preliminary Cataloging Section sending a title for immediate descriptive cataloging, it is sent to an arrearage. This action is posted to the PIF record. Removal of an item from an arrearage for further processing will likewise be reflected by the posting of location, cataloger identification, and date.

Once a work has been completely cataloged, the record for that item will follow one of two possible paths:

1. If the title meets the criteria of form of material and language for MARC (at present, English language monographs), the record will be sent to the MARC Editorial Office. A MARC editor will request the PIF record for the item, update the existing machine-readable record for additions and corrections that appear on the worksheet, and release the record to the MARC Data Base. All records in the MARC Data Base are sent to the Card Division to produce printed cards via the computer and the VideoComp (photocomposition device) for the Library's catalogs. These machine-readable records are stored for subse-
quent orders and printing of cards in response to orders from outside institutions.

2. If the title does not meet the MARC criteria for inclusion, the cataloging worksheet is sent to GPO for manual typesetting of the printed card.

In either case, once the printed card has been filed in the Library's catalogs, the record will be purged from the active PIF file. Those machine-readable records that are not entered on the MARC Data Base will probably be stored on tapes until further analysis determines their future potential for the Library's automation program.

**Subject Headings Project**

Since the publication of the seventh edition of the LC subject heading list, that data file and each supplement file have existed in machine-readable form. However, because these machine files were in a publication format which included such elements as font change indicators, spacing and line indentation codes, and various other information necessary for formatting and printing, the data were virtually unusable for such tasks as correcting errors or adding new headings. Neither could the data be used for any type of publication or report other than the seventh edition and its supplements.

In order to make subject heading authority data more useful in a variety of ways, the MARC Development Office has undertaken a project with the following objectives:

1. To reformat the existing data into a MARC format for subject headings.
2. To consolidate the existing files for the seventh edition and supplements into a single master data base.
3. To develop a file maintenance and publication system which would enable the Library of Congress to publish future editions as required.
4. To provide an interface with the MARC processing system which would allow machine utilization of the subject heading authority file.

A MARC format for subject headings was designed to simplify the complex interrelational structure of the subject heading data within the machine file. The format utilizes the LC MARC processing record structure consisting of the following: a 12-character leader, a 12-character communications area, a fixed field area, a variable number of 12-character directory entries, and a variable length data area.

The tagging structure parallels the MARC formats as closely as possible. The tags for headings and subdivisions are exactly like the MARC subject entry tags, which include 600 for personal name, 610 for corporate name, 650 for topical, etc. Data elements such as references, tracings, and notes were assigned tags in the 6XX series which are not used in MARC such as: 660 a see-also reference, 670 a see (x) tracing, 680 a
see-also-from (xx) tracing, and 695 a class number associated with a heading.

The logical record structure of the subject heading machine file differs markedly from the organization of the printed volumes. The printed volumes arrange headings and their related subdivisions, tracings, and notes in a strict hierarchical way, which clarifies the interrelationship of the elements. Various lines under the heading “Art” will serve as an example.

Art (Direct) (N)
  sa Action in art
  −History (N5300-7415)
  −Juvenile literature
  −20th century (N6490-6493)
    sa Modernism (Art)
    x Modern art
    xx Modernism (Art)

In the subject heading file, a separate record is created for each element in the published edition except for the LC class number and the terms Direct and Indirect, which are included in the record for the heading to which they relate. In order to maintain the records in the correct filing order, each record which contains a nonheading element must also contain the heading elements to which it is related. This will be clarified by showing the contents of each of the records in the example. Indicators and subfield codes are given as they appear in the subject heading processing format. Actually, in a MARC record, the tag identifying each variable field is carried in the directory and not in the field it identifies. The hyphen in an indicator position designates a null condition.

1. Heading: Art (Direct) (N)
   One record containing the following variable fields:
   [650]-0*a+Art
   [695]a+N
   The Direct descriptor will be represented in a fixed field.

2. See-also reference: Action in art
   One record containing the following variable fields:
   [650]-0*a+Art
   [660]-0*a+Action in art

3. Subdivision: History (N5300-7415)
   One record containing the following variable fields:
   [650]-0*ax+Art+History
   [695]a+N5300-7415

4. Subdivision: Juvenile literature
   One record containing the following variable field:
   [650]-0*axxtArt+History+Juvenile literature
5. Subdivision: 20th century (N6490-6493)
   One record containing the following variable fields:
   [650]-0@axy†Art†History†20th century
   [695]-a@N6490-6493

6. See also reference: Modernism (Art)
   One record containing the following variable fields:
   [650]-0@axy†Art†History†20th century
   [660]-0@a@Modernism (Art)

7. See reference: Modern art
   One record containing the following variable fields:
   [650]-0@axy†Art†History†20th century
   [670]-0@a@Modern art

8. See also from (xx) reference: Modernism (Art)
   One record containing the following variable fields:
   [650]-0@axy†Art†History†20th century
   [680]-0@a@Modernism (Art)

Once the subject heading data are in this new format, the files can
be corrected and merged using the computer processing system which
is currently being implemented.

The correction process includes two updating programs. The
first program will correct data and tagging errors while the data are in
the present filing order (that is, the arrangement of the seventh edi-
tion). On completion of the initial update, the file will be sorted into
a new filing order, described in “Filing Arrangement in the Library of
Congress Catalogs” elsewhere in this issue. The second update program
will then be used to add any new records and to do any final correc-
tions.

From this point, the subject heading file will be maintained in the
new filing order. Although this arrangement will make the main-
tenance procedures more complex, it will save the cumbersome and
time-consuming process of sorting the file before each publication.
Since most of the management problems in the file will be related to
filing, it should be possible to resolve these problems more easily by
maintaining the data in filing order.

When the master file and all the supplements have been corrected
and are in the proper order, the merge will take place. It will consist of
continuous merges of the supplements with the existing seventh edition
master file. Each merge will be verified to insure that the filing order is
maintained correctly. The result of this merge will be a subject head-
ing master file from which an eighth edition could be published. All
future editions and supplements, although maintained by the Library,
will be published via the Linotron, a photocomposition device used by
the Government Printing Office.

Once the existing files are merged, updating of the master file will
be done on an annual basis. Input of updating transactions will be
done on the Administrative Terminal System (ATS), which will en-
able the typists to create error-free transactions. The update transactions will be converted to the subject heading processing format and added to a cumulative supplement tape. The supplement tape will go through publication processing programs four times each year in order to issue the quarterly cumulative supplements which update the published edition. Once the fourth supplement is published, the year's accumulation of supplement transaction records will be used to update the machine file. At that point, the master file will be completely up-to-date and can be published as required.

As soon as a fully merged subject heading data base and an ongoing maintenance and publication system exist, the problem of more meaningful use of the file will be addressed. In view of the usefulness of an up-to-date subject authority list to the library community, it would be worthwhile to consider the possibility of developing a distribution service for this kind of data, but it is not clear at this point exactly how such a service would function. Within the Library, present plans call for development of a system of on-line access to aid subject catalogers in their day-to-day work with the subject heading file. At the same time, an interface with both the core bibliographic system and the book catalog system is anticipated. This total integration of the subject heading data base into the technical processing continuum forms a part of the long-range plans to create an efficient, multipurpose bibliographic system.

**Library Sort Key Edit Program**

**Introduction.**—The ability to arrange bibliographic entries by computer in an efficient manner depends on a consistent set of rules for arrangement, a machine-readable format that affords adequate identification of key elements in a catalog record, and a flexible program for building sort keys that can be processed by a sort/merge program. The Library of Congress has undertaken to achieve this capability for its own purposes by developing a more consistent approach to filing arrangement and by designing and implementing a computer program to process records in the MARC format.

The proposed LC filing rules are described elsewhere in this issue.* Although they are intended primarily to obtain arrangements that are relatively easy for humans to achieve and to use, the final test of the practicality of a rule was whether a computer could be programmed to apply it efficiently. Clearly it was not possible to make such a decision without considering the other basic components of a machine filing system. This was done by taking account of the content designators (tags, indicators, subfield codes) in the MARC format, the capabilities of the SKED (Sort Key Edit) program developed by the Library, and preliminary analyses of the possibility of developing algorithms to im-

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**Volume 16, Number 2, Spring 1972**
plement various specifications of the rules.

When all of these factors were considered, it seemed quite feasible to program the rules for computer filing with relatively little dependence on manually supplied sort keys. Using the rules as a foundation, the MARC Development Office and the Technical Processes Research Office have cooperatively developed an expanded version of SKED called LIBSKED (Library Sort Key Edit), which is described in this section.

Characteristics of LIBSKED.—Data to be regarded in machine sorting must be placed in a special field (called a sort key) near the beginning of a record so that it can be accessed easily by a manufacturer's sort/merge utility package. A sort key can be attached to a record permanently, or it can be built on demand when the record is to be sorted. The second alternative has the advantage of greater flexibility in specifying what fields are to be included and how they are to be arranged. The original SKED program was written to accomplish this task for MARC records. Its capabilities form the core of the new LIBSKED program.

The sort key building is activated by a set of control cards supplied by the user. These cards specify the conditions (parameters) to be observed in processing each MARC record. Using this information, the program reads each record, builds as many sort keys as are required to satisfy the parameters, and duplicates the original record for later use. The output is an intermediate MARC sort file containing records with sort keys. This file is sorted by the IBM S/360 OS tape sort/merge program and merged by a routine written expressly for SKED and LIBSKED.

Before data characters are moved from a designated field in a MARC record to a sort key, they must be edited to ensure that the key includes only those characters relevant for sorting. It is necessary also to insert special characters at strategic points to ensure the desired arrangements. The first of these tasks is accomplished by translating the data characters into the LIBSKED character set. The second is accomplished by subroutines triggered by MARC content designators and algorithms associated with them. The following sections describe these features of LIBSKED.

Basic Sorting Sequence. The basic sorting sequence for characters is, in order of precedence, the hierarchy of superblanks (see below), the blank, Arabic numerals 0–9, and the letters of the English alphabet A–Z.

Translation Table. The translation of data characters into the LIBSKED character set is controlled by a table in the program which can be changed without programming complications. The translation process has the effect of: (1) equating upper- and lowercase versions of the same letter; (2) treating certain marks of punctuation (e.g., the hyphen) as a blank; (3) preventing other punctuation, diacritics, and
certain special characters from being moved to the sort key; and (4) ensuring the proper machine collating sequence. The LIBSKED character set also provides bit configurations for superblanks.

Safeguard Against Superfluous Blanks. The program provides safeguards so that two blanks may not occur together, and no subfield may begin or end with a blank or a combination of a blank and a superblank.

Leading Elements. A filing entry consists of all fields that may be considered in determining the filing position of an item in a catalog; for example, an author heading, title, and imprint date. A field may be divided into subfields or elements that make up an integral part of the field (e.g., a subdivision of a subject heading; a surname in a personal name heading). A subfield or an element may include more than one word. The first element of a field is called the leading element. In a given instance, the leading element, the subfield, and the field may be identical (as occurs in a title).

The end of the leading element of each field in a filing entry must be located so that a superblank can be inserted to distinguish the leading element when it is grouped with other identical leading elements that signify different entities (e.g., as occurs in a file under London). The leading element is found by searching a field for significant characters such as a comma followed by a blank and an uppercase letter, a left parenthesis, and end-of-subfield and end-of-field characters.

Superblanks. A superblank is a special character that sorts lower than (in ordinary parlance, before) a blank. Different superblanks are used to mark the end of a subfield and the end of a field, and to differentiate identical leading elements so that they can be arranged correctly. Broadly speaking, superblanks are used in the sort key to preserve filing distinctions indicated by punctuation in the original data.

Since superblanks cannot be shown graphically, they are indicated in the following example by marks of punctuation.

<table>
<thead>
<tr>
<th>Type of entity</th>
<th>Original data</th>
<th>Sort key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person</td>
<td>George, Gladys.</td>
<td>georgetgladys*</td>
</tr>
<tr>
<td>Place</td>
<td>George, Ariz.</td>
<td>georgeariz*</td>
</tr>
<tr>
<td>Thing</td>
<td>George (Yacht)</td>
<td>george/yacht*</td>
</tr>
<tr>
<td>Title</td>
<td>George.</td>
<td>george*</td>
</tr>
</tbody>
</table>

At present, LIBSKED provides 43 different superblanks to make the distinctions required by the proposed LC filing rules. Although the program was written to implement these rules, it would be possible to produce somewhat different arrangements by changing the number and relationship of the superblanks. This could be done without major reprogramming by modifying the table from which the superblanks are assigned.

Initial Articles. When a title or series field (MARC tags 240, 241, 245, 440, and 840) begins with an article that is to be ignored in filing,
the second indicator contains a value equal to the number of characters to be omitted at the beginning of the field when building the sort key. This value is set during the original creation of the MARC record. Other fields beginning with an initial article to be ignored have to be linked with a special filing field (tag 880).

Numerals. If a numeral is detected or a “d” (date associated with a person) or “y” (chronological subject subdivision) subfield code is identified during the building of the sort key, LIBSKED branches to a special subroutine. Numerals encountered anywhere other than a “d” or “y” subfield are converted to a standard number format (a full-word binary number preceded by a value that is lower than that of the letter A and higher than that of a blank). This routine also makes special accommodation for decimal numerals, and subscript and superscript numerals.

When a numeral is followed by a bracketed phrase (e.g., 4 [i.e., Quatre] contes), the data between and including the brackets are excluded from the sort key. Roman numerals in a personal name field (e.g., as in Louis XIV) are to be converted to the standard number format according to their Arabic value.

Subfields “d” and “y” are processed as follows:
1. When numeric data are present, all other data are ignored in building the sort key. If no numeric data are present, the data in the subfield are used as is unless a special filing field is indicated.
2. An A.D. date is added to 5000 and converted to the standard number format. The algorithm for processing dates was based on the one used in the New York Public Library sort key program.
3. A B.C. date is subtracted from 5000 and converted to the standard number format.
4. A date given in terms of century (e.g., 19th century) is processed as a 100-year span. For example, 19th century in a “y” subfield would be put in the sort key as 6800 6899 (derived from 1800+5000 and 1899+5000).
5. A date preceded by the word “To” in a “y” subfield is processed as if it were 0 to date (e.g., To 1800 becomes 0000 6800 in the sort key).

Call Numbers. Call numbers are divided into discrete parts (e.g., class letters, class numbers) and each part is padded with zeros to the maximum size of that part. This alignment is necessary to arrange call numbers in shelflist order.

Special Filing Fields. When the data in a field cannot be processed properly for filing by any of the LIBSKED editing subroutines, a special filing field (tag 880) must be supplied by a human editor. For example, when the heading The Club occurs as a main entry (tag 110), an 880 field containing only the word Club must be included in the record because there is no free indicator position to meet the requirements of the initial article routine. The 880 field is linked to the

• 232 •

Library Resources & Technical Services
original field so that its presence can be detected by LIBSKED.

In view of the proposed LC filing rules and the editing routines provided by LIBSKED, it is anticipated that only two percent of all MARC records will need special filing fields. Their number could be reduced still further by changes in the form of certain name and subject headings.

Computer Requirements. LIBSKED is a modular, table-driven program written in Assembler Language Coding for an IBM 360/40 operating under OS. The program requires 70K bytes of core storage.

Conclusion.—The successful operation of LIBSKED demonstrates that the content designation of data elements in LC MARC records generally provides the information needed to build complex sort keys from the original data. When tags, indicators, and subfield codes are not sufficiently explicit, the data can be analyzed in a straightforward way to make the necessary distinctions. Only a tiny percentage of the records will require special filing fields.

Although LIBSKED is still undergoing refinement and testing, it provides a basic capability for arranging bibliographic entries according to sophisticated filing rules. It will be given its first practical application in the production of the computer-produced catalog of motion pictures and filmstrips.

Book Catalogs

Production of a catalog involves three basic procedures: (1) creation of bibliographic records and references; (2) sequential arrangement of them or their surrogates according to some system; and (3) display of the arranged records for the user, e.g., by book, drawer of cards, microform, or cathode ray tube. Although book catalogs lack flexibility, they can be made widely available at a reasonable cost. Thus, they have always had an important place in the bibliographic services of the Library of Congress.

The printing of book catalogs at the Library of Congress began in 1802 with a ten-page octavo pamphlet. The bulk of the Library’s more recent book catalogs have been produced by photographing its printed cards. Typed cards for cross-references and reports from other libraries are interfiled with a special “edition” of cards printed with no top margin and no leading between the last note and the tracings paragraph. These cards are then attached to large pieces of cardboard, photographed, and then removed and saved for the next cumulation. This method greatly reduces proofreading since the text of the printed card is unchanged. Monthly, quarterly, annual, and quinquennial catalogs create, however, a filing requirement of truly heroic proportions.

Since a MARC record is a computer-manipulable analog to the printed card, its use in the production of book catalogs offers a way to shift the burden of arrangement from man to the machine. Another virtue of machine-readable records for book catalog design is freedom.
from the unit card. To the extent that portions of a record are separately identified, they can be separately excluded, arranged, displayed, etc. Thus experimentation in book catalog production is an important aspect in the automation of technical processing. The following sections describe the input and output phases of two current projects; machine filing is discussed in another section of this article.

Main Reading Room Reference Collection.—This collection comprises approximately 10,000 monographs and 4,000 serial reference works shelved in alcoves around the principal reference room of the Library. When the Reference Department proposed that a book catalog for this collection be produced by computer, it offered an attractive challenge for several reasons:

1. The records were in a variety of languages.
2. Printed cards for the collection reflect the problems posed by older cataloging styles—problems requiring investigation as part of a study of conversion of retrospective catalog records.
3. The records for serials will provide a good test of the MARC serials format.

Each of these factors raises questions concerning input. In some cases, only a simple decision was required, e.g., phrases such as “Half-title;” before a series statement should be omitted. With problems such as “dashed on” supplements and records with non-Roman characters, new procedures were required. Dashed-on supplements were converted into notes beginning “Includes . . .,” and a code designating this change was inserted in the modified record fixed field. Since the ability to input, store, sort, and display non-Roman characters is not yet on the MARC horizon, a compromise was necessary. Since transliteration of all non-Roman characters would have involved excessive editorial effort, non-Roman characters for which the transliterated form was available on the printed card, e.g., the short title, were given in their transliterated form. All other non-Roman characters were omitted. This meant that the body of the entry was frequently abridged to the short title and the imprint date. As with supplements, the modified record fixed field was used to flag the record as incomplete.

Because the reference librarians wanted extra subject headings and “catch title” added entries included in the catalog, special tags were provided to allow them to assign extra fields to the records.

Plans call for the Main Reading Room catalog to be in four sections arranged by call number, author, title, and subject. The call number section will have the most complete records, including all notes and subject tracings but excluding added entries, national bibliography and overseas acquisition numbers, Dewey numbers, series tracings, price, and cataloging source. The other three sections will have briefer entries consisting of author, title, edition, imprint, pagination, call number, and location. Initially, the catalog will be printed in three columns via computer line printer on offset masters. Eventually the catalog
may be printed via photocomposition devices for general distribution.

As of December 1971, more than 8,800 of the monographs have been converted, and the editing and correcting of the remainder and the serial entries are in progress.

A similar project involving the reference collection of the Science reading room, which is in progress, contains 4,000 monographs and 750 serials. The final catalog will be much like the one planned for the Main Reading Room. Editorial work in the conversion of this data base was performed by the Science and Technology Division.

**Motion Picture and Filmstrip Catalog.**—The first MARC-based book catalog to be published by the Library will be the motion picture and filmstrip catalog. (The Main Reading Room catalog is considered an in-house experiment.) Two facts determined its selection: the catalog is small with approximately 9,000 records per year and, therefore, of a manageable size for our first experiment in photocomposition of book catalogs; and the paucity of diacritics and the almost total absence of non-Roman characters mean that the quality of the current catalog need not be reduced because of the limitations of photocomposition technology.

A MARC format for films has been designed and published. Specifications for its implementation have been written, and modifications to the programs used to input monograph records are being made. An editor’s manual showing how to edit film records for the computer is being written. Actual editing should begin early in 1972.

Since this catalog contains see and see-also references, a provisional format for such references was also designed. Initially, the same procedures for handling references in the manual system will be followed. The Catalog Publications Division will send data for these references to the MARC Editorial Office as required. This is only a short-range solution because time did not permit development of the optimal automated name authority file.

The format of the photocomposed catalog will be virtually the same as the present one except that the references will be in the same typeface as the bibliographic entries.

These book catalogs will be composed, printed, and bound by the Government Printing Office. This means that the sorted records in the MARC format must be translated into a printing format before input to the GPO master typography program which controls the composing device, a Linotron 1010. A full explanation of photocomposition will not be attempted here, but in essence, a magnetic tape with the text to be printed and certain imbedded typographic commands generates photographs of hyphenated and justified pages containing the desired type sizes and fonts. Printing and binding will not differ from the present procedures.

The program to convert the MARC tapes and insert the typographic commands is being written by a contractor under supervision.
of the MARC Development Office and Information Systems Office. This program will accept a variety of input formats (MARC and the Information Systems Office’s logic library format) and can vary the output as specified in a series of parameter cards. The program is intended to be sufficiently general so that the difficulties of automating the printing of additional publications will be minimal.

At least initially the catalog pages from the Linotron will require rigorous proofreading to verify the reliability of the output processing described above. After a few “shake-down” issues have been printed successfully, proofreading of sample pages may suffice. The input records will, of course, always be proofread. While corrections can be “stripped” on the computer-composed pages, this means that the correction must also be inserted in every subsequent cumulation containing the record. Naturally, in the long run, the better course of action is to determine the cause of the error (is it a faulty record or a faulty program?) and to correct it. Experience with the Linotron may alter this opinion.

Long-Range Possibilities.—A discussion of automating book catalog production at the Library of Congress would be incomplete without mentioning the register/index idea. This concept eliminates the redundancy of the current catalogs; before an average card appears in a quinquennial cumulation, it has already been printed 2.3 times in monthly, quarterly, and annual issues. This alternative format of the catalog would avoid this repetitious printing. Each full record would be printed once in the register which would be arranged by sequential “dummy” number. This register would never be reprinted. Revised cards would have a new “dummy” number. Separate indexes arranged by author, title, subject, and perhaps call number would contain briefer entries and refer to the latest dummy number for the full record. The indexes would be cumulated in a pattern similar to the present catalog. Determination of what information to include in the index entries requires that the economies of brevity be weighed against the costs of reference to an additional volume if the needed data are not present in the index. The diverse uses of the Library’s catalogs—locating copies of obscure books, subject searches, ordering books and catalog cards—renders this decision extremely difficult. In any case, use of smaller type and a different layout in the indexes would permit many more entries per page than can be accommodated in the present catalogs. The register/index concept is somewhat analogous to the present National Union Catalog of Manuscript Collections and (if its indexes were cumulative) to the Monthly Catalog of U.S. Government Publications. This idea is still being investigated.

Card Division Automation Program

The Card Automated Reproduction and Distribution System (CARDS) is nearing completion. Phase I, consisting of automated order handling and inventory control, has been operational since 1970.
Approximately 40,000 orders are being received each day; of these, over 75 percent can be filled in an average of seven working days. Approximately 6 percent of the orders received represent preassigned card numbers for which cataloging copy is not yet available, and the remaining orders represent titles which are out-of-stock and are filled with reprinted stock, or cards produced by offset reproduction or a photocomposition device.

Phase II of this project consists of producing printed cards by the VideoComp, a photocomposition device, from machine-readable records in the MARC Data Base. This eliminates the need to maintain card stock for these records. Because of delays in the delivery of Phase II software and the necessity to implement a number of modifications in the system, “loading” of records from the MARC Data Base was not begun until July 1971. Averaging one eight-hour shift per 5,000 records, the complete formatting and storage of 200,000 card titles took slightly more than six weeks.

Modifications were necessary in order to correct errors noted on test runs and to handle new information to be printed on the catalog card. Original specifications provided to the contractor were also updated with various changes.

The complete Phase II configuration for filling orders on demand has been in operation since September 28, 1971, but only on a limited basis. Test estimates show that if all 200,000 records in the photocomposed data base could be accessed, 40 percent of all daily card orders received could be filled through this system. Currently, however, only 9,200 titles for out-of-stock cards or 10 percent of the daily orders received are being filled through this system because of limitations in the capabilities of the offset press and accompanying cutting and collating equipment. As problems with this part of the operation are resolved and as the press together with the cutting and collating machine can produce large quantities of cards with consistently high quality, the number of orders processed through the Phase II system will be allowed to increase. The emphasis will then be shifted from filling out-of-stock cards on demand to filling new titles on demand.

The standard format of the LC printed card is the only one that is maintained in a precomposed form and, thus, is the only format used for cards distributed to subscribers. However, overprinted cards for the Library’s own card catalogs and “special editions” of the cards for the LC catalogs are also produced by the Phase II photocomposition programs. Main entry, added entry see reference, and multiple surname cross-reference cards are produced for The National Union Catalog, and main entry and subject heading cards are produced for Library of Congress Catalog—Books: Subjects. It is anticipated that printed cards for motion pictures and filmstrips will be produced by Phase II sometime in 1972. This is being coordinated with the project to convert records for films to machine-readable form and to produce the book catalog for motion pictures and filmstrips on the Linotron.
REFERENCES


13. Ibid., p.48–49.


24. The manuscript card is used at the Library of Congress to record cataloging information and as copy for printing catalog cards by the Government Printing Office.


Filing Arrangement in the Library of Congress Catalogs

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New filing rules have been developed for the catalogs of the Library of Congress to ease the tasks of filers and users and to pave the way for computer-assisted filing. This article discusses preliminary considerations about the functions of large bibliographic files, the complexities of cataloging, the interaction between users and catalogs, and ways to simplify arrangement. The assumptions and principles that underlie the proposed rules are stated, and their organization and anticipated use are described. An abridged version of the rules is illustrated by an extended example.

Preliminary Considerations

FILING ARRANGEMENT is the capstone of the system of bibliographic control that begins with descriptive cataloging and includes subject analysis and classification. The entire effort to achieve bibliographic control necessarily reaches its fulfillment in the means of displaying catalog information to users. If the arrangement of the file violates the form or meaning of the headings, users will be hampered in their efforts to use the catalog successfully.

Discussions of library file arrangement often begin with an assertion that existing filing rules are too complicated. The discussion then proceeds to the promulgation of rules that are said to be simpler to apply and (presumably) equally satisfactory from the standpoint of locating records in the catalog. Relying on a cry for simplification instead of considering the rationale for the catalog amounts to defining the problem of arrangement in terms of a solution. What is required is definition of the functions of the catalog, the elements of its construction, and the conditions under which it may be used. Only then can the requirements for file arrangement be identified and defined. Unless a frame of reference is made explicit, enormous amounts of time can be squandered in arguing over details when the real differences lie in divergent views of how the catalog is to operate.

The Functions of the Catalog.—At the risk of restating the obvious, it seems advisable to enumerate two prime objectives of catalogs

* 240 *

Library Resources & Technical Services
used in American libraries. The first is to enable users to determine whether a library has a specific book. The second is to group catalog records for works associated with a specific person, corporate body, or anonymous work, and works on a given subject. Unless one wishes to re-examine the philosophical bases of these objectives, they must be acknowledged to be the foundation of the present structure of our library catalogs.

For most American libraries, two cataloging aids are used to achieve these objectives. The Anglo-American Cataloging Rules provide a standard way to construct a distinctive form of name for a given person, corporate body, or uniform title, as well as a means for determining primary and secondary access points in relation to a given item. Subject Headings Used in the Dictionary Catalogs of the Library of Congress (7th edition and supplements) provides established terminology for representing subjects and their various aspects. Both of these aids provide for a reference structure that will lead users from alternative forms to the headings established for use, and one that will link related headings.

The Complexities of Cataloging.—Since library cataloging is intended to describe items in a particular collection, in the actual working situation the Library of Congress formulates new name and subject headings in relation to those already in the LC catalogs. This is an extremely important consideration in the discussion of file arrangement because the enormous size of the catalog (approximately 16 million entries representing an estimated 1.7 million names and 100,000 subject headings) necessitates the construction of complex headings even to approach the goal of a distinctive form of each name and to alleviate the congestion of entries under broad subject terms.

To avoid ambiguity when entries are to be made for persons with identical names, some means must be found to differentiate the names so that the entries can be grouped correctly. This situation occurs to some extent even in small catalogs but it becomes really tortuous in large catalogs. For example, the LC catalog contains headings for eighty-six persons named Müller who have the forename Hans. Of these, thirty-six are distinguished only by other forenames; twenty-seven only by dates; nine only by identifying words; and fourteen by combinations of names and dates or identifying words. In addition, the file contains five references from variants of Müller, Hans, to other forms of this name (e.g., Müller, Hans Meier see Meier-Müller, Hans).

This problem arises not only when establishing personal names but also when determining the forms for corporate bodies, uniform titles, and topical subject headings, which sometimes have to be distinguished from other headings. Since library cataloging always involves establishing headings in relation to the body of existing headings, it follows that they will often contain information supplied by the cataloger. As has been shown, this requirement occurs in an ex-
treme form when headings are established for the entire LC catalog, but even an annual cumulation of the National Union Catalog taken by itself would make demands exceeding those encountered in the vast majority of library catalogs. Thus, it is fair to say that the complexities of catalog headings and their arrangement are not attributable primarily to the rules that govern them; they arise from the varieties of materials being cataloged and the size of the catalog being maintained.

The need to differentiate names in the catalog while still conveying intelligible information about the name results in forms of heading that indubitably present difficulties of arrangement. The fundamental conflict between the function of headings as units of intelligence and their function as filing guides cannot be underestimated, but the integrity of the heading (in its role of conveyer of intelligence) must necessarily take precedence over any attempt to structure it so that it files "automatically." Or, to put the matter succinctly, headings do not exist merely to be filed.

Users and the Catalog.—It is commonly said that, since little is known about how the user approaches the catalog, librarians do not know the best way to arrange catalog entries. This contention appears to be based on the misapprehension that user activity must be quantified in absolute terms before a valid determination can be made. The stress on the user is largely misplaced. To begin with, the user is a myth. In a general library, there are many different kinds of users and even the same individual may approach the catalog in different ways at different times. The important thing is the identification of major categories of uses, and the assertion that they are unknown ignores the cumulative experience of many decades of effective librarianship.

The proportion of a given use may be significant, but it cannot be an overriding consideration if the catalog is to remain a flexible instrument. A valid low-frequency use must be given full weight if it can be satisfied only by a particular pattern of file arrangement. In principle, the optimum file arrangement is the one that, at an allowable cost, permits the greatest number of approaches to the catalog with an acceptable degree of efficiency for each type of use. For example: Assume that Arrangement A allows maximum efficiency for a high-frequency use but it is virtually unmanageable for a low-frequency use. Assume that Arrangement B allows moderate efficiency for both uses. If the low-frequency use satisfies a legitimate (authorized) need that cannot be conveniently met any other way, it can be claimed that Arrangement B is the optimum pattern even if the high-frequency use occurs ten times more often.

A fundamental consideration in the arrangement of catalog entries is what users are likely to know and what relation that information has to the entries in the catalog. A user may have "perfect" information as far as his source is concerned yet still encounter difficulty in lo-
cating the desired item. For example, he may know that a book is by Hans Müller but have to examine many entries before discovering that the catalog heading for the desired author is Müller, Hans, of Vienna. The lack of congruence between a user's information and the actual heading is an inevitable consequence of the need to differentiate headings in a large catalog. Furthermore, users often have fragmentary or partially inaccurate information. In such cases, searching can be simplified or even made possible if the catalog is arranged to permit systematic browsing.

It is important to remember that the forms of catalog headings are designed to keep closely related headings together; for example, the subdivisions of a corporate body, or particular aspects of a subject. The rationale of their construction would be worthless if accidents of alphabetization were allowed to determine their position.

The principle of "browsability" as a factor in bibliographical searching should not be minimized. Many library devices are designed to facilitate ranging back and forth in a meaningful way. For example, classification is intended to be used this way either in terms of grouping books on shelves or entries in a classified catalog. The ability to browse in a catalog is especially important in a large library where users find it inconvenient or impossible to go to the shelves; even if they do, they will find only part of the library's holdings in a particular field. If the library arranges its collections by accession order or size, the catalog becomes the sole remaining place where users can browse at all.

Another important consideration is what users know about the arrangement of the catalog. Clearly, the less specialized knowledge a user has to have about a catalog, the more quickly he can become efficient in using it. It must be accepted as a fact of life, however, that the arrangement of the catalog of a large research library cannot be self-evident. As has already been pointed out, the complexity of its arrangement is a function of the number of catalog entries, and the diversity of the languages and forms of material represented. When this is compounded by efforts to make the catalog responsive to a variety of needs, it is inevitable that the arrangement will be inconvenient or confusing for some users.

Under these conditions, it is wishful thinking to suppose that users can satisfy their needs in a large catalog without personal instruction and/or built-in guidance in the form of information cards that explain the arrangements at critical points. Until these aids are provided, it is a mistake to suppose that difficulties in using a catalog are solely attributable to defects in its arrangement.

Aids to Catalog Use

At this point, it may be helpful to describe some of the ways of explaining the structure of the catalog to users. The following aids should be provided:

1. A detailed filing manual. This is a necessity for filers and frequent users of the catalog.
2. A brief version of the essential rules. This should be posted prominently at various points in the area of the card catalog, included at the beginning of each volume of the book catalog, and made available to individual users in sheet and/or card form.

3. Information cards and references. Three types are needed: categorical references, specific filing references, and arrangement cards. They should be interspersed at appropriate points in the catalog itself. The following paragraphs describe the content and use of each type of reference.

A categorical reference briefly explains a particular rule, describes its effect on entries in variant forms, and points to other parts of the file where they may be found. By functioning as a general reference for a category of headings (e.g., those beginning with a numeral), a categorical reference minimizes the need for specific filing references. Example 1 shows a categorical reference.

Example 1. Categorical Reference

Information Card: Treatment of Numbers

Numbers expressed as numerals (e.g., 4, 1984, XX) precede words consisting of letters and they are arranged according to their numerical value (roman numerals are treated like Arabic numerals).

Numbers expressed as words (e.g., four, nineteen eighty-four, twenty) are filed alphabetically.

If you do not find what you want in this portion of the catalog, look under the alternative form. When looking for a verbal form, bear in mind that it will appear in the language of the item you are seeking and that the verbal form may be expressed in any one of several ways (e.g., one hundred, a hundred) which file in different places in the catalog.

This type of catalog aid is filed with sizable groups of entries under variant forms of the same item. For example, the explanation of the treatment of numbers belongs with entries beginning with numerals and with groups of entries beginning with specific numbers expressed in words (e.g., one, one hundred).

For a card catalog, arrangement cards and categorical references should be printed on 3½” x 5” stock with the caption along the top edge so that they protrude above neighboring cards. Only one categorical reference of a given kind is needed in a catalog drawer. In a book catalog, the categorical reference should be printed in the top right-hand corner of an odd-numbered page. It is not necessary to have the same categorical reference on every two-page spread of a given group of entries, but the information should be repeated every four to six pages when there is a long sequence of entries of one kind.

Categorical references should be made to explain the following

- 244 - Library Resources & Technical Services
rules: abbreviations, hyphenated words (file only under common prefixes); initials and acronyms (only with entries filed as separate letters); names with prefixes (file only under common prefixes); numerals. The need for categorical references for other rules would be dictated by the structure and size of a given file.

A reference should be made for a specific heading or group of headings that, by the rules, may be located in an unusual position in the file. It is made by reconstructing the heading so that the reference can be filed by the rules in a desired alternative location. Example 2 illustrates a filing reference for a group of headings. Example 3 shows a filing reference for a single heading. This type of catalog aid supplements references from alternative forms of heading required by the cataloging rules.

Example 2. Filing Reference for a Group of Headings

U.S. Army. Infantry

Entries for headings with a numeral before the last part of this heading (e.g., U.S. Army. 1st Infantry) are in the group of headings arranged in numerical order after subject headings for U.S. Army and before headings beginning U.S. Army. A . . .

Each numbered infantry will be found in its alphabetical place in the group of headings beginning with that numeral.

Example 3. Filing Reference for a Single Heading

TREES—WEST
see
TREES—THE WEST [filed under The]

The arrangement of entries under certain headings (typically uniform titles and voluminous authors) is frequently so complex that a user cannot be expected to find his way without assistance. To alleviate his problems, the arrangement of the group of entries should be described briefly on a card that is filed at the beginning of the group. In a long file (such as entries for the Bible), it may be desirable to intersperse several such cards at strategic points. Example 4 is an arrangement card.

Simplification of Filing Arrangement.—None of these remarks should be construed as a denial of the fact that some patterns of library filing arrangement are better than others. Obviously, a relatively consistent
pattern of arrangement has fewer quirks than does one that is a mass of exceptions to basic rules. Therefore, in formulating rules for arrangement, every effort should be made to establish rules that can be applied consistently when entries are added to the catalog and that are susceptible to intelligent use when searching in it. Rules that satisfy these criteria will reduce the number of decisions that must be made in filing, searching, and (in an automated system) computer sorting. In this way, they will reduce the real costs of creating and using the catalog.

Many previous attempts to simplify library filing rules have abandoned formal structuring, thereby sacrificing an irreplaceable advantage in the name of simplification. At the same time, most of them have, to some extent, clung to the notion that variations in form (e.g., abbreviations and numbers in digits) should be normalized by filing them according to their spoken forms. There is a fundamental contradiction in these viewpoints. Straight alphabetical arrangement places a great premium on a user's knowing how a heading is constructed, but if a user can be presumed to have this kind of information, he is at least as likely to know how it looks as how it sounds.

The emphasis on spoken forms of abbreviations, numbers, symbols, and the like is a major source of difficulty in both filing and searching because of uncertainty about the proper spoken form even in English. When these elements must be verbalized in a foreign language, the catalog entry provides the answer for the filer, but users, who may or may not know the practices of the language, are left to their own devices. It seems questionable, therefore, whether the benefits of normalizing variant elements outweigh the disadvantages.

Example 4. Arrangement Card

```
Goethe, Johann Wolfgang von, 1749-1832

Entries under this heading are grouped as follows:
Works written, edited, or translated by the author and works to which he contributed in some other manner are arranged by title. Made-up titles* are filed alphabetically among individual titles.

Under each title, the groupings are as follows: 1) editions in the original language and added entries for related works, by date; 2) works about the title, by author, title, and date; 3) translations of the work, by language and date.

Works about the author are arranged by author of the work, title, and date.

* Correspondence, Plays, Poems, Selected Works, Selections, Works
```

Assumptions
The preliminary considerations about the nature of the arrangement of large bibliographic files were crystallized into seven assumptions:
1. File arrangement should be hospitable to various kinds of uses: searching for a known item with perfect information; searching for an
item with incomplete or inexact information; browsing.

2. Basic rules should be applied consistently with as few exceptions as possible. Consistency has obvious advantages for filers and users, and it facilitates programming for computer filing.

3. Variations in form among name and subject headings are an essential part of the structure of a file arrangement; they should not be ignored in filing. It is illogical to construct a heading one way and then to file it as if it were constructed another way.

4. It is impossible to eliminate all (or even most) filing problems by revising the rules for constructing headings. In a large file, references are required to lead a user from purely formal variations of a heading to the one actually used. The fact that such references will always be necessary indicates that some filing problems will persist regardless of changes in the cataloging rules. In any event, it is likely that headings established under various cataloging rules and practices will coexist in the LC files for an indefinite period.

5. The pattern of catalog organization (e.g., dictionary, divided) has an effect on the complexity of arrangement but, in itself, no single pattern can resolve all filing problems. Moreover, the Library of Congress uses alternative patterns for different purposes. Therefore, the rules for filing arrangement should be adaptable to all patterns of catalog organization.

6. Rules for arrangement should discriminate among catalog entries only up to a point. It is unrealistic to expect the rules to provide unique positions for the tiny proportion of entries that would not be differentiated by a standard set of filing fields.

7. The arrangement of the catalog of a large research library cannot be self-explanatory. To minimize this disadvantage, it is imperative to provide a wide range of aids to catalog use.

**Principles**

The foregoing assumptions led to the formulation of three basic principles that shaped the development of filing rules that might better serve the needs of the Library of Congress:

1. Elements in a heading should be taken in exactly the form and order in which they appear.

2. Related entries should be kept together if they would be difficult to find when a user did not know their precise form.

3. A standard set of fields should be established for each major type of filing entry.

The first principle emphasizes the way a heading looks, not how it sounds. Similar elements that differ in form (e.g., numbers expressed in digits and those expressed in words) are filed in different positions, but the inconvenience of having sometimes to look in two places is outweighed by the fact that no special linguistic knowledge is required to find a numeral or an abbreviation when its printed form is known. When the proposed LC rules were developed, only a few exceptions
had to be made to this “file-as-is” principle.

The second principle acknowledges the fact that the more formally constructed a heading is, the less likely a user is to know its elements precisely. Therefore, headings that begin with the same elements are grouped in categories to reduce the time needed to browse in a large file for a heading that is known incompletely. Adhering to this principle preserves important values offered by the present arrangement of the LC catalogs.

The third principle applies the legal precept *De minimis non curat lex* (the law cannot take care of trifles) as a way of preventing the proliferation of special rules. As a result, in some instances (notably certain title main and added entries), the standard set of fields may be insufficient to differentiate among similar filing entries. It seemed unwise, however, to provide for consideration of other information (e.g., place of publication) as a means of further arrangement. Special rules of this kind are difficult to apply either manually or by computer and the nature of the arrangement is frequently not apparent to users. “No-order” filing seemed to be the lesser evil since a desired item can be found by scanning, as is done now when a user lacks full information or does not understand the arrangement or wishes to guard against misfiled entries.

At first glance, rules based on these principles may seem to have several unsatisfactory consequences, but there is virtue in the consistent application of a relatively small number of basic rules. Allowing only a few exceptions and treating those in a straightforward manner simplifies the tasks of both filers and users. The pro’s and con’s of this situation simply confirm a fact of life: every solution creates its own problems. There is reason to believe, however, that the proposed rules solve far more problems than they cause.

It should also be borne in mind that many filing problems can and should be anticipated and solved during cataloging. Catalogers must learn to recognize entries that will, for all practical purposes, be unfindable and avoid this eventuality by providing coherent access points. This may be done by modifying the way a heading is constructed or by making an added entry in a more fileable form. In any case, the responsibility for the form of filing entries rests with catalogers; filers should not be expected to improve on their work.

**Character of the Proposed LC Rules**

The rules developed according to these principles were formulated so that they can be applied deductively; this approach ensures a degree of comprehensiveness and consistency that is difficult to attain when a separate rule is written for each specific case. General rules give all of the basic specifications for arranging a file. They are presented systematically, progressing from those of widest applicability to those of more limited scope. Their effect is cumulative so that, to understand any given general rule, one must understand the preceding rules. Spe-
cial rules cover particular situations that may be encountered in applying general rules.

The rules were written to say what must be done; only rarely do they give negative instructions. Because a deductive approach was used, it may seem that some familiar situations are not covered. Careful consideration of the implications of the basic rules will reveal, however, that they provide for every type of heading. In addition, more than 1,200 examples are given in the full text of the rules to show their effect on types of headings that are not specifically mentioned in the rules themselves. In an effort to keep the present article to a reasonable length, only a single composite example has been given and details of the special rules have been omitted. It is hoped that this abridgment has not obscured the essential character of the rules and the arrangements that they produce.

**Anticipated Use**

The proposed rules have been reviewed by divisions in all departments of the Library of Congress and the general reaction has been favorable and, in some cases, enthusiastic. Most of the informed persons outside the Library who have read the rules and generously taken time to comment have approved the abandonment of the traditional “file-as-spoken” principle, although many favor less structured filing arrangements. Both groups have raised questions of detail about the presentation of the proposed rules that will be helpful in preparing a revised text.

The new rules have been used as the basis for developing a computer program to arrange MARC records and they will be applied to computer-produced book catalogs for motion pictures and filmstrips, the Main Reading Room collection, and the Science and Technology Division reference collection. They will also be used in connection with output from the machine-readable file of LC subject headings. Broader implementation of the rules involves many practical problems. Decisions about how and when they might be applied to the National Union Catalog in book form or to the Library’s card catalogs are contingent on factors beyond the scope of this article. It may be expected, however, that as time passes these rules will play an increasingly important role in the arrangement of the LC catalogs.

**PROPOSED FILING RULES FOR THE LC CATALOGS**

(Abridged Version)

The text is divided into four parts: (1) a glossary that defines terms used in the rules; (2) general rules; (3) a summary of the special rules; and (4) a composite example. Each main rule (that is, one with a simple numeral like 5) is subdivided by subordinate numbering (e.g., 5.1, 5.2, 5.2.1) into subrules related to the same aspect of filing arrangement.
The example illustrates a dictionary arrangement based on the rules as applied to a group of entries beginning with a numeral or the letter A. The choice of the dictionary pattern does not constitute a recommendation; it was made to show how the rules handle the most complex form of arrangement.

Glossary

Familiarity with the following terms, which differ from those commonly used in discussing library filing, is an essential prerequisite to understanding the specifications for filing arrangement.

Filing Entry: All of the fields that may be considered in determining the filing position of an item in a catalog; for example, an author heading, title, and imprint date.

Field: A major component of a filing entry that comprises one or more elements (e.g., a heading; a title).

Element: One or more words that make up an integral part of a field (e.g., the surname in a personal name heading). An element and a field are identical when the field contains only one element; for example, a title. The first element in a field is called the leading element; the others are called subordinate elements. For example, in the personal name heading, Carpenter, William, 1871-1944, the leading element is Carpenter; William and 1871-1944 are subordinate elements.

Word: One or more characters set off by spaces and/or marks of significant punctuation.

Character: A character is a letter, digit, symbol, or mark of punctuation.

Significant Punctuation: A mark of punctuation that indicates the end of an element. Typical cases include: (1) the period after a direct order corporate name (e.g., Yale University. Library); (2) the comma after a surname (e.g., Johnson, Edgar); (3) parentheses surrounding
a qualifying term in a subject heading (e.g., Mass (physics)—Measurement).

Punctuation that does not indicate the end of an element is considered nonsignificant. Common instances include: (1) a period after an abbreviation (e.g., Mr.); (2) a comma to increase readability (as in 10,000,000 or Smith, Kline, and French Laboratories); (3) parentheses surrounding a word in a direct-order corporate name (e.g., Vickers (Aviation) Limited). Although nonsignificant punctuation is generally ignored in filing, it may require special treatment in certain situations (e.g., hyphenation; decimals).

**General Rules**

1. **Basic Filing Order**

   Fields in a filing entry are arranged word by word, and words are arranged character by character. This procedure is continued until one of the following conditions occurs:

   a. A prescribed filing position is reached.
   
   b. The field comes to an end (in which case placement is determined by another field of the entry or by applying one of the rules given hereafter).
   
   c. A mark of punctuation showing a subarrangement intervenes.

1.1. **Order of Letters**

   Letters are arranged according to the order of the English alphabet (A–Z).

1.1.1. **Modified Letters**

   Modified letters are treated like their plain equivalents in the English alphabet.

1.2. **Placement of Numerals**

   Numbers expressed in digits or other notation (e.g., roman numerals) precede letters and, with few exceptions, they are arranged according to their numerical value. According to this rule, all filing entries beginning with numerals appear before entries beginning with the letter A. Numbers expressed as words are filed alphabetically.

1.3. **Signs and Symbols**

   Nonalphabetic signs and symbols within a field are generally ignored in filing and the following letters or numerals are used as the basis of arrangement.

1.3.1. **Punctuation**

   Punctuation as such has no place in the collating sequence of characters considered in filing arrangement. A mark of punctuation is taken into account, however, in two situations: (1) when it signals the end of an element or field and indicates the need for subarrangement as described in the following rules; and (2) when it serves as the sole separator between two discrete words (e.g., Mott-Smith; 1951/1952; 1:3) and so must be treated as equivalent to a space.

*Volume 16, Number 2, Spring 1972*  
  
  251
2. Significant Filing Elements

Elements in a field are taken exactly as they appear with few exceptions. Thus, the position of a filing entry is basically determined by the order and form of the fields it contains.

3. Identification of Elements in a Field

Elements in a field containing more than one element are generally indicated by a dash, period, comma, or parenthesis.

3.1. Nonsignificant Punctuation in a Field

A field may contain a dash, period, comma, or parenthesis that does not indicate the end of an element. The following guidelines may be helpful in discriminating between significant and nonsignificant punctuation: (1) significant punctuation indicates a formal combination of elements in a field; (2) nonsignificant punctuation occurs as an integral part of a name or title.

3.2. Leading Element

The leading element in a field is indicated by the first significant dash, period, comma, or parenthesis, except when the field contains a forename followed by a roman numeral (Rule 3.2.1.).

3.2.1. Forenames with Numeration

When a forename is followed by a roman numeral (as in a heading for a pope or sovereign), the leading element ends before the numeral.

4. Order of Fields with Identical Leading Elements

Fields with identical leading elements are grouped together. When the leading elements in a group denote different types or entities, the order of arrangement is as follows:

a. Person: (1) Forename
   (2) Surname

b. Place

c. Thing: (1) Corporate body
   (2) Topical subject heading

d. Title

4.1. Placement of Certain Categories of Leading Elements

For the purpose of file arrangement, leading elements of the following types are considered to be surnames: (1) the distinguishing word in a nobleman’s title; (2) the name of a bishop’s see; (3) the name of a family, clan, dynasty, house, or other such group; (4) part of a corporate name followed by inverted initials and/or forenames.

5. Order of Subordinate Filing Elements

When the leading elements of two or more fields are identical and they denote the same type of entity, the arrangement takes account of subordinate filing elements according to various patterns. The position of a leading element qualified by more than one subordinate element is determined by the order in which the elements appear.

5.1. Forename Fields

The leading element of a forename field may be followed by one or more of the following categories of subordinate elements: (1) numerals...
tion; (2) dates; (3) qualifying words; (4) form subheading. When forename fields with identical leading elements have subordinate elements in the first three categories, they are grouped in the following order:

a. Forename alone
b. Forename with numeration
   Forename, date(s)
   { filed in one sequence }
c. Forename, qualifying word(s)

In arranging qualifying words within a group, differences in punctuation are ignored.

5.2. Surname Fields

The leading element of a surname field may be followed by one or more of the following categories of subordinate elements: (1) forenames, initials, or (in the case of a nobleman, bishop, or family) a full name; (2) dates; (3) qualifying words; (4) a word (called a relator) that shows the function of a person in relation to a work with which his name is associated; (5) form subheading. When surname fields with identical leading elements have subordinate elements in the first three categories, they are grouped in the following order:

a. Surname alone
b. Surname, date(s)
c. Surname, qualifying word(s)
d. Surname, forename
e. Surname, forename, date(s)
f. Surname, forename, qualifying word(s)

Relators are ignored in filing as described in Rule 10.1. [not included]. The treatment of form subheading is described in Rule 6.3.

5.2.1. Corporate Names with Inverted Initials and/or Forenames

The leading element of a corporate name beginning with a surname followed by initials and/or forenames ends before the mark of punctuation setting off the inverted element. A heading of this type interfiles among headings with the same surname. The words following the inverted element up to the next period are treated as part of it.

5.3. Place Name Fields

When the leading elements of two or more place name fields or place names at the beginning of a corporate name field are identical but they are qualified by different means, the fields are grouped in the following order:

a. Place name alone
b. Place name followed by parenthetical qualifier
c. Place name followed by a comma and qualifying word(s)

Subarrangement within any group is by succeeding subordinate elements.

5.4. Corporate Name Fields

When the leading elements of two or more corporate name fields are identical but they are qualified by different means, the fields are grouped in the following order:

Volume 16, Number 2, Spring 1972 • 253 •
a. Corporate name alone
b. Corporate name followed by a comma and qualifying word(s)
c. Corporate name followed by parenthetical qualifier

5.5. Uniform Title Fields

When the leading elements of two or more uniform title fields are identical but one heading is not qualified and the others are, the fields are grouped in the following order:

a. Uniform title alone
b. Uniform title with qualifier (regardless of punctuation)

5.5.1. Subordinate Elements of Uniform Title Headings and Filing Titles

The subordinate elements of a uniform title heading or a uniform filing title may describe (1) part of the larger work (including such terms as "selections"); (2) language of the text; (3) name of the version; and (4) date of the edition. The preceding sequence shows the order of subordinate elements if more than one occurs with a particular uniform title. In filing arrangement, however, when different types of subordinate elements occur in the same relative position (for example, as the second element), the fields are grouped in the following order:

a. Date
b. Language
c. Version
d. Part

Additional instructions for arranging uniform titles are given in Rule 19 [not included].

5.6. Topical Subject Headings

When the leading elements of two or more topical subject headings are identical but they are qualified by different means, the fields are grouped in the following order:

a. Leading element alone
b. Leading element followed by a comma and qualifying word(s)
c. Leading element followed by parenthetical qualifier

5.7. Subject Subdivisions

In any subject heading field, subordinate elements that follow a dash (that is, subject subdivisions) are grouped in the following order:

a. Period subdivisions
b. Form and topical subdivisions
c. Geographical subdivisions

These distinctions are maintained at every level of subject subdivision.

6. Placement of Certain Types of Fields

To obtain coherent groupings of filing entries relating to the same entity, the following rules must be observed in arranging three types of fields: (1) author-title fields; (2) fields containing subject subdivisions; (3) personal name fields containing form subheadings.

6.1. Author-Title Fields

A field comprising a personal or corporate author and a title (e.g.,
Aristoteles. Metaphysica; Society for Pure English. Tract no. 36) is treated as if it consisted of two separate fields containing the same information. Thus, with respect to this consideration, no distinction is made between a filing entry containing separate fields for an author and a title and a filing entry containing an author-title added or subject entry for the same work. See Rule 8 for instruction on the arrangement of entries under the name of an author.

6.2. Fields Containing Subject Subdivisions

A field containing a subject subdivision is treated as if it consisted of at least two parts: the heading proper and the subject subdivision(s). In the case of author-title fields with subject subdivisions, the field is treated as if it consisted of three parts (author, title, subject subdivision) to satisfy the requirements of Rule 6.1. In both circumstances, the subject heading field is grouped with main and added entry fields containing the heading proper. After the functional order of the fields has been taken into account (see Rule 7), arrangement is by subject subdivision.

6.3. Personal Name Fields Containing Form Subheadings

A personal name field containing a form subheading (e.g., Spurious and doubtful works) is treated as an entirely different entity from the personal name on which it is based. Such a heading is arranged after all main, added, and subject entries relating to that particular person.

7. Functional Order of Fields

When the first fields of two or more filing entries are identical and the fields denote the same entity, the entries are grouped according to the cataloging function of these fields (that is, their relationship to the work cataloged or their use in the catalog) in the following order:

a. Main entry, added entry, see reference
b. See-also reference from main or added entry
c. Subject entry
d. See-also reference from a subject entry

8. Subarrangement of Identical Fields That Have the Same Function

When the first fields of two or more filing entries denote the same entity and they are functionally identical, the entries are arranged according to their subordinate fields. The selection of subordinate fields for a filing entry must conform to one of four basic patterns:

a. Type 1: (1) Main or added entry for a person or corporate body
   (2) Title
   (3) Imprint
b. Type 2: (1) Author-title added entry
   (2) Imprint date
c. Type 3: (1) Main or added entry under title
   (2) Imprint date
d. Type 4: (1) Subject entry (including author-title entries)
   (2) All fields of Type 1 or Type 3 filing entry for catalog record in question
8.1. Choice of Title

Filing entries of Types 1, 2, and 3 can contain only one title. In the case of Types 1 and 3, if more than one kind of title is present in the catalog record, the order of preference is: (1) uniform title heading; (2) uniform filing title; (3) romanized title; (4) bibliographic title. In the case of a Type 2 filing entry, the title to be used occurs as part of the first field.

8.1.1. Uniform Title Headings and Filing Titles

Some of the elements necessary to arrange a uniform title heading properly may appear in a uniform filing title field. For example, the uniform title heading Arabian nights may be made more specific by giving the language of the edition in a filing title field. When this occurs, the uniform title heading and the filing title are treated as one field which is used in the filing entry.

9. Treatment of Identical Filing Entries

When two or more filing entries are identical, no effort need be made to arrange them within their group. In a manual file, the new entry can simply be placed after those already there. This situation occurs most commonly with filing entries for titles of various kinds (see Type 3 filing entry in Rule 8).

Special Rules

Of the ten special rules, four (hyphenated words, initials and acronyms, names with prefixes, words with apostrophes) only reinforce basic rules by emphasizing their application to particular cases that are treated differently in the current LC filing rules. The remainder either elaborate on basic rules (numerals, romanization of letters, signs and symbols, uniform titles) or describe the relatively few exceptions (elements ignored or transposed, initial articles). These special rules have been omitted because the first group is not essential and the second requires a degree of detail that is beyond the scope of this article. For example, the special rule for numerals describes the treatment of ordinal numerals, fractions, decimals, subscript and superscript numerals, dates in a chronological file, incompletely expressed dates, qualified dates, and dates with month and year.

Example

.300 Vickers machine gun mechanism made easy
'.45-70' rifles
1:0 für Dich
Het 1, 2, 3 van de economie
1, 2, buckle my shoe
1/10th hours of 48 hours a week pay roll wage calculator
2° is 64
II-VI semiconducting compounds
The $2 window on Wall Street
3-5-7 minute talks on Freemasonry
3:10 to Yuma
3 died variously
3.1416 and all that
100/o American (Motion picture)
100 Jahre Brennerbahn
A***, comte de
A., Dr.
A***** Major, pseud.
A., A.
A., Andre, C. H.
A., J., of Grays Inn, esq.
A., J. A.
“A” 1-12
The A.A.A.
A. B. C.
A Bayreuth avec Richard Wagner
A Beckett, Arthur William, 1844-1909
A.C. devices with iron cores
A.C.F., tr.
A und O
A & O Osterreich
A une courtisane
The A. Z. A. leader
Al (BARK) [corporate name as subject entry]
Al atlas of Bristol & outer suburbs
A 4D desert speed run
Aa, Pieter van der, 1659-1733
AAA travel
Ab-sa-ra-ka, land of massacre
Abbey, Edward, 1927-
ABC air cargo guide and directory
"Abd al-Hamid, Färūq
"Abdallah, King of Jordan, 1882-1951
A'Becket, Thomas, 1843-1918
Absalom, Roger Neil Lewis
Absalom, Absalom!
Abû I-Tâhir al-Fârisî [reference]
Abul Hasant, 1905-
AC motors and control gear
ACAA in brief
ACCELERATION, NEGATIVE [reference]
ACCELERATION (MECHANICS)
ACCELERATION IN EDUCATION [reference]
Achsel, Richard
Acht Hunde und mehr
Adams, ———, joint comp.
Adams, master
Adams, ———, Springfield, Mo., printer
Adams, Andrew
Adams, Andrew, 1786-1797
Adams, Andrew A.
Adams, Charles True
Adams, Dorothy, 1912-
Adams, Mrs. Dorothy Dort
Adams, Dorothy Inez, 1904-
Adams, E. A., & co., Boston
Adams, Sir Francis Boyd
Adams, Francis Colburn
Adams, J. Harry

Volume 16, Number 2, Spring 1972 · 257 ·
Adams (J.J.) and Company, Boston
Adams, J. M.
Adams, Zackary
Adams, Mass.
Adams, Tenn.
Adams (U.S. Steamer)
Adams-Acton, Murray, 1886–
Adams and Hollingsworth, Philadelphia [reference]
Adams-Beck, Lily (Moresby) [reference]
Adams Co., Pa. Court of common pleas
Adams County (Ill.) agricultural and mechanical association
ADAMS FAMILY (ELIJAH ADAMS, 1753–1817)
Africa, Bernabe, 1892–
Africa, J Simpson, b. 1832
AFRICA [subject]
AFRICA—COLONIZATION
AFRICA—RELIGION
AFRICA, BRITISH EAST
AFRICA, EAST
Africa [title]
AFRICA IN LITERATURE
Africa speaks
Al, Peter
Al-Anon Family Group Headquarters, inc.
Al Capone car hangsterjev
Al-Dib, ‘Alî’
Al encuentro del hombre
Al-i-Ahamd Surror, 1912–
Al Lichtman Corporation
ALA daily reporter
ALAND ISLANDS
ALBANY, JOHN STEWART, DUKE OF, 1481–1536
ALBANY
ALBANY—BRIDGES
ALBANY—WATER-SUPPLY
Albany. Bar
Albany. Common council
ALBANY, COMMON COUNCIL—RULES AND PRACTICE
Albany (Port district) Port Commission
ALBANY, AUSTRALIA
Albany, Me.
Albany, birthplace of the Union
Albany Co., N.Y. [title]
Albany Co., N.Y. Board of supervisors
Albany Co., N.Y. Penitentiary
Albany Co., Wyo.
Albany congress, 1754
Albany County, N.Y. [title]
Albany County Home Bureau
Albany County (N.Y.) Historical Association
Albany Library
Albert I, King of the Belgians, 1875–1934
ALBERT I, Prince of Monaco, 1848–1922
Albert II, Emperor of Germany
Albert V, Duke of Austria
Albert, consort of Queen Victoria, 1819–1861
Albert, father
Albert, Sister, O. P.
Albert, von Rickmersdorf
Albert Achilles, elector of Brandenburg
Albert Edward, Prince of the Hawaiian Islands
Albert von Prag, fl. 1386
Alexander I, Emperor of Russia, 1777–1825
ALEXANDER I, KING OF SERBIA, 1876–1903
ALEXANDER I, PRINCE OF BULGARIA, 1857–1893
Alexander III, Emperor of Russia, 1845–1894
ALEXANDER III, KING OF SCOTLAND, 1241–1286—FICTION
ALEXANDER III, POPE, d. 1181
Alexander VI, Pope, 1431–1503
ALEXANDER VII, POPE, 1599–1667
Alexander, duke of Württemberg, 1771–1833
Alexander, Prince of Hesse and of the Rhine, 1823–1888
Alexander, pseud.
ALEXANDER, SAINT, BP. OF FERMO, D. CA. 250
Alexander, Mrs.
Alexander, Prof.
Alexander, Albert
Alexander, Robert Jackson, 1918–
Alexander (Robert) Productions
Alexander, Me.
ALEXANDER (SHIP)
ALEXANDER AB ALEXANDRO, D. 1523
Alexander and after (Filmstrip)
Alexander & co., Boston
ALEXANDER THE GREAT, 356–323, B.C.
ALEXANDER THE GREAT, 356–323, B.C.—ROMANCES
Alexander the Great (Romances, etc.) [Uniform title heading]
Alexander the Great and his time
ALEXIUS, SAINT
Alexius, Nicolaus, ca. 1513–1585
Alexius [title]
An American [pseudonym]
AMERICAN (ARTIFICIAL LANGUAGE)
An American ABC
American Bar Association
AMERICAN BAR ASSOCIATION—BIBLIOGRAPHY
American Bar Association, Advisory Committee on Pretrial Proceedings
AMERICAN LITERATURE
AMERICAN LITERATURE—COLONIAL PERIOD [1607–1775]
AMERICAN LITERATURE—REVOLUTIONARY PERIOD [1776–1799]
AMERICAN LITERATURE—EARLY 19TH CENTURY [1800–1850]
AMERICAN LITERATURE—19TH CENTURY [1800–1899]
AMERICAN LITERATURE—20TH CENTURY [1900–1999]
AMERICAN LITERATURE—ABSTRACTS
AMERICAN LITERATURE—STUDY AND TEACHING
AMERICAN LITERATURE—ALABAMA
AMERICAN LITERATURE—OHIO VALLEY
AMERICAN LITERATURE (FRENCH)
American peace congress, 1st, New York 1907
American peace congress, 2d, Chicago, 1909
Ames, Edward Scribner, 1870–1958
AMF guide to natural bowling
—And all points west!
The Anti-Americans

Volume 16, Number 2, Spring 1972 • 259 •
Anti "block-booking" and "blind selling"
Anti-Cobweb Club, Foochow
Anti-slavery and reform papers
Antiaircraft defense
An antidote against swearing
Antietam, pseud.
Antietam, Md. National Cemetery
Antietam (Aircraft carrier)
Antietam [title]
Antietam, 1862 (Motion Picture)
Antietam Creek
Antitrust and monopoly activities
APICS bibliography
An April afternoon
Aragon, House of
Aragón, Victor
Aragon. Cortes
Aragon. Sovereigns, etc., 1291–1327 (James II)
Aragón [serial title]
Aragón Arteaga, Agapito
Aragon au défi
Aristoteles [main entry]
Ethica [title]
Aristoteles
Metaphysica
Aristoteles. Metaphysica [author-title added entry]
ARISTOTELES. METAPHYSICA [author-title subject entry]
ARISTOTELES. METAPHYSICA—BIBLIOGRAPHY
Aristoteles
Poetica
Aristoteles
Rhetorica
Aristoteles. Rhetorica [author-title added entry]
ARISTOTELES
ARISTOTELES—BIBLIOGRAPHY
ARISTOTELES—TRANSLATIONS
Aristoteles. Spurious and doubtful works [heading with form subheading]
Arrest, Heinrich Louis d', 1822–1875
Arrest du conseil d'État d'Apollon
Arrest, search and seizure
Art, Robert J.
ART—ADDRESSES, ESSAYS, LECTURES
ART—GALLERIES AND MUSEUMS
ART—YEARBOOKS
ART—STOCKHOLM
ART—THE WEST
ART—TURKEY
ART, AFRICAN
ART, DECORATIVE
ART, RENAISSANCE
Art [serial title]
Art and action
Art & education
ART AND STATE
Art et action, Paris
Art & curiosité
ARTHUR III, DUKE OF BRITTANY, 1393–1458

• 260 •

Library Resources & Technical Services
Arthur, Joseph Charles, 1850–1942
Arthur and Company, ltd., Glasgow
Arthur-Behenna, K.

ARTHUR FAMILY

... ¡Así son nuestros niños!

At Lee, Samuel Yorke
At morning dawn the hunters rise
At Mrs. Lippincote’s
Atlay, James Beresford, 1860–1912
Atlee, Benjamin Champneys, 1872–
Augsburg. Städtische Kunstsammlungen
Augsburg (Diocese)
Augsburg (Landkreis)
Augsburg College
Avesta, Sweden
Avesta. [1908] [uniform title heading; imprint date is not part of heading]
Avesta. [1962]

AVESTA—DICTIONARIES
Avesta. Danish
Avesta. English. Selections
Avesta. Bahrām Yasht [reference from part]
Avesta. Nirangistān. German
Avesta. Selections
Avesta. Yasna. Sanskrit
Avesta jernverks ab
Awdry, Frances

Az ázsiai termelési mód kérdéséhez
How does a recent library school graduate appointed to supervise the photoduplication department in a university library familiarize himself with the duties of the position and with the field of reprography in general? A checklist of twenty areas is offered as a guide to the novice. This is a brief and unabashed “how-to-do-it” presentation.

In the summer of 1970, while working in the MARC project at the Library of Congress, I accepted an offer to head the Reprography Department at the University of Hawaii. The position was irresistible. Who would not jump at the opportunity to leave Washington’s climate and escape to the land of perpetual summer?*

But what was reprography? Even my beloved Random House Dictionary failed to list the word, and it was not until I stumbled across William R. Hawken’s Copying Methods Manual that I found an explanation of the term.

Reprography, or photoduplication, is taught in very few library schools—two exceptions are the University of Maryland and Columbia—aside from fleeting references to problems with respect to the copyright law, the difficulty in cataloging nonbook materials, and the storage and servicing of microfilm, microfiches, microcards. There are relatively few librarians who work in this field, and it appears that there has not been enough interest or pressure to teach photoduplication techniques. It comes as quite a shock, then, to realize that all those painful hours in library school have not been sufficient preparation for photoduplication work.

It would take a dissertation to cover all of the things to be learned,

*I was very fortunate in gaining the sympathy and assistance of Charles G. La-Hood, Jr., chief of the Photoduplication Service at the Library of Congress, and the assistant chief at that time, Robert C. Sullivan. The time and effort these gentlemen spent with me was far beyond the call of duty and did a great deal to steer me in the right direction as I began to realize the complexities involved in learning the duties of my new position.
and such a listing would make difficult reading. In my opinion, the best way to learn the trade (let us not get into a discussion about professionalism here!) is through on-the-job-training in an already established photoduplication service. If this is not possible, or if, like myself, you are thrown into such a situation, the following checklist might make the difference between complete panic and a rational approach to your work.

1. What are your library's goals and how does the photoduplication department fit into the overall picture? Be sure you know the types of services your department offers. Are you set up to copy only library materials, or can you do special jobs on demand?

2. At the earliest opportunity, involve yourself with the day-to-day production of your laboratory's products: photography, microfilm, photocopying, catalog card production, etc. As time permits, operate the cameras, get into the darkroom, and handle the material. Only then will you understand the different processes so that you can talk intelligently to your customers.

3. Check on the procedures to be followed in ordering supplies. Study the usage of materials so that you can order enough in advance for your needs. It is quite embarrassing to exhaust your supplies, especially when this means that production stops until new shipments are received.

4. How accessible are you? Are your hours of service compatible with the demands and work patterns of your customers? Are you open during lunch time?

5. Be sure that all public service personnel are familiar with your services. Prepare a policy statement, listing the types of work done, prices for each, and hours of service.

6. What is your personnel situation? Do you have full-time assistance or is the majority of your labor comprised of students? Do you have a steady turnover of personnel? How are new workers hired? Do you need to write instructional procedure manuals for positions that have high turnover? How difficult is it to get additional personnel? What channels do you have to go through? Are your personnel being utilized in the most efficient manner? Are they good at their jobs? What information do they have to pass on to you in order to make your job easier?

7. How is your photoduplication service funded? Are you on a revolving fund, or financed by the library or the university? Are you expected to show a profit or just break even? The answers to these questions will affect your pricing structure. Cost studies will show if you are losing money, and if so, you will want to take a closer look at your financial operation.

8. Unless you are very lucky, the filing system will be inadequate for your needs. Spend time to reorganize, reading all the information possible in order to give you a general picture of your department's opera-
tion in the past, as well as policy decisions you will be expected to implement in the future.

9. Set up a ready reference system for brochures and hand-outs on different services of the department. Arrange them so that you can find information quickly. Subject headings might include: microfilm readers; microfiche readers; cameras; cabinets; etc. Because of your position it will be assumed by campus personnel that you are an expert, and having this information literally at your fingertips may prove to be a great face-saver.

10. If there is no current inventory, take one. Ask fellow workers or local dealers about the operation of your equipment. Search the files for handbooks and manuals and try to determine how the equipment should be used.

11. How adequate is your equipment? Is each piece right for the job you want it to do? How old is it? Is it working properly? Is it obsolete and, if so, can it be replaced by a better model?

12. Do you have maintenance contracts on your equipment? If so, are the companies who have the contracts fulfilling their obligations? Are the contracts necessary? For example, if you have a service contract on microfilm readers, you might be better off financially to arrange to do routine maintenance in-house and only call the repairman in an emergency.

13. Should you buy or lease equipment? Should you buy you may be stuck with an obsolete model if a better model comes out later, while if you lease you can turn the machine in at any time. Leasing may cost a little more money in the long run than buying, but in many cases it is more advantageous than outright purchasing.

14. Contact the local photocopier representatives in your area. They will be glad to show you how their products operate. Some companies offer half-day sessions in the care and feeding of their equipment, and this can be very valuable. How flexible is the copier? Can it copy catalog cards? Make overhead transparencies? Does it use bond or electrostatic paper? Examine the various benefits and drawbacks of the different photocopying machines on the market to determine which ones will do the best job for you.

15. Make a few phone calls to the sales departments of firms whose names you find in the files. Most companies will gladly send a sales representative to talk with you, and this type of exploratory meeting can often be valuable. Ask the salesman what his company sells and what he can do for you. This is a good chance to ask questions regarding the operation of equipment already in your shop. Also ask him to keep you posted regarding those of his company’s new products that you might be able to use in the future.

16. How accessible is your microform collection? Is the material listed in the card catalog, the shelflist, and/or a separate printout? Is the collection arranged in a logical order—alphabetically or numerically—with an index? It is helpful to compile a list of the microforms you
consider to be the most used. Not only will this give you a feel for the collection, but the list will make it easier for patrons to use your holdings.

17. How do you store your microfilm? Do you have space for expansion and available funds to purchase additional cabinets? If space and money are limited (and aren't they always!) perhaps storing film in cardboard boxes on shelves will be more economical in terms of both space and money. Can patrons locate materials if there is no one in the reading room to assist them?

18. Study the advertising brochures and controlled circulation periodicals that are sent to you. You can often pick up good pointers. A useful series, for example, entitled "Microfilm Q's and A's," by R. W. Batchelder, can be found in Information and Records Management.

19. Take time to study the literature resources in your library that relate to your job. Browse through the shelves to see the kind of materials that are available. Are they current or dated? Begin a desk collection of useful reference books; become familiar with ALA's Library Technology Reports. (A starter list of books appears at the end of this article.)

20. Volunteer your services to the reference department by offering to conduct tours of your facility. You can learn a great deal through the questions you are asked. Become acquainted with faculty members who are media-oriented and work with their students in using your equipment and microform collection. If your university has a library school, offer to conduct classes or workshops in various areas of your specialty in appropriate courses. Instructors usually welcome knowledgeable guest lecturers. When you become really confident, you can prepare a course to be taught in Library School.

Perhaps to many readers the above checklist will be "old hat." Certainly a lot of it is common sense. But to a tyro reprographer it could prove to be invaluable!

BASIC BOOKS

IN THE MAIL: CATALOGING NONBOOK MATERIALS

For the past several years I have been on the faculty of the Graduate School of Library Studies of the University of Hawaii, teaching cataloging and classification. For the past year I have offered a specialized course in the Organization of Nonbook Materials. As a consequence I was much interested in your article, "The Cataloging of Nonbook Materials: Basic Guidelines," in the Fall 1971 issue of LRTS (15:472-78), and find that it has raised a few questions in my mind. Inasmuch as I shall undoubtedly assign this article for reading by students, it would be extremely helpful to have your comments in answer to my queries.

I am somewhat surprised that your article fails to mention the Canadian Library Association publication Non-book Materials: the Organization of Integrated Collections by Riddle, Lewis, and Macdonald. Is this because you disagree with them and are suggesting at least some guidelines which are quite different from those advocated by Riddle and others? For example, Riddle favors classification of all materials by the library classification used for the books in the collection, without any symbol in the call number. You recommend only use of a symbol followed by an accession number. What about the fact that in many libraries today equipment is available which allows integration of most nonbook material on the shelves with books?

Your listing of "formats" gives "(Record)." Is this the format the Anglo-American Cataloging Rules, Riddle, and most others label "Phonodisc"? Do you really intend to advocate a change in a term which has been widely used for a good many years? (Granted that I do not really like "phonodisc.") You have listed (Film). Is this for the format for which Riddle, AACR, and most others use "(Motion picture)? In other words, I am concerned that the "Basic Guidelines," which you present and recommend so strongly, fails to agree in quite a number of ways with items which basically now are recommended in a standardized and uniform way by most of the recent publications by librarians writing in this field.

I could go on also to point out other discrepancies, such as the strange variations in indentation in your examples, especially in "Example 2," top card. This top card in "Example 2" is also somewhat unusual in that ordinarily the tracing for a series added entry is the last item traced and thus would be Roman numeral II on your example instead of I. (I am pleased to see you advocate use of a Roman numeral tracing unlike LC's use of just "(Series).") I also would point out, however, that if the cataloging is to follow AACR, the tracing for the series in this example would need to be: "II. Series: Development of the American short story series (Filmstrip)" would it not? (Cf. AACR, p.283)

I must also confess to concern that there is not standardization in indentation, punctuation, etc., in the tracings set forth in your examples. Students do try to follow examples such as these and become somewhat agitated when there is inconsistency within one source.

And, where is the second card in your "Example 2" to be filed? Is it intended to be a sort of information or cross-reference card to go into the individual shelflist for records—Margaret W. Ayrault, Graduate School of Library Studies, University of Hawaii, Honolulu.

* 266 *

Library Resources & Technical Services
IN THE MAIL: NLM CLASSIFICATION

I have just read in the Fall 1971 issue of LRTS (15:452-57) Mrs. Sophano-
dorn's article, "Problems of the National Library of Medicine Classification for
Serials." I think it is a very good article, apparently accurate in every de-
tail.

We at NLM recognize the problem for other libraries of the use of form
numbers in the NLM Classification. NLM finds their use very satisfactory for
a large library with closed stacks. However, for a library where browsing is
practiced to a great extent, the retrieval capability is often subordinate to the
need to have books on a given subject together. Recognizing that fact, NLM
is in the process of programming to have two call numbers appear in certain
citations in the National Library of Medicine Current Catalog. A form num-
ber prefixed by DNLMM will be the one used for its own books. The second
number prefixed by XNLM will be a subject classification number, complete
with Cutter-Sanborn number and date. It will be maintained in the NLM
shelflist so that it will be a unique number for those few libraries that choose
to follow NLM's Cutting pattern. A library will also be able to purchase
from Bro-Dart, Inc., card sets using this classification number as well as
sets with the NLM form number.

At first these subject classification numbers will be assigned only to cur-
rent English monographs, published in this country. Citations for congresses
classed in W3 and analytics for W1 monographic serials will be the entries af-
fected. If the practice proves useful to other libraries it will be extended in
the NLM Current Catalog at least, to other citations to which a form call
number has been assigned. Bro-Dart's ability to sell cards will determine
whether it extends the card coverage or not.

NLM believes that this practice will fill the need expressed by Mrs. Sophano-
dorn in her article.—Emilie V. Wiggins, National Library of Medicine, Wash-
ington, D.C.

IN THE MAIL: SUBJECT ENTRY SEARCHES

Welcome! Volume 15 no. 4 is certainly a fine pacesetter.

Particularly striking to me was the Massonneau contribution on the abandon-
ment by some computerizers of arrangement under main entry. George Piternick
is quoted to the effect that a subject search can do just as well among title-
arranged daisies as any other way, and the observation made that attention
might well be given first to the "ways in which catalog users make subject
selections" (p. 507).

Permit me to remind all concerned of Recommendation no. 8 in Catalog
Use Study (1958), concerning "General Catalogs with more than 350,000 cards
and Special-Purpose Catalogs":

Subject cards under a given heading were selected by date of publication more than
four times as often as by alphabetical position, although they were nearly always
filed alphabetically.

Therefore, serious consideration should be given to the filing of subject cards by
publication date, with the latest date first." (p. 2)

—Sidney L. Jackson, School of Library Science, Kent State University, Kent,
Ohio.

Volume 16, Number 2, Spring 1972 • 267 •
IN THE MAIL: FORM DIVISION IN DCC 800s

For a new library starting in Dewey classification, I am sure that Lois Mai Chan's article (LRTS, 15:458-71, Fall 1971) would be most valuable and helpful. However, for a library of some size already using the type-of-literature form distinction, any sweeping change as she seems to advocate would entail costly, massive reclassification. Moreover, it would be impossible to get by for a time with two classifications on the shelves: everything would have to be converted promptly to ward off user protest when it is discovered that Yeats' poetical works, or Marlowe's plays (not to mention Shakespeare's), and hundreds of similar cases, are split into two different locations.

As a Dewey cataloger of some years' experience, I am by no means dissatisfied with the 800's form distinctions, and I would be greatly concerned to see the editors of Dewey drop it. However, Ms. Chan is not pleased to find that these editors "have been viewing the 800 class with a certain complacency." I am disappointed to note that she has failed to consider the realities of the situation in established Dewey libraries. Her statement that Dewey catalogers spend "innumerable hours of agonizing over the forms of literary works" is in my opinion considerably exaggerated. It is a help, however, to use a simple authority file with the major authors—such as Mark Twain—to reduce the proliferation of numbers to a minimum.—Daniel Shively, Indiana University of Pennsylvania, Indiana, Pennsylvania.

IN THE MAIL: THINGS TO COME

Your recent editorial note entitled "Things to Come" (LRTS, 15:438, Fall 1971) piqued me. Your comments on change I accept and applaud. Your scope relative to library technical services I find too limiting. What is to be done with such vital matters as binding? Conservation and preservation of materials? Even SLA is providing space for such topics.—Paul J. Fasana, Preparation Services, New York Public Library, New York, New York.

CATALOGING NONBOOK MATERIALS

The cataloging of nonbook materials and revision of Part III of the Anglo-American Cataloging Rules are at present the major concerns of the code's four authors, who meet regularly at ALA conferences to decide upon additions and changes to the AACR. The Canadian Library Association, through its Committee on Revision of the Anglo-American Cataloging Rules, is working with Jean Riddle Weihs, Shirley Lewis, and Janet MacDonald, authors of Non-Book Materials, on a two-pronged project to revise their manual and formulate basic principles of entry and description for incorporation into Chapter XII. The Subcommittee on Rules for Cataloging Machine Readable Data Files, under the chairmanship of John D. Byrum, Jr., has been carefully studying the problems of developing rules for cataloging this new medium of publication and will soon be forwarding recommendations to the parent Descriptive Cataloging Committee. Closely coordinated with both projects is the work of the Media Cataloguing Rules Committee of the (British) Library Association. Its working parties on films, graphics, sound recordings, and computer records have examined the problems peculiar to their respective media and contributed working papers reviewed at the Midwinter meetings by representatives.
of the Library of Congress as well as members of the cataloging committees. RTSD is planning to bring catalogers and media specialists a more detailed progress report in its program meeting for the 1972 annual conference.—Mrs. Elizabeth L. Tate, Chairman, ALA/RTSD/CCS Descriptive Cataloging Committee.

NELA PRECONFERENCE: SUMMARY OF RESULTS

The School and Library Promotion and Marketing Committee of the Association of American Publishers sponsored a daylong acquisitions preconference for about eighty librarians, publishers, and wholesalers on October 6, 1971, at the request of the New England Library Association. The topic was “Publishers' and Wholesalers' Catalogs and Brochures.” This preconference was intended to treat a specific kind of acquisition subject in detail, rather than present a broad look at the acquisition process.

Librarians generally agreed that announcement and backlist catalogs are useful as alerting devices or memory-ticklers, but it was apparent that the various kinds and sizes of libraries use catalogs and other direct mail pieces in different ways. Other points on which there was strong general agreement include the following:

1. Heavy duplication of a mailing not only wastes the time and money of librarians and publishers, but also gives librarians a bad impression of the publisher's efficiency;
2. Catalogs and brochures should include Library of Congress card numbers, Dewey Decimal classification number, and International Standard Book Numbers. In addition, accurate information about authors, title illustrations, price, and the like is essential;
3. Forthcoming titles should be clearly identified as such, and lists of titles in series should be provided;
4. Publishers participating in the Cataloging in Publication Project were urged to identify titles that will carry CIP information so that librarians can anticipate the early availability of books and CIP data;
5. Primary concern was expressed for accuracy and completeness of information, and ready access via indexes to this information in trade catalogs; the use of color and illustrations in catalogs is of lesser importance. Publishers were urged to enter accurate descriptive information in standard book trade reference sources such as Publishers' Weekly, PTLA, and Cumulative Book Index;
6. Many librarians noted the value of wholesalers' catalogs. They feel assured that books have actually been published when they see the titles included and they appreciate these single sources that gather otherwise scattered information;
7. Order forms in catalogs generally are not necessary or useful to librarians; and
8. Although there was no consensus about a “best” format, there was some agreement that the size of catalogs and mailing pieces should be appropriate for typical library files—either of the 3x5 inch size or designed to fit into standard pamphlet boxes of file drawers. Several public and children's librarians “like” poster advertisements for display, but their title selection is not generally influenced by these mailings.

Volume 16, Number 2, Spring 1972 • 269 •
RLMS' PLANS FOR LAS VEGAS ALA CONFERENCE

The RTSD Reproduction of Library Materials Section (RLMS) is soliciting advice on the selection of topics related to the reproduction of library materials, their production, storage, and use for the discussions at the ALA Las Vegas Convention in 1973. We are particularly interested to hear from anyone experiencing difficulties in the administration of photo-reproduced materials, and from those who either experiment with new methods or are involved in related research. The section would like to consider panel discussion, presentation of papers on research in progress, and demonstrations of new techniques. We hope to involve users, practicing librarians, teachers, students, and members of industry working in the field of reproduction of library materials. Your willingness to participate in person, or your recommendations of others interested in this field will be most sincerely appreciated. Please write to: Mr. Joseph Z. Nitecki, Vice-Chairman, RLMS, Paley Library, Temple University, Philadelphia, PA 19122.

INTERNATIONAL STANDARD BIBLIOGRAPHIC DESCRIPTION

The American Library Association through its Descriptive Cataloging Committee has accepted in principle the International Standard Bibliographic Description, as has the Cataloguing Rules Committee of the Library Association. The modifications the ISBD will necessitate in the Anglo-American Cataloging Rules are currently under study by both organizations and the Library of Congress.

The purpose of the standard has been described in the words of A. H. Chaplin:

It is designed primarily as an instrument for the international communication of bibliographical information. By specifying the elements which should comprise a bibliographical description and by prescribing the order in which they should be presented and the punctuation by which they should be demarcated, it aims at three objectives: to make records from different sources interchangeable; to facilitate their interpretation across language barriers; and to facilitate conversion of such records to machine-readable form.

The International Standard Bibliographic Description (for Single Volume and Multi-Volume Monographic Publications) recommended by the Working Group on the International Standard Bibliographic Description set up at the International Meeting of Cataloguing Experts, Copenhagen, 1969 (London: IFLA Committee on Cataloguing, 1971) may be purchased from the Order Department of the American Library Association, 50 E. Huron St., Chicago, IL 60611 for $2.50 per copy.
REVIEWS


This Manual, with its accompanying file of cross-reference cards (over 1,300, according to the publicity), would appear to be a useful tool for the small library. The emphasis, however, must be on small, since the List of Subject Headings includes only about one-third of the terms enumerated in Sears which is itself designed for the small- or medium-sized library. In his “Introduction” the author sets forth the aim of his work which is “to provide the growing school library with an ‘instant’ and complete network of cross references.”

The subject headings used on the cards and consequently in the list are taken from the Standard Catalog series; they are therefore in accord with those used on Wilson cards, and “the cross references and notes are consistent with those in Sears List of Subject Headings, 9th edition.” This then should give the prospective buyer the scope of the List.

If a card is received using a subject heading not included in the List, one is instructed to turn to Sears. If that fails, Woods suggests the following: “One solution is to just file the card, pencil the heading in the subject list, and make a mental note to complete the indexing in several years when a new edition of the List is published. Another course is to consult a dictionary for synonymous and related terms as an aid in devising cross-references . . . Consult if available, the Library of Congress Subject Headings and supplements . . .” (italics mine).

The headings, with few exceptions, e.g., “Satellites, Artificial” rather than “Artificial satellites,” and “Water conservation” instead of “Water—Pollution,” are the same in choice and structure as those in Sears. As a convenience, some names and their cross-references, not usually included in subject heading lists, are given here, e.g., Galileo Galilei, Leonardo da Vinci, John Chapman (Johnny Appleseed), Lief Ericsson (entry word underlined). One name, John Henry, given in the introduction as an example of this practice, is omitted from the list. One might wonder why the AACR is not being followed in the case of Galileo and some corporate names, e.g., “U.S. Air Force Academy,” “U.S. Peace Corps,” but the fact that the List and cards reflect Wilson practice no doubt explains this.

The primary purpose of the List, as we understand it, is to provide a checklist for the headings already selected, and for the cross-references supplied, rather than to serve as an aid in selecting the headings and cross-references to be used. Though the List could of course serve this purpose, the fact that this is a secondary function no doubt accounts for the absence of such usual features as a list of standard subdivisions and categories of terms to be supplied. That terms are to be supplied is indicated indirectly in the instructions and made clear from general references that names of persons, places, animals, flowers, sports, and the like are to be added as needed. Wisely there are actually few general references, which makes good sense for a small collection. Perhaps some that are included should be made specific! There are virtually no scope notes, and in some instances this is unfortunate, even for a simple list. Another usual
feature which is almost entirely eliminated here is that of geographic subdivision. This of course reflects the purpose of the List of serving the small library, and the author's policy is sound. The only serious error we caught in the List was in this matter of geographic subdivision. In one instance where such subdivision was meant to be used, "Folklore—U.S.," there was no entry, though there was a see reference from "U.S.—Folklore." The entry at "Folklore, Negro" traced a see reference from "U.S.—Folklore," though none was made, and a see reference from "Negro folklore" was made but not traced.

This second edition has an increased list of headings and some seventy-one additional cross-referencing cards. It also supplies suggested Dewey (9th abridged) numbers and gives a clear explanation of how to use the List and the cards. Because the cards are really the unique feature of this work and the main reason for obtaining the Manual we should consider their use. Since all possible see also references are included on the cards, how to handle not-yet-used headings becomes a problem. The author suggests three solutions: (1) File only the cross-reference cards relating to subjects in the collection. In cases where a card refers to several subjects, one or two of which may not yet be represented in the catalog, a mark should be made to indicate this fact; (2) file all the cards regardless of whether or not subjects are represented in the catalog; (3) file only those cards for topics represented in the catalog, but make no effort as in (1) to indicate unused subjects. Although the first requires more work than the other two—but less than doing it all yourself!—it is more accurate in that it identifies (hopefully!) subjects not yet used which the borrower should not search. The second alternative does not seem acceptable. The third is a compromise, better than the second, but not so good as the first, since it too would produce blind cross-references which make for frustrated borrowers and will create a credibility gap difficult to bridge. Some years ago there was an article entitled: "Cross References Make Cross Readers." Mr. Woods, take note!

Although we do not know any libraries that are using this service, the fact that there is this new edition suggests that it has some followers. In these days of staff shortages and, for the small library at least, limited professional and/or clerical assistance, this Manual with its cards could prove a good investment.—Margaret Kaltenbach, School of Library Science, Case Western Reserve University, Cleveland, Ohio.


I highly recommend the purchase of this volume for anyone considering participating in centralized processing. It is actually the second volume of Centralized Book Processing, by Leonard, Maier, and Dougherty. That fact is probably the only real drawback in terms of format. This volume is larger than the other, rather expensive, and some of the tables in the "Appendix" are difficult to read. For looking up bibliographic references, the first volume (which is the theoretical preview of the operation) is necessary. However, references to correspondence and personal communications are given. Of the 254 pages, 121 are text; the rest are tables.

This book is so valuable because it seems to be an honest appraisal of what happens between theory and practice. What parts were overlooked
in the study, where some of the pro-
cedures broke down or failed, and
what human problems occurred are
documented in this volume; it can,
therefore, serve as a warning to other
libraries studying the feasibility of
centralized processing. There are very
few authors in the library field who
have had the courage to provide such
data or have scrupulously studied
their operations on a cost/effectiveness
basis as have Dougherty and Maier. At the 1971 ASIS convention
in Denver, Dr. Boulding said in ef-
effect, when speaking of the economics of
information, that we learn only
(or primarily) from failure or from
negative events.

The overall objectives of the ex-
periment were: "1) to calculate proc-
essing costs; 2) to measure lag-times
from the time an order left a partici-
pating library until the book was de-
ivered; 3) to investigate consumer
acceptance of products provided in
relation to pre-agreed upon process-
ning specifications; 4) to observe the
problems of interface between the
Center and its users (from the point
of view of administration, public rela-
tions, and operating procedures); and
5) to determine the congruence of
approval plans presently used at two
institutions."

Among the folk mythology ex-
plored was that of "higher discounts"
and "faster service from jobbers." It
was found, moreover, that partici-
pants were prone to overemphasize
errors; that there were some horren-
dous accounting problems; that total
dependence on machines should be
carefully monitored; that the human
element and customer relations were
extremely important; and that dif-
ferences in library philosophies can
create unexpected problems.—Henry
Voos, Rutgers—The State University,
Graduate School of Library Service,
New Brunswick, N.J.

Wilson, T. D. An Introduction to
Chain Indexing. London: Linnet
Books & Clive Bingley, 1971. (Pro-
grammed texts in library and in-
formation science) 85p. $4.25.

The author of this programmed
text is principal lecturer at the De-
partment of Librarianship of New-
castle-upon-Tyne Polytechnic. His
book is intended as an "elementary
introduction" and is a clear, concise
explanation of how to construct an
alphabetical subject index to a classi-
fied catalog using the chain index
method. Designed to be used with the
17th edition of the Dewey Decimal
classification, this text makes an
interesting exercise in determining
subjects through classification. The
chain is taken from the classification
scheme and becomes a semi-automatic
process relying upon the hierarchy
of the classification and using the
terminology of the scheme as a foun-
dation. Its function is to complement
the classified section of the catalog by
translating the natural language terms
into the unfamiliar artificial notation
of the scheme.

An example of the successful ap-
plication of this type of indexing may
be found in the British National Bibli-
oography prior to 1971 and the author
has reproduced parts of BNB's chain
indexes in his text. However, he fails
to mention that in 1971 the computer
took over the compiling of BNB, that
the 18th edition of Dewey is now
being used in the classified section,
and that PRECIS (Preserved Context
Indexing System) is now being used
for the subject index.

Dr. S. R. Ranganathan, with whose
name chain indexing is usually asso-
ciated, is the author of the foreword.
He states "During the last thirty years
the chain indexing method has been
continuously refined to meet the re-
quirements of micro subjects. This
process of refinement has opened up an apparently never-ending line of research for catalogers. This in itself is a great merit of chain indexing."

Programmed texts used to supplement lectures are an excellent learning device. The student is able to proceed at his own rate of speed and test his own comprehension of the principles involved. The author closes with the statement: "Many of the problems that occur cannot be formalised very easily and, hence, depend for their solution upon the flair of the indexer. But with this text as a basis, the indexer should be better placed to exercise that flair."—Frances R. Ladd, Catalog Department, University of Rochester, Rochester, New York.


This report prepared by the Library Administration Division of ALA and funded by the National Center for Educational Statistics (USOE) is important reading for everyone who collects, produces, or uses library statistics. "Some of the recommendations made by the ALA project (this study) have already influenced NCES's program and planning. Other recommendations are being given careful consideration." (p.ii)

The basic proposal is that NCES devise a single multipurpose questionnaire to collect data from public, academic, special, school, state, and federal libraries as well as from library schools. These data would provide annual national statistics for each type of library and also give information on libraries and development programs at the local, state, and federal levels.

More detailed surveys by type of library at longer intervals are recommended, but their implementation depends on a number of unresolved factors including funding.

One excellent proposal is that all agencies concerned with library statistics be involved in the system. NCES would consult with professional associations, other federal agencies, the National Commission on Libraries and Information Science, research institutes, and state agencies regarding content of the basic questionnaire, development of forms for national and state purposes, and standardization of terminology. NCES would assist the states in collecting data by writing instruction manuals and funding regional training workshops. The states would collect and edit the completed forms and forward the data required by NCES to Washington. Information collected for state purposes would be published by the states using uniform tables designed by NCES.

Contributors to this project identified fourteen basic statistics to be collected annually from six major types of libraries plus library education. However, they agreed unanimously on only four statistics: salaries, staff size, population, and expenditure by type. All categories except library education required information on book stock, periodicals, microforms, nonbook materials, and interlibrary loans. The importance of the remaining five items—hours, circulation, outlets, income by source, and reference—varied by type of library. Data on fringe benefits and physical facilities would be gathered quinquennially.

An examination of federal and state statistical reports reveals that the fourteen annual basic statistics have essentially been collected in the recent past and have also been der-
ogated for not presenting a meaning-
ful picture of library operations or
services. For example, one can inter-
pret high or low figures for holdings
and interlibrary loans in opposite
ways. Circulation figures can be al-
tered by varying the length of the
loan period or offering books which
titillate public tastes.

The report recommends a Na-
tional Statistical Depository "To pro-
vide a central resource for all engaged
in library statistics research, . . . "
(p.12) This is an ambitious proposal
since major considerations in plan-
ing any data reporting system are
to define: Who needs the data? What
information is needed? How will these
data be used? An additional factor is
whether these statistics can be eval-
uated in terms of the objectives and
functions of the various library cate-
gories. Although a few of the con-
tributors raised, but did not answer,
these crucial questions in their in-
dividual position papers, the project
as a whole has failed to come to
grips with these basic problems.—El-
len Altman, Bureau of Library and
Information Science Research, Rut-
gers University, New Brunswick, New
Jersey.

Stone, Elizabeth W., ed. "Personnel
Development and Continuing Ed-
ucation In Libraries," Library
Trends. University of Illinois
Graduate School of Library Sci-
ence, Volume 20, Number 1, July
1971. $2.50.

Unlike many issues in this valua-
table series this work is not so much a
review of current literature and prac-
tice as it is a plea for better pro-
grams of continuing education in the
field.

Following a thorough overview of
the demands of a desirable system of
personnel planning by Robert and
Charlene Lee, the present inade-
quacies of personnel develop in
four critical areas are explored.
Charles Goodman presents a general-
ized discussion of the problems and
difficulties in employee motivation.
Maurice Marchant discusses his own
research in participative management
in university libraries and suggests a
heuristic model of university library
operation which includes managerial
style, wealth, breadth of staff educa-
tion, collection size, and staff satisfac-
tion as elements affecting faculty
evaluation of library service. Ernest
DeProspo reviews the practice of per-
sonnel evaluation and finds it largely
oriented toward insuring employee
efficiency but unable to measure or
point the way toward employee ef-
effectiveness in terms of goal accom-
plishment. David Kaser reports on an
examination of university libraries
and finds that while there is time
and money being spent on continuing
education, efforts thus far fall short
of constituting a training subsystem
within the library's personnel utiliza-
tion program. Lawrence Allen and
Barbara Conroy outline relevant re-
search on learning methods and sug-
gest that experiential learning which
has been little used in library educa-
tion offers the best hope for increas-
ing the social effectiveness of library
staff members.

In two papers subcommittees of
the LAD/PAS Staff Development
Committee present material resulting
from their work. The first presents a
model for continuing education and
personnel development in libraries
which aims at integrating the staff
development function with the proc-
cess of establishing organizational goals
and objectives. The second paper sug-
gests guidelines for staff development
and recommends roles for state
agencies, the U.S. Office of Education,
library schools, and state and national library associations.

Gaver, utilizing a small research effort and other research discusses the personalized criteria with which librarians approach the function of continuing education. Harvey and Lambert catalog current programs of continuing education and attempt to suggest some of the strengths and weaknesses of each. Perhaps because it tried to do so much, this paper was for this reviewer the weakest in the issue. Peter Hiatt calls for a national effort aimed at developing programs of continuing education which would reach to every level of employment in libraries. Hiatt believes that ultimately responsibility for such a program should rest with ALA but recognizes that this is not presently possible. As an interim step he suggests using the program of continuing education being developed under the auspices of the Western Interstate Commission on Higher Education (WICHE) as a testing ground to develop a program which could later be implemented on a national scale.

What does all of this mean? In short, it would seem that future efforts at planning, designing, and implementing programs of continuing education will need to start with this symposium. Certainly it does not answer all questions, but it does bring into clear focus most of what is known and not known on this topic which librarians so earnestly discuss and about which so little has been done.

—F. William Summers, Graduate School of Library Science, University of South Carolina, Columbia.
The following abstracts are based on those prepared by the Clearinghouse for Library and Information Sciences of the Educational Resources Information Center (ERIC/CLIS).

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Institution: Fisk Univ., Nashville, Tenn.

This handbook attempts to answer most questions raised about the organization and retrieval of black materials. The handbook is the outgrowth of discussions of classification and cataloging at the Institute on the Selection, Organization, and Use of Materials by and about the Negro. It is aimed primarily at college libraries using Library of Congress classification and subject headings, although there is some discussion of the provisions of Dewey as compared with those of Library of Congress. Neither of these classification systems provides adequately for black materials. A detailed examination of the Library of Congress subject headings is presented.

Institution: Lockheed Missiles and Space Company, Palo Alto, Calif. Research Laboratory.
Sponsor: Office of Naval Research, Washington, D.C.

The development of automatic indexing, abstracting, and extracting systems is investigated. Part I describes the development of tools for making syntactic and semantic distinctions of potential use in automatic indexing and extracting. One of these tools is a program for syntactic analysis (i.e., parsing) of English; the other is a dictionary of English word government patterns. Part II reports on the research program in describing and abstracting pictorial structures. This work is concerned with whether it is possible to construct a symbolic representation of a gray-level picture which can provide essentially the same information as the picture itself. Based on a series of experiments using human subjects describing aerial terrain photographs, it was possible to make certain observations concerning deductive and metadescriptive aspects of description, i.e., the "set," contextual knowledge, and certainty of the subject.

Evans, Frank B. The Selection and Preparation of Records for Publication on Microfilm. 1970. 17p. ED 052 797. MF $0.65, HC $3.29.
Institution: National Archives and Records Service (GSA), Washington, D.C.

The purpose of these guidelines, which are based upon approved standards and practices, is to help insure the archival quality and the usefulness of microfilm publications. Included are guidelines for determining the suitability of a body of records for microfilming, arranging and processing the records, determining roll breaks, pre-
paring insert pages, preparing special instructions to the camera operator, inspecting the negative film, and preparing a descriptive pamphlet.

Institution: George Peabody College for Teachers, Nashville, Tenn. School of Library Science.
An investigation was made of the Nashville Union Catalog to explore the possibility of its expansion into a regional catalog forming the nucleus of a bibliographic center for the state. The primary objectives were investigation of (1) the catalog and its format possibilities; (2) structural organization, and required funding for an operation involving many libraries of different types; (3) access to the union catalog, and service from it. The recommendations included continuation of the present card form, inclusion of cataloged items from all types of libraries, submission of funding requests to likely sources for computerization of acquisitions, expansion of the operation into a bibliographic center with initial service to local libraries but with a view toward expanding statewide.

The Joint Serials Control System includes a total of thirty-eight libraries on three campuses. Twelve have independent technical service units for processing serials and twenty-six are dependent libraries. The objectives of Phase I of this project were to identify feasible alternative system configurations and provide a basis for their evaluation so that the contract libraries can select the most workable configuration for intensive design in Phase II. The alternatives must take into consideration three major factors: (1) requirements of the contract libraries, (2) implications of state and national standards, and (3) the state-of-the-art of automated library applications in general and serials control systems in particular. This final report is presented in five sections: (1) conclusions and recommendations, (2) literature review summary and conclusions, (3) report on selected noncontract libraries and other organizations, (4) analysis of current systems at the contract libraries, and (5) alternative system configuration costs.

Related document is ED 028.801.
This report prepared for the Five Associated University Libraries (FAUL) is divided into nine sections: (1) a summary of procedures used to accomplish specified MASFILE-II tasks; (2) a graphic comparison of MARC-II and MASFILE-II formats; (3) modifications to the FAUL MASFILE-II record needed to transmit records from the MASFILE computer to local terminals or line printers in the MARC-II format; (4) data elements which must be resident in a MASFILE-II record to produce products as specified by the FAUL Systems Committee; (5) workable procedures for each FAUL Library to modify MASFILE-II records in a central computer on a routine basis; (6) workable procedures for adding current local records into MASFILE; (7) methods for identifying and selecting specific records and groups of records from MASFILE to produce lists organized by subject, class number, or main entry; (8) major problem areas resulting from this project and (9) a summary of time spent and activities.

278

*Library Resources & Technical Services*
performed in computer testing, program runs, clerical operations, and professional time.

**A Model Budget Analysis System for Program 05 Libraries.** March 1970. 30p. 
ED 051 866. MF $0.65, HC $3.29.


Prepared by the Interinstitutional Committee of Business Officers, this paper attempts to determine modular figures for three main facets of the library program: (1) acquisition of library resources, (2) technical processing of those resources, and (3) services to the public using those resources. The system includes the following components: (1) A Library Resources Formula which takes into account both enrollment and program factors and is similar to the approach developed by Clapp and Jordan; (2) staffing formulas which relate public service staff to the demands for service and the technical processes staff to the materials which require processing and which compare Washington state libraries to those in the University of California system; (3) a minimum percentage increase factor for acquisitions and, for formula purposes, a maximum percentage limitation on weeding; (4) procedures for converting resource and manpower requirements into dollars which allow for changing market conditions; and (5) procedures for computing binding and other operational costs. The proposed system relates closely to the long-range planning process since it enables each institution to estimate its requirements for future library resources and staffing, once the factors of student enrollment, faculty staffing, and graduate programs have been determined for any given year.

**Moriarty, John H., and Seibert, Warren F.** *A Suggested Methodology for Relating Research Collection Criteria to Disciplines and to Educational Program Quality.* December 1968. 20p. ED 051 834. MF $0.65, HC $3.29.

Institution: Purdue University, Lafayette, Indiana. Libraries and Audio-Visual Center. 

The growing pressures and complex conditions which now bear upon research libraries are not adequately reflected in the development of policies, plans, or current service activities. Librarians seem to operate normally on the basis of only a few guidelines and these typically are rather outdated, arbitrary, and indiscriminate, especially in the way they seek to serve the various special fields represented in research. Improvement in the adequacy of plans and decisions could be expected by systematically accumulating and disseminating new and descriptive information on the broader environment of research libraries.


Institution: Massachusetts Institute of Technology, Cambridge. 

Related documents in this series are ED 036 299, ED 086 301, ED 043 548, ED 047 739.

Libraries should resist the temptation to relinquish to computing centers the burden of looking after the university's digital data record resources because a growing volume of important material will arrive at the university on digital data tapes. If the user must arrange for access to this material outside the library, he will be seriously disadvantaged. When a library assumes responsibility for digital data record resources, the selection of access techniques becomes the central question. The use of interactive techniques in which the user is in direct communication with the data file, combined with full-text displays is described. The Model Library Program, discussed in Section III, deals with procedures that assist the user who seeks information in a
mixed regime of machine access techniques and conventional library operations. The program's objective is to examine system configurations from the viewpoint of cost-benefit relationships and to study interrelationships among factors such as data-base size, content and cost, user population, equipment utilization, hardware considerations, and networking through use of electrical communications.

Institution: Purdue Univ., Lafayette, Ind. School of Industrial Engineering.
Sponsor: Purdue Research Foundation, Lafayette, Ind.

This paper shows that for a given collection of books of various sizes, the optimum number of shelf heights can be determined by finding the shortest path in an equivalent network. Applications of this model to inventory control, assortment, and packaging problems are also given. An extension of the basic model which minimizes the wasted shelf space in libraries is also discussed.

Institution: Organization of American States, Washington, D.C.
The resolutions of the 15th Seminar on the Acquisition of Latin American Library Materials (SALALM) cover the following topics: (1) Acquisitions Matters; (2) Reproduction of Library Materials and Computer Technology; (3) Archives and Manuscripts; (4) Bibliographic Matters; (5) Library Organization, Personnel and Research; (6) SALALM Organizational Matters.

The aim of this report is to study the feasibility of establishing university library systems, based on cooperation and compatibility, which are capable of utilizing all advances in educational theory and modern technology without sacrificing any relevant features of the traditional library. The application, present problems, and cooperative possibilities of five areas are explored. There are: (1) acquisitions service, (2) cataloguing services, (3) circulation services, (4) document retrieval services, (5) personnel services, and (6) equipment.

Sponsor: National Science Foundation, Washington, D.C.

This dissertation from the University of Chicago sought to answer whether broad or narrow terms function more effectively in the retrieval of relevant documents. The answer depends on what the user wants, his wants being expressed in terms of stated precision-recall preference, or by the exact number of relevant documents he wishes to retrieve. Depth of indexing does not contribute significantly to effective retrieval. Documents indexed with broad terms satisfy recall preferences. Documents indexed with narrow terms satisfy precision preferences since the amount of material retrieved in a system is not a simple function of the total numbers of terms posted to documents in the collection. At high cut-off values the retrieval power of broad and narrow terms tends to become equalized. Precision can be improved through raising the cut-off point and deleting broad terms. Experiments with weighted indexing pro-
vided poor results, while title-term indexing gave inconclusive results.


Institution: Rand Corp., Santa Monica, Calif.

The advantages and disadvantages of both card catalog and book catalogs are considered. It is concluded that it is not economically sound to plan on a book catalog unless many copies are required or the unusually high per-copy costs for a small number can be justified.

Wingate, Henry W. *Cataloging-In-Publication: Problems and Prospects*. 1971. 16p. ED 053 752. MF $0.65, HC $3.29.

The interest in cataloging-in-source was revived during the twentieth century, with the most important experiment being that of the Library of Congress which concluded the program could not be justified from the viewpoint of financing, technical considerations, or utility. A new program has been developed which poses many problems and has far-reaching implications for all libraries. The largest problem is that of cooperation with individual publishers. The publishers, the Library of Congress, and the libraries which will use the entries must all cooperate and find a program consistent with their individual objectives. A more critical attitude on the part of those involved and a more objective examination of the problems are also required to ensure success.
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