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Recent Trends In Rare Book Librarianship

MICHELÈ VALEIRE CLOONAN

Issue Editor

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Introduction

MICHELE VALERIE CLOONAN

Thirty years ago Howard H. Peckham compiled an issue for this journal on the topic of rare book libraries. In his introduction he could propose that: "To devote an issue of Library Trends to rare book libraries and collections is clear recognition...that there is no extensive literature on the subject."¹ The number and scope of articles (and their sources) in this issue demonstrate that today the lack of "extensive literature on the subject" is no longer an operable phrase. In 1957 the apparent paucity of information on rare book librarianship was justification for a journal issue; in 1987 the flood of information calls for a reevaluation. A little wave has turned into a tsunami.

The chief difficulty now lies in establishing parameters. Koda points out that the 1957 issue "reflected a preoccupation with the concept of rare books and with the development of collections. During the ensuing years no one has provided an entirely satisfactory definition of rare books, but then it is not the issue that it seems to have been in the 1950's." (Indeed, the term special collections is preferred by some as is illustrated by the titles of articles in this issue.) Today the profession's concerns range widely to include computers and scientific equipment, standards, bibliographic control, fund-raising, preservation, ethics, security, and literary rights, as well as the increasing role of rare book collections in the humanistic disciplines. The history of the book has also emerged as a discipline; its pervasive and changing scholarship is considered by Koda, Schwab, and Ferguson.

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A single journal issue cannot treat all of these topics, though the collection of essays presented here does cover a remarkably broad range. The issue is divided into five sections. In part I., an overview, Berger's article—as an introduction to the field—provides a survey and bibliography of the key issues in the profession over the past fifty years, starting, appropriately, with Randolph Adams's classic, "Librarians as Enemies of Books." By happy coincidence, this issue marks the fiftieth anniversary of its publication. The next four sections are as follows: II. Advances in Scientific Investigation and Automation; III. The Practice of Rare Book Librarianship; IV. The Funding of Rare Book Collections and Programs; and V. The Preservation of Meaning and the Protection of Objects. The aims here are to highlight the various aspects of the rare book profession and to introduce some of the newer subdisciplines.

Section II. covers the scientific investigation of artifacts by bibliographers and other scholars, and the role of automation in rare book librarianship. Abt opens the section with an historical overview of the impact of science on the physical examination and treatment of books. Describing four categories of equipment in use for the physical examination of books, Koda stresses the need for scientific analysis alongside the traditional approaches of philology, textual studies, and history. Schwab also discusses this concept of teamwork in bibliographical research, as he describes historians' and physicists' use of the cyclotron at the University of California, Davis. Invaluable information on the production of the Gutenberg Bible has emerged from this collaboration. Woodward considers the scientific analysis of paper and ink in early maps. He too emphasizes the importance of collaboration and of the careful evaluation of technique(s). All three authors stress the importance of protecting artifacts from irreversible damage and of the thorough preparation of artifacts before testing can begin.

Automation has become an integral part of operations in most libraries, perhaps most significantly for bibliographic control. Davis deals with recent advances in this area, but also points out that computers "have the potential of returning us to the dark ages of purely local practice in terms of cataloging and automation standards. Use of the bibliographic utilities has gradually imposed a basic consistency and standardization upon catalog records—something they never had before in special collections." Thomas discusses in detail the various extant cataloging standards, "why they are needed; how they evolved; and how they may continue to evolve."

"The Practice of Rare Book Librarianship" in section III., includes articles on the careers of rare book librarians, and rare book librarian-
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ship in three different library settings: university, college, and public. Traister evaluates the stereotyping of rare book librarians, and makes observations about possible new directions for the profession. He proposes, for example, that the "emergence of the conservator and the conservation administrator as a force within both special collections and the larger library world, and as a potential bridge between the two, has long-range implications which have hardly begun to be felt"—a sentiment also reflected in the Cullison/Donaldson article.

Although there are no articles in this issue devoted exclusively to the Rare Books and Manuscripts Section of ACRL, one cannot overemphasize its importance in the rare book profession. Its committees have produced essential standards and guidelines, many of which are mentioned on these pages by RBMS members and nonmembers alike. Through its annual programs—the first of which was held in 1955—RBMS has addressed both practical and theoretical issues. The growth of RBMS from a small committee to a section of ACRL that in 1984 had nearly 1300 members has led to new publishing ventures. In 1986, for example, RBMS inaugurated the journal, Rare Books & Manuscripts Librarianship, "in which a discussion of the principles, practices, questions, and issues of special collections can take place, since no other journal is given over exclusively to such discussion."

Ferguson, Antonetti, and Linard examine rare book librarianship at institutions of the type in which each works. Ferguson proposes that "rare books in university libraries have been supported on a continuous basis...in contrast to book collections in public libraries or in independent research libraries, which are suffering today because of lack of resources." What has changed, he contends, is the climate of the university library as well as the managerial style. At present, librarians view themselves as information specialists, and in many cases the rare book connoisseur, as head of special collections, has been replaced by an "administrator" with special skills in areas such as grantsmanship. Ferguson also observes that many specialists whom the curator now calls upon would have been almost unknown thirty years ago: book and paper conservators, computer professionals, public relations specialists, and police agents specializing in art and book thefts.

Antonetti and Linard reflect on their own institutions as examples—not prototypes—of special collection departments in college and public libraries. Antonetti illustrates how a special collections department can have a strong teaching function. Linard considers yet another role that a special collections department can play through community outreach programs.
Funding is the subject of section IV. Streit reports the findings of a questionnaire on funding patterns for rare book acquisitions distributed to 164 libraries, including all ARL libraries. His high return rate (136 or 83 percent of the libraries surveyed) suggests current interest in the areas of budgeting, fund-raising, and library support groups. Streit concludes with the observation that “despite difficult times characterized by small budgets, competing interests within the library, and unstable growth patterns, most of those...who...build rare book collections are gamely looking ahead toward better days.”

Child discusses the support of the National Endowment for the Humanities (NEH) for special collections. Over the past fifteen years, NEH grants have had a major impact on special collections, particularly in the areas of preservation, cooperative microfilming, building and renovation programs, cataloging, and the compilation of bibliographies and other scholarly reference works. She emphasizes the impact of the Challenge Grant program, originally “devised as a means of helping institutions to help themselves: by providing operating funds to tide them over immediate financial crises, by increasing their endowments through fund-raising in the private sector with the incentive of an NEH grant to spur contributions, and by reexamining the ways in which their endowments were invested and managed.”

The final section, “The Preservation of Meaning and the Protection of Objects,” is devoted to preservation and security. The term preservation of meaning, which I adapted from a conference held at the Harry Ransom Humanities Research Center, the University of Texas at Austin in 1986 on the “conservation of meaning,” is suggested in the Cullison/Donaldson article. “Preservation of meaning” refers to the physical integrity of objects. The physical evidence of books, for example, can be lost through ignorant or insensitive conservation treatments. In order to determine the best treatment for library materials, conservators and curators must understand the physical makeup of an object as well as its political, social, bibliographic, and iconographic significance. Cullison and Donaldson discuss the need for a cooperative approach to the treatment of objects, which must be based on a strong body of knowledge on the part of both the curator and conservator as well as a respect for and understanding of each other’s disciplines. The need for this type of teamwork is still acute.

The other concern of this section is security. In the 1957 issue of Library Trends, this topic received scant mention in an article entitled, “Reader Policies in Rare Book Libraries.” At that time, Wyly points out, the topic of security was “neither a burning issue nor a trend. [However] the past thirty years have...witnessed a dramatic increase in...
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property crimes of all sorts." Wyly looks at major library thefts of the past twenty-five years and considers the notion of ‘loss of consciousness’ on the part of patrons, reading room personnel, and administrators. She describes the John Crerar Library case and cites it as a striking example of this phenomenon. The 1983 Oberlin Conference on Theft, BAMRAM, and the RBMS Security Committee are also mentioned. The protection of objects is necessarily an ongoing concern.

Considering the flood of interest and activity in the field—as the present essays substantiate—one may hope that Library Trends does not wait another thirty years to devote an issue to rare book librarianship.

I am grateful to the contributors for making this issue possible. Thanks are also due to the following for their suggestions: Terry Belanger of the Columbia University School of Library Service, and Susan Dingle and D.W. Krummel of the Graduate School of Library and Information Science at the University of Illinois.

This issue is dedicated to Valerie Galembert and Kathryn Gerlach, my first two rare book teachers.

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What is So Rare...: Issues in Rare Book Librarianship

SIDNEY E. BERGER

To point out that rare book rooms contain items which are possibly not rare and are not necessarily books, and that the rooms themselves may not even be rooms, is to show the protean and kaleidoscopic nature of the profession of rare book librarianship. An article on such a broad topic, covering the many aspects of this subject that scholars have written about and librarians and administrators have thought about seriously for nearly fifty years, will be more expository than profound. Although rare book collections have been in existence since long before the 1930s, only in the past fifty years has rare book librarianship become a profession under critical scrutiny and discussed in professional journals and books.¹

From 1937, the publication date of Randolph G. Adams's "Librarians as Enemies of Books," to the 1950s, a slowly increasing interest manifested itself in print. The 1960s and 1970s maintained a steady interest in the subject, but with different focuses. In the 1980s, with new understandings of how library materials deteriorate, with new tools for the care of books,² with computers and other scientific equipment, with new fields of analytical and textual bibliography, and with a great expansion in research and scholarship emanating from the growth of academic institutions worldwide, there is a new burst of energy—a new flood of publications—about rare book librarianship, again with some new focuses and some enduring old ones.³

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Generally the subject is divisible into two main and not always distinct areas: i.e., physical and theoretical. Librarians have been interested for decades in the acquisition, care, handling, storage, preservation, cataloging, classifying, and processing of books, as well as their circulation to users. On the theoretical side, there are also many issues; the earliest ones are still being wrestled with: defining "rare book," justifying the separation of rare book collections from others in the library, justifying large outlays of money for the purchase of what some people might call "useless" or trendy items for the rare book collections, and, in general, justifying the existence of a rare book collection in the first place. In the 1950s and 1960s, there were additional concerns: organizing the collections, funding, which areas of specialization the library should develop, and the roles of the rare book librarian, the patron, the administration, the dealer, and the collector. In the 1970s and 1980s, new issues (along with some of these older ones) have been under scrutiny: computer-assisted cataloging for greater access to the wider variety of information that scholars using rare books need, scientific approaches to dating, conservation and preservation of collections, theft prevention, and legal aspects of rare book librarianship such as appraisals and tax exemptions for book donors, and the "legal aspects of librarian-book collector relations."

The physical acts of acquisition and processing are closely related to the issues of the handling and care of rare books. In "Librarians as Enemies of Books," Adams mentions the

... treasure room of any one of a hundred public libraries [with its books with] bindings broken and poor cripples tied up with pink tape; you will find books cracking at the joints; you will find rare pamphlets in scuffed and dirty paper envelopes instead of slipcases; you will find books on the floor, where the janitor is sure to wet them with his dirty mop; and of course you will find books worn out by constant use at the hands of improper persons.

Though conditions may have changed in the fifty years since that was written, it is a picture that has been painted numerous times over the decades—along with issues of care, handling, preservation, and so forth. For example, Haugh describes all the handling a book gets from acquisition to its placement on the shelf. She discusses unwrapping, checking in, opening the pages (sometimes entailing cutting the pages), collating, insertions, photoduplication, ownership identification, bookplates, accession numbers, call numbers, spine labels, shelving aids, collation notes, and so on.

Naturally, to facilitate access to the item and to prevent theft, the standard practice is to mark the books. But some libraries try to minim-
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ize such marking because it reduces the value of the object. This is a major area of discussion for rare book librarians.

A good deal of writing has been done on preservation of library materials, especially important in rare book collections partly because of the age and/or value of the items, partly because many items have been exposed to the ravages of the modern age (smog and other air pollutants, humidity, parasites, excessive temperatures), and partly because of the acidic nature of the materials that many items are made of. Also, most rare book materials are either quite costly or irreplaceable.

Several manuals have been written on library preservation, focusing on the repair of already damaged volumes. Baker and DeCandido and Banks, on the other hand, call for a program of "preventive preservation," where the emphasis is on the collection as a whole. Collection surveys can also identify large-scale preservation problems; Walker describes the Yale survey, while Harris discusses surveys as well as other approaches.

More recent issues in rare book preservation consider the use of modern scientific equipment and research. Abt, for instance, mentions the application of forensics and the scientific analysis of paper and binding materials (see the article by Abt in this issue).

Another physical aspect of rare book librarianship concerns security and theft. Korey, for example, points out that there is an "alarming increase in the theft of valuable books and manuscripts." The Rare Books and Manuscripts Section (RBMS) of ACRL has established a security committee advocating what many librarians are now doing: marking books and manuscripts, joining Bookline Alert: Missing Books and Manuscripts (BAMBAM), a nonprofit database which is a "central location for records of missing books and manuscripts," helping pass legislation to enforce existing laws and create new ones specifically applying to libraries, and allowing for the recovery of stolen property. Other measures practiced now by many libraries are "[r]estriction of access to materials, positive identification of readers, and visible and indelible marking" of holdings. This is accompanied by many other efforts, including publishing information about losses, carrying prosecutions through, working with authorities, establishing a national registry of library markings, and so on.

French, VanWingen, and Wright claim that one of the responsibilities of rare book rooms is to offer reference services to scholars and to qualified members of the public—especially if the rare book collection is in a public, tax-supported institution. This brings up an issue extremely common that is both physical and theoretical—use. Theoretically, writers have spoken about who should have access to the various
kinds of rare book libraries, how that access was to be permitted, and for what reason. The basic use was for research, for the advancement of learning, and to perpetuate availability of historical and social records.

Many writers treated the physical use of materials in terms of their actual handling and the purposes to which the materials were put—overlapping with the notion that rare book librarians need to justify the existence of their collections. Many writers have had much to say about use, primarily because if a collection is not used, it is not justifiable. Baughman even points out that special reading rooms should be provided close to the rare book room circulation desk so that users can be observed and the volumes need not travel far from their shelves to the tables. Greater and easier use will attract more scholars, which in turn should generate more published scholarship. This enhances the reputation of the library, and thus makes it a more likely recipient of further bequests and additional funds (and possibly more of a target for book thieves?).

This theoretical concern of rare book collections—a justification for their existence—was quite strong in the 1940s and 1950s. Libraries needed to rationalize the expenditure of seemingly extraordinary amounts of money on rare items when other collections and facilities in the library were wanting. There were many justifications. Some pointed to the educational, social, and historical value of research; some pointed out that much of the funding came from private sources, donations, bequests, friends groups—money that would not otherwise have been available to any other branch or department in the library; and others stressed the many services that rare book rooms provide to society. This overworked topic prompted Thomas R. Adams to say in 1984 that there was no longer a need to justify the existence of a rare book collection.

Another theoretical and practical consideration of rare book librarians concerns money. Several writers pointed out their theories on how to keep the rare book funds coming in, and on why rare books are so expensive. Some showed practical, practicable, and proven methods for funding, including catering to a generous public in order to get gifts and donations, appealing to alumni and other extramural sources, having exhibits to spark public interest, and even outright advertising in public media. The many articles on drumming up support points to a constant problem for departments or libraries that deal with exceptionally expensive and precious materials.

One of the more interesting theoretical concerns focuses on the training of rare book librarians. Special collections present special
problems not encountered in other departments of a library. For example, the handling, evaluation, and supervising of a rare book facility require a different kind of knowledge from that of, say, an English library or a general facility. Silver’s essay is one of the more thorough treatments of this topic; he points out that rare book librarians need to offer users kinds of information not normally offered in regular catalogs—information like provenance, papers used in a book, binding styles and materials, and so on.33 The rare book librarian may need training in languages, special cataloging, preservation and handling, special kinds of acquisition (from dealers, private parties, and other libraries), knowledge in the subject specialties of his or her own library, love for books, and respect for scholarship.34 If the collection is strong in manuscripts, the librarian may need training in paleography.

The librarian must also be an administrator,35 or even a fund-raiser. McCrank adds that a rare book program should teach archives, organization of collections, and public relations.36 Cave’s informative chapter37 on “The Training of Rare Book Librarians” is encouraging: he says that at least the profession now recognizes the need for this specialized training and some library school programs are beginning to address this need. He mentions the study of foreign languages and paleography, and the history of books and libraries; the study of descriptive and analytical bibliography and booksellers’ catalogs; practical experience; a knowledge of preservation theory and practice and of the antiquarian book trade; and broad exposure to the reference tools of all countries represented in the books of his or her collection. Peckham adds that the rare book librarian needs training in dealing with dealers and at auctions.38

The rare book librarian should be encouraged to participate in the professional conferences in his field (the Rare Book Group of the [British] Library Association and the RBMS section of the American Library Association).39 Since Cave’s work over ten years ago, great advances in the computerization of bibliographic records have been made. A rare book librarian needs to learn about bibliographic utilities, online databases, and thesaurus construction (see discussion below regarding cataloging).40 Some of this extensive and specialized training will come on the job, and some will come from the programs emerging in library schools (see the article by Traister in this issue). Daniel Traister discusses some of the social/professional responsibilities of rare book librarians in “The Rare Book Librarian’s Day.”41 After the practical recounting of a day’s activities, he points up the theoretical approach to his position: the “idealistic” versus the “realistic” view of the profession. Rare book librarians must be aware of both—and must
be able to function well within the parameters of both. His closing remarks stress that the profession is a job requiring service to a public of scholars. The rare book librarian must understand this.

Two issues just raised (organization and cataloging) need special mention. Friedman discusses the organization desirable in the entire rare book field—between cooperating libraries. Such cooperation will benefit the profession in general and individual libraries specifically, for there will be a cross-current of information about sales, availability of certain items, stolen books, professional meetings, and so on. There is also organization within collections—a serious concern for rare book librarians. For instance, should the works of a private press be shelved together, or should they be distributed by subject matter throughout the collection?

Cataloging, as I have indicated, presents such special problems for rare book holdings that the RBMS Standards Committee has undertaken to create a thesaurus of MARC “formats for terms indicating the physical characteristics of material catalogued.” The document accounts for scores of physical characteristics of books which might be useful access points for researchers in rare book collections. Even before this organized and computer-assisted method was possible, cataloging had been a serious area of inquiry. Goodwin especially raises the questions of not only how to catalog rare books (i.e., what cataloging entries should contain) but also who should do it, the book’s owner or the bibliographic utility?

Rare book librarians must also face the practical and theoretical problems of weeding and disposal. No collection has unlimited space. Many writers deal with the handling of duplicates, books out of scope of the collection, obsolete items never used, and so on. Wright says, “special research libraries...should devote more thought to the elimination of useless items”; but he then adds that this is a sensitive issue because “[t]he rubbish of one generation may be the valued social documents of the next.” The rare book librarian has difficult decisions to make about what materials to retain in a collection.

Closely related to this—and another major concern for rare book librarians—is what to do about donations to the library, especially ones with strings attached. Peckham says: “Gifts are usually a boon, yet sometimes a problem.” Rare book librarians must be good at public relations in order to draw good bequests to the collection. Wolf points out that “Creating an Image” is one of the rare book librarian’s most important duties, as the history of the growth of the Library Company of Philadelphia demonstrates. His main piece of advice for developing a collection is, “keep the image of your institution in the media”; and “it
helps if the librarian is a known civic 'character.'" Such notoriety can bring bequests to a library. But as several writers bemoan, some bequests come burdened with conditions which must be met. While some "gifts to a university have often been the incentive that brought a rare book program into existence," many come with the provision that they must be kept intact; a large collection with only a few desirable items is a serious problem. Wright says that there is nothing wrong with turning down gifts. The rejection of gifts, of course, requires tact. Sometimes a monstrosity has to be accepted in order to get some really valuable collections....[D]iscrimination in the acceptance of gifts is the best policy.

Rare book libraries must have clear acquisitions policies—plans for adding to, funding, developing, specializing, and caring for a special collection. Archer stresses developing a plan to get more materials; Peckham says the library should have a clear list of priorities, and Powell even formulates the basic concerns: "What to Get, How to Get It." As early as 1938 Huntington wrote a thesis on administrative practices and how to formulate them for rare books. And Harlow says that one basic plan is to get good people to administer the collection and publicize it; his idea is, to get more, have more. The best collections attract books.

An acquisition policy should provide for opportunities and funds for dealing with private collectors and dealers, who may have a wealth of information useful to the librarian, and who can supply the library with valuable items—the dealer through sales, the collector through bequests and gifts. Wright points out that many a collector has helped an institution develop its collection. Beyond collections and dealers are library friends groups, wealthy local (or nonlocal) businesses, and private and public groups, who might be able to generate support for the library. Grendler writes about the importance of "grantsmanship" to rare book collections. Her essay on the "responsibility for the solicitation of outside support" is an excellent guide to the problem of financial support for rare book rooms. The general consensus was that any source of income—through academic, federal, state, or local government, or philanthropic groups, public or private—was worth pursuing to finance or add to the holdings of the rare book library.

A few other areas of rare book librarianship worth mentioning in passing as of concern to librarians are the decision of what areas to concentrate on in collecting, the status and duties of rare book librarians, "legal aspects of librarian-book collector relations" and "Restoring Tax Incentives for Manuscript Donations," and dealing with alumni.
Though many of the areas of rare book librarianship that I have discussed here are relevant in general to other areas of library management (cataloging, acquisition, preservation and handling, use, etc.), each of these areas requires special consideration from a rare-book perspective. The expansion and increased specialization of the profession only serve to point up the axiom, the more we know, the more we need to know.

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1. For example, the American Library Association’s Rare Book and Manuscripts Section (RBMS) has been in existence only about thirty years; in 1955 it was formed as a committee and in 1958 it became a section. See Ashby, Anna Lou. “RBMS: An Overview.” Rare Books & Manuscripts Librarianship 1(April 1986):7-9.

2. For convenience, I use the word book generically to mean all the holdings that rare book librarians deal with, including nonbook materials.


4. Clearly there is a theoretical approach to any practical issue—e.g., the theory of acquisitions as opposed to the actual acquisition.

5. A scholar using rare books may want to know the kind of paper a book is printed on (watermarked or not; sized or waterleaf; wove, laid, or antique laid), the publisher, textual or typographical variants, peculiarities in typography, printers’ devices, binding structures, tail pieces, catchwords, dingbats, or running heads. Generally information on these is not available in most catalogs; however, the RBMS Standards Committee is helping to make this information more readily accessible through their published thesauri.


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15. Ibid., p. 130.
16. Ibid., pp. 131-32.


34. Ibid.


37. Cave, *Rare Book Librarianship*, chap. 11.

38. Peckham, Howard H. "Acquisition of Rare Materials." In *Rare Book Collections*, pp. 30-31.

39. Ibid.

40. One excellent article on computerization in rare book facilities is that by Kimball, Margaret J. "Workflow for Processing Manuscripts in Automated Systems." *Rare Books & Manuscripts Librarianship* 1(Fall 1986):117-26; and Joan M. Friedman's column "The Antiquarian Micro," which appeared in the first issue of *Rare Books & Manuscripts Librarianship*, (pp. 11-15) promises to be a valuable source of information.


42. Friedman, "Rare Books," pp. 153-55.

43. See for example Alden, John E. "Organization and Service." In *Rare Books in the University Library*, pp. 12-18. Archer, *Rare Book Collections*; Baughman, who stresses accessibility and utility in the organization of the collection; and Cave, *Rare Book Librarianship*, chaps. 8, 9.


48. Ibid.

49. Peckham, "Acquisition of Rare Materials," p. 32.


53. Ibid., p. 439.


55. Peckham, "Acquisition of Rare Materials," p. 28.

56. Powell, "Functions of Rare Books"; and "Policy and Administration."


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65. Friedman, "Rare Books and Manuscripts Section."

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Objectifying the Book: The Impact of Science on Books and Manuscripts

JEFFREY ABT

Introduction

The April 1957 issue of Library Trends devoted to rare books contains no suggestion of the extraordinary impact science would have on the study and care of books in the years to follow.1 Certainly this was not because significant efforts had not already taken place. Perhaps the authors underestimated the accomplishments and potential of science for this field. After all, not until six months after the issue’s publication would Sputnik be orbited bringing in its wake a sudden wave of science-related publicity to the general population, heralding a period of great public interest in the sciences. Nine years later, the Arno river would sweep over Florence leaving the chief cultural treasures of the city near total ruin. The subsequent international rescue effort focused the attention of a public, by then attuned to science’s potential, on both the enormity of the disaster and on the application of science to the preservation of cultural artifacts, including books. For some, as with the Sputnik launching, this sudden revelation of the benefits of science for material culture implied that these strides resulted from the event rather than from decades of patient experimentation. Of course such was not the case. Like flashbulbs in a darkened room, both events served to throw in sharp relief developments that had long been underway. While

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Sputnik and the Arno may have had some effects on scientific research, these influenced the intensity of such efforts far more than their direction.²

It is the purpose of this essay to outline the history of scientific investigations into the makeup and care of rare books and manuscripts.³ The narrative is divided into three parts. It begins with the first stirrings in the eighteenth century and follows these down to the eve of World War II when systematic studies rapidly proliferated and were first integrated into the specific needs and questions posed by libraries with historical collections. Next is an overview of the increasingly quickened pace and deepening specialization of researches which have characterized the period from the eve of World War II to the present. This essay is then concluded by a summary of some of the less apparent effects of these developments with an eye toward how these have reshaped contemporary conceptions of the physical book.

This is a wide net to cast and the lines have been trimmed to narrow the discussion. First, science is taken in its more limited sense to refer to the systematic collection of information through physical analysis and experimentation.⁴ Second, only those developments which reflect a direct engagement with books and manuscripts as physical objects (as opposed to their textual or iconographical content) have been included. Thus, for example, there will be no discussion of the computer’s arrival in rare book repositories,⁵ nor will any consideration be given to such other interesting and relatively long-lived efforts as those to secure or reformat books.⁶ Last, restricted space has meant that the history of leather- and parchment-related developments and those connected with the effects and control of vermin will not be covered.⁷

Finally, a word on the title which underscores an underlying current of this essay. Whether for the purposes of interpretation or preservation, science has been both forming and revealing the basis for a clearer understanding of the book as a physical object. By opening a window into the opportunities science allows for preserving and probing the evidence imbedded in books, perhaps this essay can contribute to their more rigorous preservation as cultural artifacts and to widening investigations into the many layers of information they have yet to yield.

Beginnings

The earliest experimenters to apply scientific tools and methods to library materials were generally isolated from one another historically and geographically. One result of this separation was a loss of many important discoveries followed by subsequent efforts, years later, which
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would cover much the same ground. It was not until quickly proliferating researches internationally were linked by industrial applications and a growing public interest at the end of the nineteenth century, that the many developments in this area began to cohere into a distinct body of knowledge. Almost from the beginning two courses of inquiry could be distinguished: one centered on the durability of books and manuscripts stimulated initially by concerns over damaging storage conditions and the faulty manufacture of the materials of which library materials are composed; the other line of study applied increasingly refined techniques and instruments of the physical and natural sciences to the investigation of books and manuscripts, though almost exclusively for forensic purposes. Neither of these two avenues of study had an immediate or direct impact on the care or investigation of library materials in their day. Nonetheless, they provided the foundation upon which today's highly sophisticated approaches are built.

Englishman William Lewis (1708-1781), like many in his time, sought ways by which the practical necessities of life could be improved. Among the several concerns he addressed in his Commercium Philosophico-Technicum (1763) was the tendency of contemporary writing inks to fade. Not content to merely create new ink formulas and apply these in practice, Lewis attempted to assure that his recipes be able to withstand the test of time. He correctly observed the effects of sunlight in accelerating aging and applied this phenomenon in a series of experiments. For these he prepared swatches of paper inscribed with different ink formulas and then exposed them to sunlight. After several months of exposure he carefully evaluated the results. Though not wholly conclusive, this investigation led to a related observation that faded writings in some manuscripts could be strengthened by brushing the leaves "with an infusion of galls." It is not certain that Lewis was the first or even the only figure to note this reaction. Nonetheless, the practice of applying gall washes to manuscripts gained some acceptance in the eighteenth century, sometimes with near-disastrous consequences. However, it was only after the beginning of the nineteenth century that experimental studies of library materials, especially paper, began to be subjected to more precise and verifiable tests. Among the earliest such analyses was one conducted by the prominent English physicist and chemist, Michael Faraday (1791-1867), while he was still a young and relatively unknown laboratory assistant in London's Royal Institution. At the behest of fellow Englishman and early experimenter in color relief printing, William Savage (1770-1843), Faraday analyzed a number of Savage's favorite printing papers—all foreign made—to gain insight into the reasons for their especially desirable qualities in order to prod
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English papermakers into duplicating these. The test results, published as an appendix to Savage’s *Practical Hints on Decorative Printing* (1822), were numerous and precise but revealed little useful information about the papers as Faraday himself remarked. 11

It was during this period that concern began to be voiced over the declining quality of printing papers. Perhaps the earliest and undoubtedly the most acute critic of early nineteenth-century papers was English experimenter John Murray (1786-1851). In a letter to *The Gentleman’s Magazine* published in the July 1823 issue, Murray called attention to “the present state of that wretched compound called Paper,” citing as an example his 1816 Bible which Murray described as “crumbling, literally, into dust.” He concluded his missive with the results of a series of tests on paper from his Bible, extraordinary in their accuracy:

To the tongue it presents a highly astringent and aluminous taste.
On a heated metallic disc the leaf evolves a volatile acid, evincing white vapours with ammonia.
The paper is brittle as tinder, and of a yellowish tint. The ink is brown.
Liturus paper was reddened in a solution of the leaves in distilled water.
Hydriodate of potassa became greenish yellow, from free sulphuric acid, or rather from the excess of that acid, obtaining in the supersulphate of alumina (allum).
Osallate of ammonia gave the usual indications of lime.
Nitrate of silver exhibited the presence of muriatic acid, no doubt resulting from the chlorine employed in whitening the rags or paper.
Nitrate of baryta proved the presence of sulphuric acid, or of a sulphate. 12

Murray expanded on these findings in subsequent publications, 13 but the range and accuracy of his 1823 tests would not be improved upon for more than sixty years.

The problems of which Murray complained had their origins in the almost frantic search by late eighteenth- and early nineteenth-century papermakers for larger and less expensive sources of raw materials to supply a growing popular appetite for printed matter. The by now familiar sequence of developments—including the introduction of alum-rosin size in 1807 and the expanding use of groundwood pulp in the 1840s followed by chemically rendered wood pulp shortly thereafter—led to a sharp decline in durability of nearly all printing and writing papers in subsequent years. 14 As more and more citizens such as John Murray began to decry the impermanence of contemporary papers, pressures mounted for the establishment of government standards of quality to assure the permanence of printed and written materials.
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The Germans led the response by founding an imperial testing station in Charlottenburg (now part of Berlin) about 1885. Though several German scientists had already been studying the subject before the testing station was established, the Charlottenburg program accelerated the scientific investigation and quantification of paper’s impermanence and means for correcting it. The outcome of the program’s studies in Germany was generally limited to the creation of paper manufacturing standards for government documents. Not until 1898 did the Germans’ pioneering efforts find a larger, international audience.

In response to growing public alarm in England over the deterioration of paper, the council of the Royal Society of Arts, founded in 1755 and devoted to the “Encouragement of Arts, Manufactures, and Commerce,” appointed in 1897 a “Committee to investigate the causes of the deterioration of paper.” Among its members was Charles Frederick Cross (1855-1935), an expert on the nature and uses of cellulose, the basic building block of all papers. It was almost certainly Cross who brought to the committee and to the society knowledge of the experiments underway in Germany, as evidenced in his own published work. The committee’s report, first published in the Journal of the Society of the Arts (1898) and later as a book with appendixes (including abstracts of eighty-seven studies which emanated from Charlottenburg between 1885 and 1896), was designed to both explain the causes for paper’s deterioration and to promote standards improving the quality of English-manufactured papers. The report marked an important turning point in the preservation of library materials for two reasons: first, the committee bridged the gap between an increasingly specialized area of scientific inquiry and the cultural institutions whose collections would benefit from such research; second, the committee accepted and transmitted a body of scientific evidence as a means of both verifying its position and advocating its cause. The committee’s lattermost role in consolidating, interpreting, and disseminating the work of the German scientists has remained its most influential accomplishment. Although little came of the committee’s goal to raise the quality of English papermaking, the wider audience it created for the German researchers appears to have prompted a wide proliferation of similarly motivated studies throughout Europe and America that would continue to the eve of World War II. The several hundred subsequent articles and monographs—though advancing investigatory methods and tools for enlarging knowledge of the causes of paper deterioration and proposing higher standards for paper manufacture and storage conditions—did not result in the discovery of effective paper restoration techniques for already deteriorated papers or in a cost-effective technology for a truly...
permanent and durable paper by today's standards. Only when William J. Barrow inaugurated his own research program in 1935 would significant advances for the betterment of paper restoration and paper manufacture begin to take place.22

Throughout this early period strides were also made into the scientific investigation of books and manuscripts to answer historical and cultural questions as well. The versatile German scientist, Julius Wiesner (1838-1916), applied his skills to the doubts surrounding the makeup and origin of materials in the "Papyrus Erzherzog Rainer" in the Oesterreichische Museum, Vienna in 1887, for example. Using microscopy and chemical analytics, Wiesner demonstrated that the fragments were actually early wove or laid papers, perhaps dating from the eighth or ninth centuries and thus among the earliest examples of papermaking in the West.23 Such studies motivated by historical or cultural concerns were highly infrequent, however. This is not to claim that scientific investigations into library materials, especially manuscripts, were not underway. Toward the end of the nineteenth century, the evidence produced by these studies began to gain acceptance in American and English courts of law for adjudications hinging on questioned documents. A very active and highly-skilled community of professionals soon formed around the problems of analyzing questioned documents and presenting the results in ways acceptable in legal forums. A pioneer in this field was American Persifor Frazer (1844-1909) who first began publishing his techniques in the 1880s.24 Frazer's most influential work, both among his peers and others, was A Manual of the Study of Documents (1894).25 Beginning by coining the term "bibliotics" to describe his specialty, Frazer proceeded to explain it as:

The study of all the materials used in making designs for the transmission of intelligence, as well as the individual character exhibited in the designs themselves; and though it is distinct from art conceptions, from literary or historical criticism of the intelligence conveyed, and from accurate chemical investigation into the nature of bodies, yet it accepts and needs the aid of all three of these studies in obtaining its results.26

Frazer followed with chapters on "Magnifying Instruments," "Colored Prisms" (for colorimetric analysis), "Quantitative Methods," and "Chemical Examination" to cite just a few. In 1901 Frazer revised and republished his work under the title Bibliotics or the Study of Documents deemphasizing a mastery of the "intricacies connected with getting conclusions in legal form before the courts" in order to give greater attention to "the means of applying scientific principles to the investigation of practical problems concerning documents."27 Frazer's approach was adopted by several others including Albert S. Osborn
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(1858-1946), who brought a number of innovations to the photography and visual examination of documents including the use of ultraviolet light and Charles Ainsworth Mitchell (1867-?) who urged the use of techniques developed by the paper industry for microscopy and chemical analysis.

Although the forensic scientists laid the groundwork for scientific investigations into manuscripts and books and the effective documentation of their findings, general knowledge of this work remained confined to legal circles. The first to synthesize this body of research and, along with studies in other fields, apply it to historical questions raised by library materials was Reginald B. Haselden (1881-?), then curator of manuscripts at the Huntington Library. In the preface to his seminal Scientific Aids for the Study of Manuscripts (1935) Haselden remarks:

In recent years scientific knowledge has extended its sphere of usefulness to almost all fields of endeavor. The question is whether this knowledge can be utilized and brought to bear on the complex problems encountered by the paleographer and the student of literary and historical manuscripts....

The purpose of this book is to prove the value of scientific instruments in the solution of some of these problems, and to demonstrate the necessity of a scientific examination of the script as well as of the physical structure of the manuscript....

Scientific instruments are helpful in three ways in the examination of manuscripts: first, in the solution of problems of interpretation relating to the text, physical history, and provenance; second, in the detection of forgery; and third, in the diagnosis of injuries and diseases.

For the technical sections of his book which include chapters on "Light and Colour," "Illuminants and Light Filters," "Microscopes and Magnifiers," "The Ultra-violet Lamp and Fluorescence," "Photography" (including infrared and "Röntgen-ray"), and "Measuring Instruments and Handwriting," Haselden draws heavily on the work of forensic scientists as well as that of specialists in the paper, ink, and photography industries. Haselden's highly systematic approach to the subject along with his nearly comprehensive and carefully cited bibliographies make Scientific Aids a major benchmark. However, Haselden limited his study to the first two of his categories of applications, scarcely touching on the "diagnosis of injuries and diseases."

Englishman Julius Grant (1901-?) agreed with Haselden's views but enlarged the latter's scope to include the problems of preventive care and restoration as well. Accordingly, Grant's Books & Documents: Dating, Permanence and Preservation (1937) is divided into two parts: the first, devoted to "The Dating of Books and Documents," includes chapters on "Dating Evidence from Paper," "Dating Evidence from Ink
and Other Sources,” and “Experimental Dating Tools”; the second part, focuses on “The Permanence and Preservation of Books and Documents” with chapters on “Paper Making [and ‘Ink Manufacture’] from the Point of View of Permanence,” “Tests for the Permanence of Paper and Ink,” “The Influence of Light, Heat and Air on Permanence,” “The Selection and Specification of Permanent Papers and Inks,” and “Permanent Records: Methods of the Future” (including a section on microreformatting). While Grant’s book is not as thorough or, in some technical areas, as accurate as Haselden’s, the breadth and integrative nature of its conception makes *Books & Documents* an equally important work. Grant’s departure from Haselden’s approach was no accident, for, as he noted in his preface:

> It is the author’s hope that this work will have a threefold appeal—at least. Firstly, he trusts that it will prove helpful and interesting to librarians, collectors and antiquaries, and in fact to all those members of the general public who are sufficiently fond of books and documents to want to know something of their age, history and origin of the materials which comprise them, the extent to which these materials are likely to resist the ravages of time, and the best ways of assisting them to do so. Secondly, the book is addressed to scientific workers, amateur or professional, whether engaged in academic or industrial pursuits, whose work involves a study of these same matters as scientific problems; and thirdly to all those concerned with the manufacture and production of books or documents, namely paper-makers, ink-manufacturers, printers, binders, publishers and of course authors.

> The writer feels that to provide something for every member of such a varied public is no mean task. If, however, he has succeeded in doing so... he will feel that the existence of this book has been justified because, so far as he is aware, no other work has yet appeared which has attempted to correlate these varied interests.33

By conceiving of a unified and mutually beneficial relationship between scientific studies of books for their care and those designed to answer historical questions, Grant heralded the arrival of the library-based laboratory where this approach to the physical book would be realized.

**To the Present**

The dimensions of William James Barrow’s (1907-1967) contributions to the physical study and care of books and manuscripts have yet to be fully and accurately assessed.34 First trained as a bookbinder, Barrow came to specialize in document restoration, establishing his own shop in 1932. He soon observed the relatively short life of conventional
manuscript restoration techniques which included silking with a variety of materials as well as his preferred technique: cellulose acetate lamination. Barrow brought many improvements to the materials and presses necessary to this process, but quickly realized that the problem of deteriorating papers and their repair—especially for the modern variety—required deeper investigation. By 1935 he had launched a personally-financed research program into the causes of deteriorating paper, and by 1955 was prepared to publish his findings from a broad range of studies in *Manuscripts and Documents: Their Preservation and Restoration.* Within its covers one can find literature reviews on the deterioration and restoration of writing and printing inks and papers, the effects of improper storage conditions, and most importantly, the results of Barrow’s pioneering investigations into the chemical “deacidification” or more properly, alkalinization of papers for their preservation. The value of Barrow’s efforts was broadly recognized, soon leading to a series of grants from the newly-formed Council on Library Resources, including a 1961 award to establish a library materials research and testing laboratory in space provided by the Virginia State Historical Society. The breadth and character of Barrow’s Council-sponsored researches were remarkable and the resulting publications continue to remain key references. However, the significance of Barrow’s accomplishments lie not with the particular innovations and discoveries which arose from his more than thirty years of experimentation but with the nature and rigor of his inquiries. Barrow transcended the symptoms of the problem to reverse their source. Furthermore, most of his research was conducted in the context of facilities designed specifically to investigate the materials with which he was concerned. Under his careful direction, the study and repair of library materials passed from reading room tables and bookbinders’ benches to the counters of modern science laboratories with their attendant panoply of specialized methodologies and instrumentation.

Barrow’s self-financed research lab of 1935 was followed by the creation of similar, though institution-based, facilities throughout Europe and North America. One of the earliest was Italy’s Istituto di Patologia del Libro in 1938. This was followed by the founding of a succession of library materials conservation and research centers in Poland (1949), the Soviet Union (1950), Bulgaria (1956), France (1963), Spain (1969), and the United States (1970). Indicative of the growing number of scholars and conservation scientists active in these facilities and elsewhere, was the appearance of increasing numbers of articles devoted to books and manuscripts in such journals as *Studies in Conservation* (first published in 1952), *Art and Archaeology Technical...*
Abstracts (which began publication in 1955), the Journal of the American Institute for Conservation (which began publication in 1960 as the Bulletin of the American Group of the International Institute for Conservation), and in 1969 Restaurator, International Journal for the Preservation of Library and Archival Material commenced publication. The frequency of specialized compilations began to grow during this period as well. Here studies on library materials appear as sections in larger books such as “Works of Art on Paper and Parchment” in Conservation and Restoration of Pictorial Art (1976), or as the sections on paper-related materials in the Advances in Chemistry Series Preservation of Paper and Textiles of Historic and Artistic Value (volumes 1 and 2, 1977, 1981), until, more recently, whole collections devoted to the field appear as with Conservation of Library and Archive Materials and the Graphic Arts (1985). Specialized bibliographies also begin appearing, including Louise Louden’s Paper Conservation and Restoration (1978) and the Cunhas’s Library and Archives Conservation: 1980s and Beyond (1983). If one had to single out a handful of noteworthy research projects, certain efforts come immediately to mind including Reed’s Ancient Skins, Parchments and Leathers (1972) in which he utilizes chromatography and electron microscopy studies to illustrate his points; Roosen-Runge’s Farbgebung und Technik Fruhmittelalterlicher Buchmalerei (1967) which, through a variety of sophisticated chemical analytics, documents a number of key pigments commonly employed by medieval illuminators; Petushkova and Nikolaev’s “Nuclear Magnetic Resonance Study of Parchment and Leather” (1983); the cyclotron-based proton milliprobe studies of the Gutenberg Bible by Schwab, et alia (1983-1986); and Humphrey’s experiments with parylene conformal technology for preserving embrittled and otherwise unsalvageable books and manuscripts (1984-1986).

The specialization of these researches and the publications which transmit them, coupled with their proliferation, readily daunt efforts to explain their direction or import. As this mass of data has grown and become increasingly dense it has also tended to obscure the great strides which have been taken in the care and historical investigation of books, particularly in the past half century. The tools necessary to explain and solve virtually all the conservation problems which can arise with library materials now exist. So too are the means for answering many scholarly questions where the clues lie buried in the object’s physical composition. Indeed, a point has been reached where science has exceeded the ability of institutions or individuals to utilize it. Either the cost or the complexity of the technology to solve a particular problem is frequently perceived as overshadowing the value of the object in question, whether determined on a monetary or intellectual basis. For the
curator confronted with day-to-day administrative responsibilities for
thousands or millions of books and manuscripts, the existence of this
body of knowledge and the facilities where it is being created or utilized
in seemingly exotic investigations or restorations, appear as remote and
perhaps inapplicable to the collection just down the hall. One could
argue, returning to the 1957 issue of Library Trends, that even if the
editor had considered covering the noteworthy developments in science
and the physical book just then occurring, the article would have been
out of place for a professional readership distracted by more immediate
concerns. There may be some truth in this position though many would
counter that a responsible custodian could find much information here
directly applicable to the daily management of a rare book and manu-
script collection. Nonetheless, and more to the point, an effect of the
expanding number and frequency of researches over the past one
hundred years has been a slow but inexorable shift in scholarly and
curatorial perceptions of the book’s infirmities and historical research
potential.

Objectifying the Book

Scientific investigation in this century has based itself on the prin-
ciple that a discovered or hypothesized truth can only be confirmed by
methods and techniques which as much as possible are purely objective.
Though a subjective observation may spark a thesis, the thesis can only
be proved by means which do not include subjective observations as a
trustworthy way of gathering evidence. The book’s arrival in this arena
of inquiry has implicitly necessitated an acceptance of certain limita-
tions on the knowledge one can assume with regard to both the conser-
vation and historical meaning of the physical book. For example, it is
commonly known that while a book may appear as durable and more-
or-less permanent, its chemical composition could limit its useful life to
sixty or eighty years at most. The book’s longevity cannot be accurately
determined without a pH meter and other means of chemical analysis.
Likewise one may suspect, based on a stylistic analysis, that two differ-
ent illuminators contributed to the cycle of miniatures in a manuscript.
Positive proof can only be achieved through a combination of micros-
copy and chemical comparisons of the pigments and paint application
techniques.

These examples do not represent a complete suspension of judg-
ment in one’s approach to the materials in question. Rather they show
how initial observations have become temporary stepping off points
toward verification by other means, where once such observations
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would have been more likely to gain acceptance as conclusive in themselves. No longer are Berensonian-like pronouncements received as the last word in questions of a book’s makeup. The authority of such statements is being displaced by a certain hesitancy born out of an awareness that imbedded within the book’s structure lies information which, through science, can be revealed with much greater precision and reliability. Science has invaded the realm of curatorial judgment-making and connoisseurship.

The book has also been shown to be a very complex physical object. Its meaning has been enlarged by science which transcends the designs of bindings and illustrations and the patterns of knowledge expressed through texts to uncover much new information. Not surprisingly, science has drawn growing numbers of conservators and scholars alike to the portals it offers into the book. From these very specialized vantage points have emerged a host of techniques for providing better care for the book as well as fresh insights into many unanswered questions about its creation and transmission. However, the key to this opening into the physical book is an acceptance of the book as an object more completely understood through science, while at the same time accepting the objectivity of science as an appropriate method for posing and answering questions about the book. One must on occasion be willing to adopt the tools and techniques of science, necessitating both a different approach and different expectations. In other words, one must objectify the book to see it whole.

References


3. One could write at great length about what is meant by “rare book.” Because the historical scope of this essay transcends the institutional sequestering and thereby de facto definition of the rare book, all scientific studies of printed codex-format materials have
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been considered germane as well as those focusing on any manuscript forms whether in
codex or more modern loose-leaf formats. Although not infrequently found in rare book
collections, works of art on paper and photographic media have been deliberately
excluded the restrict the length of this article.

4. Settling on a definition of science is no easy matter, particularly when the subject
is viewed from the perspective of an institution such as the author's where the boundaries
of disciplines are constantly brought into question and the conceptual foundations of
science are themselves the subject of a degree-granting program. Nonetheless, a point
of reference has been necessary and that provided by the Oxford English Dictionary has
been a useful guidepost throughout: "A branch of study which is concerned with a connected
body of demonstrated truths or with observed facts systematically classified and more or
less colligated by being brought under general laws, and which includes trustworthy
methods for discovery of new truths within its own domain. [And] often treated as
synonymous with 'Natural and Physical Science,' and thus restricted to those branches of
study that relate to the phenomena of the material universe and their laws..." The
1971, p. 2668.

5. The use of the computer in library environments remains generally limited to
automated management of acquisition, cataloging, and circulation information which
libraries possessed and administered before computers—albeit more slowly. The arrival of
the computer has yet to change the nature of our knowledge about the book; it has only
mechanized what we already knew. However, the applicability of the computer to the
questions posed by the physical book may turn out to be, by definition, limited to the
collection and analysis of data created through other means.

6. The author is aware that book and manuscript security is coming to be increas-
ingly viewed as a function of library preservation administration. This organizational
placement is based on an argument which characterizes security as a preventive aspect of
an institution's efforts to maintain the physical integrity of its collections. While this
position has its merits, it does not alter the fact that the tools and methods of library
security are not directly applicable to the study or treatment of books and manuscripts.
Attempts toward creating photography-based facsimiles and micrographic reproduc-
tions of library materials can be traced to the dawn of photography itself in the mid-
nineteenth century. For a concise, nearly exhaustively footnoted survey of the subject from
Dancer's 1839 daguerrotype microcopy of a document to the 1950s development of
xerography for the Atomic Energy Commission, see: Ballou, Hubbard W. "Photography

7. There is a lamentable absence of leather conservation literature surveys, particu-
larly with regard to the use of leather for bookbinding. For a very general and only
partially applicable overview see: Stambolov, T. Manufacture, Deterioration and Preser-
vation of Leather: A Literature Survey of Theoretical Aspects and Ancient Techniques.
Amsterdam: Central Research Laboratory for Objects of Art and Science, 1969.
For a selective and accurate bibliography of the literature on library vermin and their
control through the mid 1930s see: Weiss, Harry B., and Carruthers, Ralph H. Insect
subsequent studies will be given below.

8. Lewis, W. Commercium Philosophico-Technicum. London: For the Author,
1763, pp. 378ff.
10. Instances of damage caused by gall washes and varnishes, colorless when first
applied but which later turn dark yellow or brown, are not uncommon. For a recent
 testimony on the subject, see the "Editor's Note" for the facsimile: Great Domesday.
Hurst, Rees, et al., 1822, pp. 80-85. Faraday says (p. 82): "I have been thus precise in
describing the analyses, and the results afforded by them, rather to satisfy [Savage's]
earnestness, than from an opinion that they present any thing capable of improving the
art of paper making: and I should expect that matter much more interesting would arise
from an examination of the mechanical properties of the paper, and more applicable to the improvement of our own manufactory." It is unclear whether the particular tests employed by Faraday were specified by him or by Savage.

13. _________. Observations and Experiments on the Bad Composition of Modern Paper. London: G. and W.B. Whittaker, 1824; and _________. Practical Remarks on Modern Paper. Edinburgh: William Blackwood, 1829. In the former, Murray recommends that printers test their papers for quality (p. 12), urging litmus (p. 17), and other tests (pp. 18-19) to achieve reliable results. In the latter, Murray's explanation of the deteriorative effects of alum which he accurately analyzed as bisulfate of alumina and thus an acid (pp. 81-82) and those of chlorine bleaches (pp. 82-83) were far ahead of his time.

14. There are a number of surveys on this subject ranging from the superficial to the excessively technical. One which strikes a fair balance is: Clapp, Verner U. "The Story of Permanent/Durable Bookpaper, 1115-1970." Restaurator (Supplement no. 3, 1972).
16. One of the pioneers in Germany was Egbert von Hoyer (1836-1920). See for example: von Hoyer, Egbert. Le Papier, Etude sur la Composition, Analyses et Essais. Paris: Everling et Kaindler, 1884. An authorized French translation of Hoyer's book, it is printed seriatum on ten different types of paper with the beginning of each new sort labeled along the tail and fore-edges of the first recto with Hoyer's analytical categories, and the performance according to each, of the paper type in question. Hoyer's approach was based on physical characteristics and mechanical performance standards only. A comparison of the papers after one hundred years of natural aging with Hoyer's evaluations of their quality dramatizes the importance of understanding the chemical makeup of papers too if one is seeking to predict their permanence.
26. Ibid., p. vi.
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33. Ibid., p.v.

34. The factual yet essentially unrevealing encyclopedia article (reference 23) and piece by Clapp (reference 14) not withstanding.


Scientific Equipment for the Examination of Rare Books, Manuscripts, and Documents

PAUL S. KODA

Rare book librarianship has changed and improved a great deal since the publication of the 1957 issue of Library Trends on "Rare Book Libraries and Collections." The theme reflected a preoccupation with the concept of rare books and with the development of collections. During the ensuing years no one has provided an entirely satisfactory definition of rare books, but then it is not the issue it seems to have been in the middle of the 1950s. Collection development, on the other hand, has been refined and systematized during the past thirty years. Changes and improvements include: better education for rare book librarians; a clearer understanding of how rare book collections can serve a multiplicity of humanistic disciplines, an understanding that continues to undergo rapid development; the establishment of rare book standards in ethics, cataloging, and security; contributions by rare book librarians to computer automation that have provided comprehensive bibliographic control of collections; and the development of ancillary skills such as the conservation of library materials and fund raising.

During this thirty-year period the importance of rare books for scholarly research has increased. Most recently, for example, rare books have been the focus and foundation for the burgeoning area of research called the history of the book. Books have become both the substance and subject of research for scholars taking an historical approach in traditional disciplines like art, sociology, and anthropology as well as in numerous areas of history itself. At the same time, rare book librarians have continued to assist their traditional readers in textual studies.

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and bibliography, whose emphasis has always been on the interrelationship between the physical work and the verbal text it carries. If, indeed, there has been a lesson to be drawn from their work with the physical book, it is the recognition of the primacy of the physical text. Original documents can be returned to again and again—as the scientist repeatedly returns to the natural world—to obtain significant new information as new historical methodologies are developed and as more refined analytical techniques are applied.

These new methods and techniques in no way reduce the importance of traditional approaches to the study of original documents. A case in point is the scientific analysis that was made of the Plate of Brass that was purportedly fashioned and deposited in California by Sir Francis Drake in 1579. Early scientific tests on the plate were inconclusive, yet nearly every scholar trained in Elizabethan philology would immediately question the plate’s authenticity. The point is that traditional disciplines like philology, textual studies, and history continue to offer time-tested approaches to the study of rare documents and should always be used in conjunction with new methods of scientific investigation.

There are, on the other hand, several advantages in using the new analytical approaches for studying rare documents. Perhaps the main benefit is the concentrated focus on the documents themselves—complete examinations or reexaminations with scientific impartiality can reveal new information about their contents and can stimulate fresh dialogue about their manufacture and place in history. Another benefit is the development and application of new techniques for determining the authenticity of documents. They also help conservators provide better care for documents. Finally, the new techniques refine ways of answering traditional questions about variants regarding editions, printing impressions, bindings, and paper manufacturing.

Many of the new techniques and instruments for examining rare documents are not well known outside the immediate environs of rare book libraries. It is the aim of this paper to provide an introduction to some of these instruments and to describe how they provide a better understanding of rare documents.

EQUIPMENT

The First Group

The equipment required for the physical examination of books and documents falls into four groups. The first group includes large and
expensive pieces of equipment. The largest and most expensive is the atomic particle accelerator (see R.N. Schwab's article in this issue for an extended discussion of its operation and usefulness for research). Accelerators operate with a combination of funds and staffing from major universities and the government, and they are only available for research in a few areas of the United States. Using an accelerator requires teams of researchers, including librarians, physicists, bibliographers, and technicians. The financial cost for performing such analyses is very high, as one can imagine, so it is understandable that the documents which have been studied are of paramount importance to Western history and culture: they include works like the Gutenberg Bible and the Bay Psalm Book.

The Second Group

The equipment in the second group is much less expensive and much more likely to be found on every university campus and in many industrial research centers. The single most important instrument in this category is the electron microscope (EM). The technical ideas for electron microscopy were first promulgated in the 1870s, but it was not until the 1930s that they were practically put to use. The success of electron microscopy is based on the fact that the wavelength of conventional light is approximately 500 nanometers (nm) and that the standard optical microscope is incapable of separating details finer than 250 nm. Instead of using a beam of conventional light, therefore, an EM uses the extremely short wavelengths of an accelerated electronic beam to form images in which fine detail is resolved, resolutions as fine as .2 nm.

Electron microscopes are traditionally classified as either transmission or scanning instruments. In transmission electron microscopes (TEM) a beam of electrons passes through the specimen being examined. In a scanning electron microscope (SEM), which is the preferred instrument for examining documents, the beam of electrons passes uniformly and systematically over the surface of the specimen. The illuminated points are "collected" electronically and formed into images that are projected on high-resolution television or computer monitors. Because the angular aperture of the SEM's probe-forming lenses can be very small, a large depth of field similar to conventional photographic cameras is possible. The resulting images are clear and astonishingly three-dimensional and of considerable diagnostic use. In order to perform an analysis, a small specimen has to be extracted from the document. During specimen preparation (either
micro-paring for a TEM or metallic coating for a SEM), the specimen is effectively destroyed. This, of course, is a major drawback regarding precious or unique documents. Though a typical sample specimen has a diameter of only 3 mm, its loss to a document may well be unacceptable. In these cases electron microscopy is not a viable tool for the physical examination of documents.

On the other hand, there are some instances when taking a specimen from an important book or manuscript is justified. They include the one-time authentication of a suspect document (the recent discovery of what purports to be an original copy of A Freeman’s Oath is an example); the understanding of previous conservation measures taken with a document (the holograph copy of the Declaration of Independence comes to mind); and the anticipation of future conservation work on an important manuscript (the Book of Kells is a possible candidate).

The fact that a document is altered when analyzed by electron microscopy makes it imperative that careful planning is done so the chosen specimen will yield the greatest amount of useful information, while at the same time being a fragment whose removal has the least impact on the document. Such planning requires the assistance of librarians, conservators, researchers, and technicians.

The ethical quandary of whether or not to extract a specimen diminishes when several copies of a printed book are available for analysis and when the questions being asked are common to every extant copy of a book. The risk diminishes even more when breakers (or, perhaps, leaf books) are available for analysis. In this regard, librarians may want to hesitate before disposing of duplicate fragments or minute pieces that come free in the day-to-day handling of books and manuscripts. They can be used to build badly needed collections of standard specimens.

The greatest potential for electron microscopy is probably with nineteenth-century documents because the uniformity of their materials and manufacturing makes it impossible to discern the differences readily visible in handmade documents. In the analysis of paper, for example, a SEM can be extremely useful in measuring the minute pattern made by the weave of the wire used in producing machine-made paper, a task that is notoriously difficult even with optical microscopes. Even more important, the SEM provides a clear picture of the length, fibrillation and shearing of paper fibers that take place during the beating phase of manufacturing, thereby providing information about the specific batch of pulp from which the paper was formed. This information can be used in determining whether particular sheets of paper were
produced at the same time by one manufacturer. In addition, SEMs provide vivid pictures of fiber interlocking (or lack of it), calendering, kinds of fibers, interstitial loading, and surface coating—important for identifying and classifying paper and invaluable for proposing conservation treatments and predicting longevity. The SEM can easily isolate the different graphic processes used to illustrate books in the nineteenth century. Very little detailed microscopic investigation has been undertaken to identify and classify the myriad photographic processes that were developed in the nineteenth century; a systematic examination of these photographs to document the processes can be materially aided by using scanning electron microscopy.  

The Third Group  
The instruments in the third category are often found in rare book libraries or in special collection departments within larger libraries. By and large, these instruments are divided into five groups: first, optical microscopes; second, photographic equipment; third, mechanical/optical collators; fourth, equipment to record watermarks; and fifth, ultraviolet lamps.  

Optical Microscopes  
The variety of optical microscopes that have been introduced since they were first employed in the seventeenth century are legion, and many of them help librarians examine the books and manuscripts in their collections. Yet no library has the resources to acquire more than one or perhaps two of these instruments. However, it is possible to acquire one instrument that meets most of the research needs of scholars. The characteristics of the ideal microscope include the following six features. The first is stereoptical viewing so both eyes can be used for looking at specimens. The eyepieces should be protected by rubber or Teflon cups which protect and allow researchers to wear eyeglasses; the eyepieces should also adjust to account for extremes in sight variation. Second, the microscope should be attached to an adjustable, extendible arm so large documents such as atlases and prints can be examined easily. Viewing oversized specimens can be improved with large, maneuverable staging platforms. Third, microscopes should have zoom lenses so a wide range of magnification is possible. They should also have a mechanical or electronic gage that accurately records every level of magnification for permanent records or photographs. Magnification from 2X to 580X is appropriate. Fourth, specimen illumination should
include reflected and transmitted light, though the former is used more frequently with documents. Light should be even, high intensity, and continuously variable. For day-to-day use, internal illumination is adequate (which can be modified with selective filters), but a source of light on an adjustable mount that is not connected with the microscope is very useful in providing different kinds of raking light. Ring illumination is also helpful when a large specimen is under view. Fifth, an attachment for microphotography is necessary if photographic records are required. Sixth, eyepiece micrometer discs or reticles (in either English or metric calibrations) facilitate the micromeasuring of fibers, web and wire marks, and type strokes.

**Photographic Cameras**

Many different kinds of cameras have been invented since they first appeared in the nineteenth century and many of them can be used to investigate documents. The photographic requirements for such investigations usually fall into the following categories: first, the ability to provide close-up photographs; second, the possibility of attaching the camera to a microscope; and third, immediate results so photographs can be retaken if the originals do not capture the required evidence or if the specimen has to be repositioned.

One class of camera that meets most of these criteria is manufactured by Polaroid. Everyone is familiar with the ability of Polaroid cameras to take photographs that develop in a matter of seconds, but it is not generally known that Polaroid has developed cameras that are used for medical close-up photography and forensic analysis. They are easily adapted to the needs of the librarian or bibliographer. The best and most versatile Polaroid system is the CU-5 Close Up Camera. It is a light, portable model that can be taken into the field by researchers who travel from collection to collection. More important, however, is that the camera is easy to manipulate so hard-to-take pictures of details like binding structures are captured quickly and efficiently even by those not well-versed in photography. The photographic records can be the same (1:1), magnified (2:1, 3:1, 4.5:1, and 10:1), or reduced (1/2:1, 1/3:1, and 1/4:1). Both black and white (with a reusable negative) and color film can be used. By attaching a hood the CU-5 can also make hard copy records of SEM displays.

**Watermark Reproduction**

Almost from the very beginning of paper manufacturing, papermakers have formed sheets of paper that contain watermarks and countermarks, which are designs, patterns, dates, and names that are visible
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when a sheet of manuscript or book paper is held up to the light. These marks are useful for dating books that do not have manuscript or printed dates, in determining the sequence in which the sheets of a book have been printed (vital to librarians helping textual scholars establish a text), in identifying first impressions or first editions of a book, and in verifying a document's authenticity.

Until the middle of the 1960s, the customary ways of recording watermarks were either by tracing or by translating measurements into line drawings. Both methods are cumbersome, hard on the eyes, and frequently imprecise. For several years more reliable methods of recording watermarks have been available. The first is called beta-radiography; it is a process that uses beta rays. A radiographic plate is placed behind or beneath the sheet of paper to be examined. The paper is exposed to the plate for several minutes. Because the paper is thinner in the place where the watermark has been formed in the sheet and because various thicknesses of paper block different levels of beta radiation, images of the watermarks can be recorded.

Beta-radiography does have a few disadvantages. The beta plate and film are expensive; approval to acquire and use a plate is time consuming because clearance has to be obtained from the Nuclear Regulatory Commission; special security and operational procedures have to be set up to ensure safety, though its danger to people is virtually nonexistent; and the time required to record a watermark can be lengthy, which reduces research productivity, a not inconsiderable problem for visiting scholars under severe time constraints.

The great advantage in using beta-radiography to record watermarks is that the writing or printing on the surface of the paper is too thin to affect materially the recording of the watermark. The resulting images are unobstructed and sharp. Another advantage is that the recorded image is a precise duplication of the watermark, making it possible to measure the watermark accurately and to publish it so that scholars can take advantage of the research. (See Woodward's article in this Library Trends issue for another discussion of beta-radiography.)

A more recent method of recording watermarks is the DYLUX process. It works by passing visible and ultraviolet light through a sheet of paper to DYLUX photosensitive paper. Primarily designed for obtaining virtually instant image proofs of line, text, and halftone negatives, the process effectively records watermarks, countermarks, wire lines, chainlines, and the weave in machine-made paper. Because paper is thinner at the location of a watermark, a sheet of paper acts as a quasi-negative by allowing differing amounts of light to shine through it. The process is simple and is done rapidly in two steps. The water-
marked paper is placed in a lightbox and covered with a sheet of DYLUX paper. Both are then exposed to visible light which records an image of the watermark on the DYLUX paper. The watermarked paper is removed and the DYLUX paper exposed again, this time to ultraviolet light to raise and fix the image, making it a permanent record visible to the naked eye.

Unlike beta-radiography, the rays of visible light used in the DYLUX process can be blocked at times by the manuscript or printing ink; the result is an image that is blurred or partially obscured. This drawback is often overcome by several advantages in using DYLUX. Both the machine and the DYLUX paper are relatively inexpensive, mainly because a beta plate has to be replaced every two or three years. It is a dry process that does not require water or chemicals, and the equipment can be set up and operated in a space no larger than an ordinary office desk. Perhaps its greatest advantage is speed, for it usually takes only a couple of minutes to reproduce a watermark and is a procedure that can be mastered by an amateur in a brief amount of time.25

Mechanical/Optical Collators

Collating instruments are used to compare copies of printed books against a known text to find out whether they have been typographically reset, thereby revealing undiscovered editions or states of the text. During the past thirty years three mechanical/optical collators have been invented and used for examining texts. The first, and by far the best known and still employed, is called the Hinman Collator.26 It was invented and used by Charlton Hinman to collate numerous copies of William Shakespeare’s First Folio to discover where the text may have been changed during typesetting and printing. The results were much better than expected. Not only was Hinman able to make major advances in restoring the text of many of Shakespeare’s plays, he was also able to discover new and important information about the way English Renaissance compositors and printers worked. The result was his monumental work on the printing of Shakespeare’s First Folio which is a model of investigation and identification for librarians examining documents or assisting researchers in using library collections.27

The Hinman Collator works on a principle of oscillating light. Two copies of a document—which can be a printed book, engraved plate, score, or map—are placed on adjustable cradles and aligned so they overlap exactly when viewed through a binocular eyepiece. The oscillating light is turned on; each page is illuminated in turn and is
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visible through the eyepiece. Because the human eye retains a lighted image for an instant after it disappears, any variations of the overlapping text/graphic image will appear as a rapidly moving word, phrase, or detail that can be tagged and examined more carefully when time allows. The collator is used to examine lengthy texts or a single broadside; it is used to uncover changes in graphic images or to discover reset pages or substitute leaves.

A more recent invention for collating documents is the Lindstrand Comparator, created by Gordon Lindstrand. It has the same function as a Hinman Collator but works on principles of stereoptics. A slight variation in spelling, punctuation, or design is immediately visible through a three-dimensional distortion or disorientation to the eye. Its advantages over the Hinman Collator are that it is easier to use, does not require an electrical source of power, is much smaller, and has better success when collating a photocopy of a book with an original printed version. The major disadvantage is that the operator requires good eyesight or eyesight that has been corrected. This may bother some senior scholars who use rare book collections.

The most recent addition to the field of mechanical/optical collators is the McLeod Collator. It was invented by Randall McLeod and works on optical principles similar to the Lindstrand Comparator. The major differences between the two instruments are that the McLeod Collator can be broken down for easy portability (it weighs less than thirty pounds); the positioning of the mirrors is more flexible, enabling the researcher to place the documents in several convenient positions; and the person using the collator can sit in a much more comfortable position.

Ultrasound Lamps

The use of ultraviolet light to reveal alterations or additions to documents has been available to librarians for many years. It works on the principle that all materials absorb electromagnetic light waves and reemit them uniformly according to the construction or formation of the object. When a document has been disturbed in some way (by erasing, washing, or restoration, for example) the affected area will fluoresce differently than will the original material. Ultraviolet lamps come in many sizes and intensities. Portable models are available (some with battery packs), and standing models can be equipped with mounts for cameras to record evidence brought to light when exposed to ultraviolet rays.
The Fourth Group

The fourth group consists of common instruments found in every library and private study. They include items like magnifying glasses and rulers. Most of the time they are perfectly adequate to do the jobs for which they are intended, but the fact that they are taken for granted ought to make the librarian pay attention to them on occasion.32

Micrometer Calipers

Micrometer calipers are finely calibrated tools that measure thickness. They are especially useful for measuring the thickness of paper because they are graduated in thousandths of an inch or centimeter. Some are made specially for measuring paper because the micrometer's anvil and spindle faces are lapped and extra-large in order to prevent compressing the paper being measured and to ensure accurate readings. A floating anvil disc which adjusts itself to different surface conditions is especially helpful in measuring the uneven surfaces of handmade paper and cloth case bindings.

Viewfinders

Viewfinders, which are small magnifying instruments that usually rest on the document they are magnifying, come in many forms and styles. They include linen testers, calibrated reticles, eye loupe magnifiers, and type size finders. They are valuable for examining cloth and leather bindings, type, details of illustrations, and paper. Because viewfinders are used by resting them on documents, the bottoms of their bases should be smooth. And whether the sides of their bases are open or transparent plastic, their overall design and construction should allow in the maximum amount of light. Magnification usually ranges from 2X to 8X, with 3X to 6X being the most popular (sometimes lower magnifications are better for examining details on a document, as, for example, an autograph).

Dividers

Dividers are especially useful for measuring binding patterns and multiple lines of type. The most versatile dividers are expandable to 250mm. Often the ends are pointed which may pose a danger to documents. But some are manufactured with blunt ends with fine center points for precise measuring.

Ruler

Rulers seem to be just rulers, but some are better for measuring documents than others. Precision engineering rulers that are machine
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divided provide the most accurate measurements. Rulers should be transparent, flexible, have English and metric calibrations, repeat on both sides, and be calibrated from flush left on one end so they can fit into gutter margins.

There are many more instruments and techniques that are beginning to be employed in the investigation of rare documents. Future research promises to bring to light much new and important information about the composition, history, and possible conservation of books in rare book libraries. Through cooperative projects and the use of equipment now available, librarians can take an active part in promoting and aiding these new methods of research.

References

1. Because there is no collective term for books, manuscripts, and documents that are rare, the word document is used to refer to any and all of them.


5. Before acquiring equipment the librarian should try it out (if possible, in the location in the library where it will be used) and find out about guarantees, warranties, maintenance agreements and costs, and ancillary equipment and supplies that may be required.

6. For some analyses it is necessary to transport the document to the equipment used to examine it. Planning for safety and security is necessary and will likely take up greater amounts of librarians' time as more analyses are proposed and performed.

7. Medical X-ray equipment has also been used to find out how hardened papyrus rolls may be safely unrolled. As time goes on, rare book librarians will undoubtedly find many more uses of available technology for document analysis.

8. A nanometer measures 10 angstrom units or \(4 \times 10^{-8}\) inch.

9. Scanning electron microscopy usually achieves its best resolution at 20 to 50 nm.

10. Linking computers to SEMs can provide image content analysis with "interpretations" provided in tabular or graphic forms.

11. Librarians can learn to use electron microscopes in workshops and seminars offered from time to time in several locations in the United States. Previous experience with scientific instruments is helpful.
12. There is a certain irony here because it is only through analysis that one can know whether a selected specimen has useful and/or representative information. Preliminary investigation with an optical microscope (see later discussion) may assist the researcher in choosing satisfactory specimens.

13. It is always possible to rationalize the extraction of "just one small sample" for scholarship purposes. If a study proves inconclusive, there may be pressure in the future to extract another specimen for study. Good planning, which may include delay, prevents repeated damage to a document.


15. There are precedents in art scholarship where analysis or testing of surface pigments "destroys" a small portion of the object in order to gain sufficient information for restoration or conservation. Whether or not documents should be restored has been debated by librarians for years. The problem may be solved in part through optical or digital disc technology, which can provide an electronic enhancement of a graphic image. Most research may be satisfied with enhanced images. They do not, of course, provide information about details like watermarks which are not normally "seen" in image processing.

16. Many analyses of documents require cooperation among researchers, often to the point where permanent or semipermanent research teams are formed for long-term projects.

17. This situation does not apply to unique documents. And it may not apply to details that are copy specific to a printed book (an example is an autograph presentation inscription). It may be argued that on the microscopic level every analysis of a printed book results in unique information, but statistical analysis usually resolves anomalies.

18. The true potential for the scientific analysis of documents will be realized only when standard samples of specimens are collected. Librarians, bibliographers, and conservators will then be able to compare documents with established standards. Building specimen collections would be a useful project sponsored by the Preservation of Library Materials Section of the American Library Association or by the Bibliographical Society of America. Also, much better bibliographical control is needed for nineteenth-century specimen and sample books that were issued by the various book manufacturing trades.

19. All of the analytical techniques described in this paper are used on finished documents. A thorough knowledge—preferably gained through study and hands-on experience—of the manufacturing processes that produce books and manuscripts is necessary to interpret data obtained through scientific examination.

20. A Polaroid SX-70 camera and adapter is good for microscopic photography.

21. Comparison microscopes are very useful for comparing two specimens simultaneously. With calibrated eyepieces they are good for examining type faces, paper formation, and the weave and patterns in cloth casings.

22. Librarians who want to learn more about document investigation should also read some of the excellent journals, technical reports, and monographs in the area of forensic science. A good place to begin is with Ordway Hilton's Scientific Examination of Questioned Documents. New York: Elsevier, 1982.

23. The CU-5 system is already used in many libraries to copy printed catalog cards.

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25. At the present time only the watermarks in flat paper specimens, such as broad-sides, letters, and maps, can be recorded by the DYLUX method. Additional technical development is needed before watermarks in codex papers can be recorded. Beta-radiography, on the other hand, can be used with codex papers.


29. Personal correspondence with McLeod.

30. Several computer programs are now available to collate printed texts. Mechanical collators for examining graphic images will continue to be used as before. In this regard see: Sternberg, Paul R., and Brayer, John M. "Composite Imaging: A New Technique in Bibliographic Research." Papers of the Bibliographical Society of America 77(no. 4, 1983):431-45.


33. Although this paper does not have space for a discussion of the use of computers for the examination of physical materials, a great deal of interesting work has been done with them. An example is the digital image enhancement of palimpsests. In the future, computers should be used to classify type fonts and faces, which would aid in the identification of anonymous printers of early books. They would also help type designers and manufacturers copyright their creations.
The History of the Book and the Proton Milliprobe: An Application of the PIXE Technique of Analysis

RICHARD N. SCHWAB

The eminent nuclear physicist, Edward McMillan, once remarked, “E.O. Lawrence thinks you can do anything with a cyclotron!” But there is no sign that Lawrence ever dreamed his world-transforming invention would be used as an instrument for the historical analysis of books, including the earliest productions of Gutenberg. The printing press was the most important invention of modern times—at least until the cyclotron—and the team of historians and nuclear physicists at the University of California, Davis, are keenly aware of the connection between the two. Without Gutenberg and the progress of technical knowledge made possible by printing with movable metal type there could have been no cyclotron. There is a sort of historical symmetry in the fact that now with the cyclotron and the technique called the “proton milliprobe” we are able to reconstruct much of the day-to-day chronology of the production of the Gutenberg Bible. It is also possible to apply this technique in such a way as to throw light on some other formerly difficult or intractable problems of the history of the book.

The proton milliprobe, which is an application of the Particle Induced X-ray Emission (PIXE) technology, is a nondestructive method of exciting atoms in a small target area on a page with an accelerated beam of protons, in order to detect, to parts per million, what chemical elements are present in the inks, papers, parchments, and pigments tested. This information, which often amounts to a chemical “fingerprint,” can be used to make a wide range of historical judgments on such matters as authenticity, internal order of production, source and

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era of a document or fragment, relationships between parts of the same
document, the relationship of one document to another, and many
other historical questions. The proton milliprobe method has wide
applications to other historical artifacts besides books and documents,2
but the aim of this essay is to describe the use of the technique for
nondestructive historical analysis of inks, papers, parchments, and
pigments, and to give a brief survey of the kinds of information of value
for the study of rare printed works and manuscripts that can be derived
from it.

Development of the Proton Milliprobe Technique

The unexpected application of the cyclotron to the study of docu-
ments and books grew out of a convergence of two widely separated lines
of investigation on the Davis Campus of the University of California:
Professor Thomas Cahill’s widely-known work in the use of the Particle
Induced X-ray Emission technique for the analysis of air pollution and
my researches on the great eighteenth-century Encyclopédie of Diderot.
The latter project resulted in a seven-volume history and inventory of
the Encyclopédie, which was designed to establish, among other things,
what the “pure” or “ideal” text was, out of a confusion of variants,
cancels, censored pages, and counterfeit editions, so that the study of
that monument of the Enlightenment could be set on a systematic
footing.3 Through a series of fortuitous circumstances, Cahill and I
became well acquainted, and each of us learned in some detail what the
other was doing. In 1978 we hit upon the idea that the PIXE technique
used by him in his laboratory research might be turned to problems in
the history of the book and physical bibliography that were preoccupy-
ing me. Cahill, who by then had become director of Crocker Nuclear
Laboratory, had a strong interest in historical questions, and he set
about developing special techniques for using the cyclotron to examine
questions of counterfeits, cancels, and variant editions of the Encyclo-
pédie as well as other printed and manuscript works. Starting with some
tentative but promising experiments in 1978, we established a program
of research in which nuclear physicists and scholars in history and the
other humanities cooperated on an ever wider range of problems of
historical and archaeological research, but with our central focus on
Gutenberg and the incunabula period. There were few other locations
where the conditions favorable for such a collaboration existed. It is rare
to find a director and other scientists in a nuclear laboratory interested
in the challenge of historical research capable of devising plans for the
apparatus and technique necessary to get at these questions, and in a

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position to offer the laboratory facilities and the time for historical and archaeological work. Taking advantage of this situation, we believe that we are firmly establishing a new auxiliary historical, archaeological, and bibliographical discipline that has wide applications in the study of the history of the book and physical bibliography; and we have formed a permanent organization—The Crocker Historical and Archaeological Project—on the Davis Campus to carry forward several projects of research of this kind.

How the Proton Milliprobe Works

This auxiliary branch of historical and bibliographical research is made possible because of the discoveries of nuclear physicists and chemists in the twentieth century about the nature and behavior of atoms and subatomic particles. These discoveries have been widely enough publicized so that most knowledgeable readers understand that atoms of various elements are made up of nuclei with positive charges surrounded by orbiting negatively charged electrons or successive “shells” of orbiting electrons. The atoms for each element have a characteristic nucleus and a specific number and arrangement of what might be viewed as rings of electrons circulating around their nuclei. Through the bombardment of these atoms with a high energy beam of subatomic particles accelerated in the cyclotron, certain revealing measurable reactions occur. In our case it is a beam of protons, which are subatomic particles that are the equivalent of the nuclei of hydrogen atoms. A certain number of the accelerated protons in the beam speeding from the cyclotron collide with a certain number of the electrons orbiting the nuclei of the atoms of the different elements present in a target area, which in our investigations is approximately a square millimeter of ink, paper, parchment, or pigmented area in a book or document. Whenever that collision happens, an electron from the atom is knocked out of its orbit and another electron must rush in to replace it in order to keep the positive-negative balance of the whole atom.

It is at this point that the critical phenomenon occurs for our analytical purposes. Whenever an electron is knocked out of its orbit around an atom of a certain element present in the target and another electron rushes in to replace it, there is an X-ray emission generated that can be detected and measured for its energy by a very sensitive silicon-lithium detector close to the target. In this process the X rays generated for atoms of any given element have a known energy specific to that particular element. That is, the X rays generated from an atom of copper have a measurably different energy from X rays generated from an atom...
of lead. Because of this we are able to detect from the X rays emitted during the collisions what elements are present in the ink, paper, or parchment we have as our target. The energies of the detected X rays give a direct measure of the elemental composition of the materials in the target. After the very brief excitation by the proton beam, the atoms in the small areas we analyze instantly return to their normal state.4

It was not until 1970 that Johansson, Akselsson, and Johansson first perfected the Particle Induced X-ray Emission technique for multi-elemental analysis. Cahill saw the applicability of that technique for the rapid and accurate detection of pollutants in the atmosphere; and creating the necessary apparatus, he launched one of the most successful air quality analytical groups in existence.6 The technique used by Cahill and his colleagues in collecting air pollutant data is to pass an air flow through a thin filter which catches samples of pollutants in the atmosphere that can then be analyzed by the PIXE system for elements in the particles. All elements in the pollutants caught on the filter, from sodium and above on the periodic table, can be detected to parts per million through the proton milliprobe technique. What struck us as we discussed our various projects in history and physics during 1978 is that the filters with particles of air pollutants on them constitute a close parallel to papers or parchments with ink or other pigments on them. In fact, in an illustrated lecture about our technique, Cahill began with a slide depicting an enormously magnified, rather ugly irregular black particle of pollution from an air sample on a filter and quite correctly asserted that it was with this kind of black blob that our story begins. We could see that there was no reason that the proton milliprobe could not be used for multielemental detection of the materials in the pages of books or other documents. The critical virtue of this technique of multielemental analysis of papers, parchments, inks, and other pigments in rare and fragile works was that it would be completely nondestructive since only an instantaneous disarray of the electrons of the atoms in these materials would occur as they were bombarded with protons to excite the emission of X rays. Thus unique multielemental chemical “fingerprints” could be made, yielding information about the elemental composition of materials in the documents we might wish to test, and after a PIXE analysis it would be impossible to tell—even with instruments far more sensitive than the eye—that an analysis had been performed. No scrapings of inks or fibers needed to be removed for analysis.

Intrigued by the potential utility of this technique for historical documents and artifacts, we set about to make simple experiments which confirmed that indeed very useful information could be discover-
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ed quite easily and rapidly. In order to test large pieces of paper or vellum—either as separate sheets or bound in books—it was necessary to modify the apparatus used for the analysis of the air filter samples, which were the size of photographic slides and tested by remote control within a vacuum tube. Cahill and his fellow physicists and laboratory technicians designed and constructed an apparatus for the target area so that the proton beam could pass out of the vacuum tube and into the air. That made it possible for books and other objects of any size to be mounted on special supports and oriented in front of the proton beam at precisely the locations where we wished to make the multielemental analyses. Figure 1 depicts the equipment as it was ultimately perfected in Crocker Nuclear Laboratory for the testing of material on separate leaves or fragments of manuscripts and printed documents and for testing materials of the pages of bound books. A completely safe system for focusing and controlling the energy of the proton beam was assured so that it could not possibly harm even the most fragile object through any heat generated in high energy excitation. The heat effect upon the document for any analysis of a square millimeter is comparable to the effect of a 100 watt electric light shining on an area of the same size for the same amount of time at a distance of 50cm. Moreover, for the investigators standing directly next to the apparatus and holding or adjusting the object to be tested, the minute energies of the X rays emitted from the collision of the protons with the electrons of the atoms in the target area are less than one would receive from wearing a watch with a luminous dial. Therefore, a special authorization was granted by the campus laboratory safety officer, according to strict federal standards, to permit the researchers in our project to stand beside the works being tested during these analyses with no chance of physical harm coming from radiation. This is absolutely essential in the analysis of any rare manuscript or book, because the investigators must, of course, be immediately present to position the documents, to hold them in place, to arrange and maneuver the “lectern,” to turn pages, and generally to make sure by directly handling them that no harm can come to the objects being tested. Analysis by remote control on a large scale is not feasible for these materials. Since the fate of the project is absolutely dependent upon its nondestructive nature, we are, if possible, stricter in protocols of procedure than the rare book owners or curators who have brought works to our laboratory to be tested. In all the tests of rare works, it is our policy that a curator or authorized agent of the owner must always be present to witness and participate in the analytical procedure.
Figure 1 shows in a schematic way how the analytic apparatus is constituted. Starting from the right we see a representation of where the beam of millions of protons shoots down a tube after having been accelerated in the cyclotron. The beam is focused and controlled by electromagnetic collimators. It emerges from the kapton window at the end of the vacuum tube passing through an atmosphere of helium that has driven out the air that might have particles that would be detected and cause confusion in the analysis. For many analyses, however, it is not necessary to use the helium, and we can subtract from our final results the elements known to be in the air. Moving toward the left, the beam passes through a hole in an aluminum plate (the target plate) which is represented by the long, narrow rectangular form with the cross-hatching on it in the illustration. The break in the middle of it represents the hole. When a document or fragment is being tested, it is rested on the left side of this plate and the proton beam passes straight through it from behind—much as a cosmic ray or an X-ray would pass through a solid. It is at this juncture that a very small percentage of the protons in the beam collide with some of the electrons orbiting the atoms of each of the elements in the paper, ink, or other sample being analyzed, at exactly the spot one millimeter square we wish to test for its...
elemental composition. The resultant X-ray emissions (each of an energy specific to the atom of the particular element involved) are represented by the wavy line going down toward the silicon-lithium detector. Actually these X rays go out in all directions from the atoms whose electrons have been knocked out by the protons in the beam, but the detector collects only a portion of them radiating down to the aperture of the detector. Well-established calculations indicate how much of the X-ray emission in each collision is collected in the detector. For clarity, only one line of X-ray emission is shown here, but actually in a fraction of a second a multitude of X-ray generating collisions occur when electrons of atoms of all the elements present in the square millimeter of paper, parchment, ink, or other pigment are bombarded by the protons in the beam. The detector and the computer associated with it sort out these X-ray emissions, according to the elements that produce them, and in a matter of seconds we can see on a screen a graph of the elements and the quantities of each element detected. Shortly thereafter the numerical values for each element found in each single brief analysis are printed out from the computer.

There is a great advantage to the speed that elements present in the point being analyzed are detected, for it enables immediate decisions to be made in the course of the analysis to retest or to check something close by on the same leaf or fragment or retest a related document or fragment if something interesting or unusual appears in the results. It also provides the chance to see immediately whether there is a pattern taking form in the multielemental results seen in various pages or parts of pages treated. This circumstance has been of inestimable help numerous times as large works were analyzed, such as the Gutenberg Bible, for we have been able to improve or modify the program of investigation profitably on the spot. Another substantial advantage of the speed of the individual analyses is that it reduces the costs of the large projects of investigation, which sometimes involve testing hundreds of pages. Considering the amount of information derived from each one- or two-minute analysis, the technique is incomparably less costly than what would be the case if similar analyses were made in a chemical laboratory.

Two of the most useful additions to the original simpler apparatus which preceded the one in figure 1 are the system of mirrors shown here and a laser aiming device. The laser beam is directed exactly at the point where the proton beam will hit the target. Thus, the laser light can be used first to orient the document precisely at the place where we want the PIXE analysis of the material being tested to be made; the bright
laser beam usually shines clearly through the paper or parchment so that, as we stand facing the target, exactly what will be hit by the proton beam can be seen. The mirror arrangement also permits inspection of the letters or other parts of the document being tested, which is of course resting face down on the target plate, and this helps in another way in orienting the page or fragment so that it will be analyzed with the proton beam exactly where the test is to be made.

For the testing of large bound books such as the Gutenberg Bibles and many other bulky works, it was necessary to devise a special lectern so that the individual pages could be positioned quickly and safely upon the target plate (see fig. 2). The lectern was the product of detailed consultations with rare book conservators, for it had to be designed so that it would hold a volume securely, make it possible to position a single page of a bound volume correctly on the target plate, but in no way put a strain on the binding or the pages of the work that they would not ordinarily get from normal reading. The lectern mechanism is designed so that there can be precise adjustments of the book up and down or laterally in relation to the target plate and the proton beam coming through it. After a period of experimentation with volumes of little or no value and on-the-spot observations of the apparatus in action by rare book specialists, the lectern and all other parts of the apparatus for testing were perfected so that the owners of Gutenberg Bibles and other extremely valuable works were fully satisfied and willing to bring their volumes to the laboratory for testing.

The method of preparing a bound volume for analysis and the actual procedure of the analysis is as follows. First exhaustive measurements of the work to be tested are made and all its physical features are examined so that the lectern can be prepared exactly to the specifications of the book. This often entails mounting foam rubber wedges and other "furniture" to assure that the book will rest securely on the lectern. For books with bindings that are too stiff to permit them to be opened flat, appropriate foam rubber supports are placed under the covers before situating them on the lectern. A good deal of time is taken with this "make-ready" before proceeding with the analysis, and these preparations are always made in close cooperation with the owner of the work to be tested or a representative of the owning institution. The volume to be analyzed is secured on the lectern with two wide felt-covered paddles in such a way as to leave several pages at a time free for testing. The lectern is then swiveled and locked into a position so that the angle of the pages to be examined is exactly at the angle of the target plate. One by one the pages to be analyzed are rested on the target plate. The lectern is then adjusted upward or downward or laterally until one can see by the laser
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Figure 2. The Lecturn in Position for the Analysis. Leaf Resting on Target Plate.

aiming beam and through the mirrors that the targeted letter, part of a letter, or some other part of the page is exactly where the proton beam will pass through. Then a Faraday cup is lowered gently upon the leaf just over the targeted area, and the signal is given to the control room to switch on the proton beam for the desired number of seconds needed for the analysis. As described earlier, protons in the accelerated beam collide with the electrons orbiting the atoms of the various elements in the target area and the X-ray emissions are generated. These are instantly picked up by the detector, and in a short time the computer registers what elements are present in the target area, the absolute quantity of each element from trace amounts upward, and, where required, what the ratios of certain elements are to others in the sample. Immediately we proceed to the next analysis, which is often on the same page, or another page is positioned on the target plate.

This process, in large projects such as the analysis of all the papers and inks of the Gutenberg Bible volumes, may take up to forty hours of continuous laboratory work. It is uneconomical to stop the cyclotron once the time has been taken to calibrate it and carry through all the steps necessary to get it operating precisely as needed. Therefore, for the large analyses, there is a continuous succession of four-hour shifts of the
three teams of investigators continuing day and night until the project is completed. The cost per analysis (which often gives over a dozen pieces of chemical information) is quite remarkably small, however costly it is to run an impressive machine such as the cyclotron, because of the speed at which the analyses can be made once the system of operations is in motion. It would be hard to match the economy of analysis of this process with comparable chemical analytical techniques of any other kind, whether destructive or nondestructive.

If a small, light book were to be analyzed, the lectern is not necessary or practicable. In those cases, one of our group or the curator simply stands next to the target plate and holds the work open while one of the pages is being tested. The operation is carried through with perfect safety for the book and for the people doing the testing. Because the hole in the target plate through which the beam comes is a few inches from the end of the plate, there is a limit to how far in toward the gutter the page can be analyzed. This is also partially determined by the condition of the binding and how far the book can be opened without suffering strain. All of these questions are judged in consultation among the group and the owners, and there is a strict rule always to err on the side of conservatism since the continued success of the program depends on it.

There is a special technique whereby good analyses of paper, ink, pigments, and parchment can be achieved by laying a book opened to the page to be tested, face down on the target plate, and placed over the aperture through which the proton beam passes at precisely the spot to be examined. In this case the beam does not go through the object to the Faraday cup, where it is stopped, as shown in figure 1. Instead the beam only penetrates the page exposed to it and is stopped once it has done that by a thin shield of inert material that is inserted on the other side of the leaf. The analyses made this way are not quite so sensitive as those made when the beam passes through the leaf and into the Faraday cup, but good elemental data is obtained with this method as well. The same technique is used when a leaf being tested is so thick and opaque that the beam cannot penetrate it.

Cahill is working to develop a special apparatus to enable the beam to get to inaccessible points in the inner margins of small works or works whose bindings permit them to be opened only partially. It will be called the "snout," an accurate albeit inelegant name for a delicate and useful instrumental proboscus.

The results of the proton milliprobe analyses are printed out of the computer in a number of different forms according to what will be most useful for our particular purposes. The information is printed out in
columns for a certain number of elements that are particularly interesting for our investigations, and at the end of such a readout the computer is programmed to note the presence of other elements that only occasionally are present in the samples of writing, printing, paper, or vellum tested. The data can also be given in numbers of nanograms per square centimeter of each element found in the sample. In this and the other forms of presenting the data generated, the computer can be directed to include the error calculations (plus or minus) for each value. The ratios of various elements to one another are particularly helpful for historical evaluations of the evidence. In papers and parchments it is helpful to have data expressed as ratios of various elements detected to calcium, which is the most plentiful and constant element that can be measured in these materials. In the case of the remarkable Gutenberg Bible ink, which has large amounts of copper (Cu) and lead (Pb), the computer is programmed to give a full report of the Cu/Pb ratio of the ink on every page tested. The comparative evaluation of all this information about the Cu/Pb ratios in the inks throughout the pages of the work has provided the key to determining what must be close to the day-to-day production chronology of the Bible (as will be more fully described later). Occasionally it is useful to have the computer print out vertical dotted lines representing the magnitudes of the Cu/Pb ratios, to provide a graphic picture of the changing patterns of ratios. Whatever form of numerical records is chosen, printouts are received in a matter of minutes, which has the advantage previously noted of allowing adjustments of the experimental procedures according to what we see is occurring.

The PIXE technique has these limitations: it cannot give data on elements below sodium on the periodic table. Thus there are some entirely organic inks that have no elements that are detectable by this method. In those cases, the analysis is concentrated on what the paper or parchment can reveal about the documents in question, for they always have some detectable elements in them. Moreover, the proton milliprobe gives measurements of elements present, but it does not tell what compounds are made up of those elements. However, it is often possible to reason what compounds must have been involved from seeing the proportions of the elements present and from other historical information about the manufacturing technologies for paper, ink, pigments, and parchments.

In summary, the cyclotron beam technique, or proton milliprobe, is fully developed, and it has been put to use effectively for several years. It provides a heretofore impossible capability to make completely non-destructive multielemental chemical analyses of the inks, papers, parch-
ments, and pigments of the rarest and most fragile works. It combines very subtle analyses (to parts per million for elements from sodium and above on the periodic table) with an accuracy of focus down to a square millimeter in any area to be tested. This permits the investigation of the chemistry of a punctuation mark, a part of a letter, or a small fragment of paper, pigment, or parchment. The necessary computer programs have been worked out and the protocols to be followed in coordinating the functions of each member of a team of cooperating investigators from widely different fields in the analysis. The physical procedures have been developed and refined to achieve a safe and precise orientation of whatever is to be tested so that the proton beam coming from the cyclotron penetrates exactly where it is directed. A specially designed lectern permits the positioning of a book to be analyzed so that no harm whatever can come to its binding, paper, parchment, inks, and illuminations.

General Considerations in Analyzing Books and Documents

Initial testing in each project must always be made to see whether the paper and ink being analyzed is chemically homogeneous from one part of a page to the next. In the studies of the Gutenberg Bible volumes brought to Crocker Nuclear Laboratory, one is helped greatly by the fact that individual sheets of its paper are remarkably homogeneous chemically. Thus in a long examination of hundreds of pages one can enjoy high confidence that one analysis per page will suffice. The Gutenberg printing ink is similarly consistent in composition on a single page. This homogeneity derives from the manner in which the paper and the printing inks were manufactured. Each sheet of handmade paper in the Bible must have been drawn out of a well-mixed, and therefore chemically consistent, vat of material. At least the quantity of material deposited on the mold each time the papermaker passed it through the vat to make a single sheet was chemically homogeneous. The typographical ink impressed on each page apparently was ground and mixed for each "batch" so that it must have reached a homogeneous consistency before it was picked up by the inking device and applied to the formes of metal type. By repeated analyses on various parts of a single page, it was found that the ink chemistry is very consistent in each mixture of ink, and thus one could make a single analysis of ink for each page and be confident that its chemical makeup represented the ink chemistry for the whole page. However, as will be seen, the ratios of elements in the ink varied in a detectable way during the long course of the printing of the Bible as
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numerous slightly different mixtures of the ink were made up and put into use.

Vellum presents a more complicated problem. A single sheet of vellum may have a generally consistent chemical profile, but there is much more chemical difference from one part of it to another than in a paper sheet. Therefore, it is not nearly so easy to produce distinctive results in testing vellum as it is with testing paper and printing ink. Several analyses need to be made per page of vellum and statistically averaged.

Manuscript ink has been found sometimes to be variable from one word or line to the next, possibly because of a different consistency of the ink in a well from the bottom to the top of it. Moreover, sometimes manuscript ink dries in layers that vary from one another chemically, and these layers wear off or chip off unevenly over time. That might account for variant chemical readings from spot to spot tested. Proton milliprobe testing has shown that occasionally there is a chemical difference in the ink even from the beginning of a single stroke to the end. However, testing of manuscript inks by this method shows also that the general mixture of ink on a page or document is usually consistent even though there are considerable variations depending on the particular spot of the writing being tested.

In sum, regardless of what is examined with this technique, one of the first tasks is to investigate the question of how homogeneous the chemical composition is in the various parts of the item analyzed. That knowledge determines how many analyses need to be made on one page, and it also opens such questions as whether there have been revisions, touching up, patchings, and substitutions.

Results Using the Proton Milliprobe and Historical Judgments that Can Be Made

Although we have been very fortunate in examining books and other objects with materials that have yielded exciting and comprehensible results, it is impossible to predict in any particular case whether anything will be found that is decisive or comprehensible. Only the testing determines that. It is known, of course, that one will always be able to detect what elements from sodium and above are present in the target, but what these elements mean is the main question. Sometimes it may be years before the significance of certain chemical analytical results can be known, perhaps only in the context of other information accumulated. A permanent record of the analysis is retained in that eventuality.
As our technique of nuclear historical research and physical bibliographic analysis is applied more and more widely, a background of information will be built up which will no doubt permit judgments about what works are most likely to yield valuable historical information; and it will allow us to predict with greater and greater probability what can and cannot be accomplished. The proton milliprobe branch of historical study is only in its infancy, and though it has produced very substantial, exciting, and promising concrete results, it will be some time before its full potentialities can be realized. With that caveat stated, one can turn to examples of some of the interesting uses to which the proton milliprobe has been put with positive results at Davis, particularly in the analysis of ink and in the analysis of paper.

**Analysis of Inks in Books and Manuscripts**

Inks have been studied a good deal less rigorously and less effectively by bibliographers and historians than papers have. Very little testing of the materials of inks has been done for the obvious reason that curators or collectors of rare works would rightly blanch at the thought of the removal of samples of ink by scraping for chemical analysis. Although some knowledge can be gained about ink through visual examination, especially with a strong magnifying glass or a microscope, and some judgments can be made by observing the color of the ink and its behavior on a page, much of this is impressionistic and hardly scientific. However, there is enough information about inks in studies by Wiborg, Carvalho, Bloy, and others so that it is known at the outset that there have been innumerable techniques and recipes for the manufacture of ink in all the literate centuries and areas of world history. Now that there is a nondestructive technique for the multielemental analysis of inks of all kinds, there is the possibility of greatly expanding the part the study of ink can play in historical and analytical bibliographical studies.

The most satisfying and significant results in the testing of inks with the proton milliprobe technique have come in the analysis of early printing inks, particularly those in works done by Gutenberg or alleged to have been done by him. Typographical inks have varied greatly from the beginning of the history of printing with movable types to the present, as Bloy's collection of recipes shows. The constituent parts of the inks are different according to time, place, ink maker, or printer. The analyses will always show whatever elements are present in the ink from sodium and above. This might include elements in the pigment of the ink, in the oil base, in additives of one sort or another, in driers, and
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perhaps even in the instruments used for applying the ink to the types (e.g., urine in the ink balls). If there are elements that can be recorded by the detector, then one can find out what they are and how much of each is in the area analyzed. One of the most startling discoveries made at the Davis laboratory was that Gutenberg's ink has an especially highly metallic chemical "fingerprint" which has been the key to the solution of a number of formerly intractable problems in Gutenberg scholarship. A full-dress program of sampling other printing inks from Gutenberg's time to the present century will show how far one can go in building up a general index of the inks used by certain printers or used in certain areas and times. Ultimately, the intent is to carry through such a program, focusing at first on the incunabula period.

While concentrating for the most part here on the kinds of information that can be derived from the analysis of printing inks, at the same time some of the specific capabilities of the proton milliprobe that are applicable as well to the study of manuscript inks, colored writing, rubrication, and painted titles, chapter headings, and decorations in books will be described; for the same techniques are used in the testing of any form of writing or decoration in a book.

Where there are enough elements present from sodium and above, the proton milliprobe can tell easily whether the same general ink recipe was used throughout a single work or whether any new or different recipe was used during its production. There was a radical and clearly detectable change, for instance, in the ink recipe for the printing of the second impression of the early pages of the Gutenberg Bible. Also, depending on the detectable metallic content of the ink, cancelled, forged, or replacement pages or sections of a work can be detected by their ink chemistry. It was through ink evidence that a hitherto unknown cancel page I, 134 in the Doheny copy was discovered during the Doheny analysis, for example.

Within a single page, the capability of focusing the proton beam nondestructively on a square millimeter makes it possible: (1) to isolate the ink on individual letters from the rest of the text; (2) to focus on part of a letter that is suspected of being altered or patched in some way; (3) to isolate added or altered words and passages; (4) to detect whether punctuation has been inserted after the original writing that might affect the original meaning. This is a serious problem in some manuscript texts.

In the proton milliprobe technique, the proton beam penetrates the ink on one side of the page and the paper or parchment upon which it is written. Thus the multielemental readings from each analysis give us the combined chemistry of ink-and-paper or ink-and-parchment. In
order to find the composition of the ink *alone*, another analysis is made of the paper or parchment without ink on it, and the figures for the elements found in the paper or parchment are subtracted (see example in fig. 3). This is a simple process if the ink is on paper, for it is known that the chemistry of the paper is consistent throughout each sheet. But in the case of vellum, whose single sheets are much less consistent chemically, closely paired analyses must be made: first of ink-plus-parchment and then of parchment alone in a spot as close as possible to the point where the ink was analyzed. By subtracting the parchment figures from the ink-plus-parchment figures the values for the ink alone can be determined.

The capacity of the proton milliprobe method to distinguish among different smaller or larger mixtures or "batches" of an ink of the same general recipe turned out to be crucial in the study of the chronology of production of the Gutenberg Bible. The evidence shows that Gutenberg sometimes used a specific single mixture of his highly metallic ink recipe for printing off the complete run of all copies of six concurrently printed pages (all 150 to 180 copies each of, say, I, 74v; 114v; 201v; 273v; II, 57v; and 202v, which are the "Pole Star" pages, to be discussed later); and then he used a different mixture for the whole run of the next line of concurrently printed pages. The Cu/Pb ratios of separate mixtures of Gutenberg's ink are measurably different from one another because each "batch" was made without measuring out its ingredients with minute precision.

This was a fortunate circumstance for the historical Davis study, because the differences among the Cu/Pb ratios of the many separate mixtures of ink needed throughout the long period of time it took to print the Gutenberg Bible yielded the vital evidence necessary for the exact reconstruction of the chronology of the printing of the work. Therefore, great pains were taken to find locations on each Gutenberg page where one could have the proton beam hit where there was printing on only one side of a leaf. Otherwise the combined ink readings for both sides of the leaf would have been detected since the proton beam would have passed through the ink on one side, then the paper, and then the ink on the other side—activating X-ray emissions from atoms in all three. In cases like these the very bright laser "aiming dot," which was visible through the page, was essential. It permitted the orientation of the page so that only one ink deposit was analyzed.

Thus, in the analyses made of the Doheny Gutenberg volume I, the Lilly Library Gutenberg New Testament, and the Harvard volume II, the ink evidence has provided an amazingly accurate means of tracking the chronology of the printing work, page-by-page. It showed precisely
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Figure 3. Graphs of Two Analyses, One of Paper Alone, the Other of Ink and Paper, for fol. 100 of Volume II of the Gutenberg Bible, Lamentations. It can be seen at a glance how the Ink Values are Derived by Subtracting the Paper Values of the One Graph from the Ink and Paper Values of the Other. The Result in this Case Shows Large Concentrations of Lead and Copper in the Ink.

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which pages were being printed concurrently, when a new organization or distribution of the work in the shop was made, when accidents or delays occurred, and how they were rectified. This is reported in quite technical detail in various articles published in *Papers of the Bibliographical Society of America, Nuclear Instruments and Methods*, and elsewhere.\(^\text{10}\) It is startling to see how exactly the ink evidence correlates with Paul Needham's intricate study of the paper sort evidence. The unusual correlation of anomalies in one place occasioned Needham's comment: 'One can almost hear, across the centuries, the faintly echoing creak of the press as inked types were pushed into paper.'\(^\text{11}\)

Anomalies in the ink sometimes occur in clusters with other anomalies, such as peculiarities in the patterns of the pinholes. Further analysis of both the anomalies and the many striking regularities of the ink Cu/Pb patterns may reveal other details about the history of the Gutenberg Bible and even the apparatus that was used to produce it—details that have been lost since no written records whatever have survived about these matters, if there ever were any. We are at the point where a large number of the pieces of the puzzle of the printing organization and chronology have snapped into place. Schwenke made a great contribution with his study of typographical and paper sort evidence. Now we are able to correct and perfect his admirable studies and enter areas where he was bereft of any sufficient evidence, as for instance the order of printing of the last quires of the Bible, when work assignments were apparently juggled back and forth to keep the printing crew busy after they completed their usual assignments.

Figure 4 is a draft chronological chart of the production of the Gutenberg Bible based on the ink evidence in the Doheny, Lilly, and Harvard copies, as well as on some separate leaves and separate books from the copies broken up by Gabriel Wells and Scribner's. Although the chronological chart is not in its definitive state because all versos in volume I and the inks in all the pages of the second impression have not been analyzed yet, it shows how far ink evidence has already taken us in working out the exact page-by-page chronology of the production of the Gutenberg Bible. Using parallel patterns of variations in Cu/Pb ratios in the inks on individual pages, we are able to confirm beyond any doubt that the Bible was ultimately produced in six compositional units being composed and printed concurrently. (This does not mean, however, that there were six presses. Two or three presses could have handled all the actual printing.) Parts of a manuscript copy text of the Vulgate were assigned to the compositors in a well-planned distribution of work assignments. We now are able to tell by ink evidence precisely when each of the compositional units listed as A through F in the chart was
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put into production with reference to the other concurrently printed units. Moreover, we are able to determine exactly which were being printed concurrently, possibly on the same day. One of the most striking pieces of ink evidence is what we have called the “Pole Star” pages (marked with a star on the chart). These all have an anomalously high Cu/Pb ratio in their inks, indicating that a special mixture was used on the day, or days, those pages were being printed concurrently. The other most striking ink phenomenon is what we call the “Tower clusters,” the first pages of which are marked with a “T” in the chart. These are clusters of pages with notably high Cu/Pb ratios in their inks, so that when the ratios are represented graphically the lines for the Tower clusters rise high above the lines for the pages on either side of them. These Tower clusters were printed exactly concurrently in each of the compositional units, and they also mark a fixed point in the chronology and organization of the printing. By combining the ink data from the Pole Stars and the Towers we are able to determine with remarkable precision what a good share of the production schedule in Gutenberg’s shop was. The ink evidence correlates perfectly with other evidence from the paper sorts and from particular typographical characteristics in the printed text. We are even able to determine exactly when there was a delay in the production in one unit and to show how it “caught up” shortly afterward with the rest of the printing operation going on concurrently.

A substantial number of other facts about the day-to-day production of the Gutenberg Bible have also been uncovered through our ink analyses, including the formerly intractable problem of the timing and distribution of the work assignments on the later quires of volumes I and II. The details of the new Gutenberg evidence and conclusions derived from ink analyses are discussed fully in our articles in Papers of the Bibliographical Society of America. In the same journal Paul Needham shows how the ink, paper, and typographical or compositorial evidence reinforce one another and how a discovery in one category of evidence leads to discoveries in others.

Although the major efforts have been directed at putting together pieces of the puzzle of the production of the Gutenberg Bible itself, we have also been able to analyze one specimen of the 31-line Indulgence, four fragments of leaves from the 36-line Bible, and the Sibyllenbuch fragment. All of these works were printed with 36-line type, and they are at the center of the debate over whether there was another printer, called “the 36-line printer,” who was a contemporary of Gutenberg and was responsible for the printing of several of the earliest incunabula. PIXE analyses showed that these works in the 36-line type all have
Figure 4. Chronological Chart of the Production of the Gutenberg Bible, Based on Ink Analyses of the Doheny Copy, Vol. I, the Lilly New Testament, and the Harvard Copy, Vol. II.

highly metallic inks whose copper and lead content put them in the same family with Gutenberg's remarkable ink in the 42-line Bible. There is still more work to be done in evaluating results of the analyses of these fragments; but we can assert that the ink evidence greatly raises the probability that Gutenberg and the 36-line printer were the same person. Such are the kinds of questions in the earliest history of the book that can profit from the proton milliprobe technique.

It is desirable that a long-term analysis of inks of other early printers in the hand-printing period will be undertaken, for this enormous fund of potential material for cyclotron research has hardly been touched. Recipes for later typographical inks recorded by Bloy give grounds to believe that many producers of ink included peculiar detectable metallic constituents in their printing inks. Only further testing will tell which works will yield comprehensible ink information, but if the evidence is present the capacity to discover and analyze it.

It is certain from a number of proton milliprobe experiments at Davis that there are enough trace elements in some manuscript inks to permit useful historical judgments. Manuscript inks with a water, gum, or other liquid base have been in existence for millennia, and the manner of making them and applying them with brush, stylus, and pen has been extremely varied from place to place and era to era. There are radically different manuscript inks depending upon the substances used.
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to give the color and tone, whether black or some other color. Many of the recipes for making inks have survived from ancient, medieval, and modern times, while others have been lost or were trade secrets that died with the scribes or dynasties of scribes who used them. Chemical compounds of one sort or another were used to give them a special tone or consistency, to make them resistant to fading, to serve as driers, and to permit their most convenient use and storage. There are major categories of inks such as those based on lampblack, iron gall inks, and inks derived from other metallic substances, vegetable dyes, or the secretions of sea creatures and insects.

The surface has only been scratched in the PIXE analysis of manuscript inks, but useful results have already been achieved. An example is the complex analysis of the annotations in J.S. Bach's Calov Bible, where Bruce Kusko of our research group was able to provide laboratory proof that most of the underlinings and annotations in the work were done by Bach himself, since the subtle chemistry of the inks in the markings about which there was uncertainty harmonized with the chemistry of the inks used in those annotations known to be in Bach's handwriting.15

The most extensive testing of manuscript inks, besides the analysis of Bach's annotations and underlinings in his Calov Bible, has been the analysis at Davis of the ink in the controversial Vinland Map of the Beinecke Library at Yale. Here 159 analyses were made of the ink and the parchment of the map. Many of these were "paired" analyses of millimeter segments of the ink line with the parchment next to them, in order to allow for accurate subtraction of the elements in the vellum from those in the ink. Considerable variation was found in the ink readings from one part of the map to another, partly because of the deteriorated condition of the ink lines and partly because manuscript ink does not go on paper or parchment as consistently as printing ink does. However, evidence of historical value in the ink composition was found. Various parts of the ink mixture on the map had a number of trace metallic elements, including some traces of titanium, which has played a great part in judgments on the authenticity of the map. Several years ago McCrone Associates removed a few small scrapings from the surface of the map to test by several laboratory techniques. Among their micro-particle samples of the ink they detected a few titanium dioxide crystals, at least one in the form of anatase, and on the basis of that evidence they judged the map to be a twentieth-century forgery instead of a pre-Columbian chart showing Vinland.16 They concluded that the yellowish-brown portions of the lines on the map were due to an ink whose pigment was based on crystalline titanium dioxide (TiO₂); and
since pigments based on TiO$_2$ were first manufactured only in the twentieth century, the map must be a forgery. However, on the basis of repeated testings of the ink with the proton milliprobe method we do not agree that the McCrone Associates' analysis demonstrated the Vinland Map to be a forgery. Our technique with the proton beam analyzes the whole cross-section of the ink, since the beam passes through all the layers of the ink, whereas McCrone Associates analyzed only a very few aliquots or micro-particles removed from the surface of the ink line. It is not justified to assert that these tiny surface particles are representative of a whole ink mixture. While McCrone Associates reasoned from the surface aliquots that the ink was made up of up to 50 percent anatase (titanium dioxide), we found in repeated measurements of the whole cross-sections of the inks that wherever titanium was present it was in minute trace amounts no larger than the trace amounts of several other transition metals (iron, zinc, copper). Nowhere was there enough titanium to cause any pigmentation at all. In many places there was no trace whatever of titanium in the ink above our minimum detectable unit of 0.02 ng, including in parts of the map lines most highly suspected of being forgeries, done in the allegedly titanium-based yellowish-brown ink. Titanium dioxide of whatever date or source could not therefore have been the source of this ancient looking layer of ink on the map. The conclusion of the Davis group was that the Vinland Map ink is not at all proved to be of twentieth-century manufacture. This, of course, reopens the historical debate about the authenticity of the map. It must be emphasized, however, that our analyses have not proved the map is authentic. It may well be a forgery, which some think that it is for other than chemical reasons; but it is certainly not yet scientifically demonstrated to be a forgery.

Even on the basis of limited experience with manuscript inks, the Davis team investigators have found that the proton milliprobe can be applied very profitably to ancient, medieval, and modern manuscripts for the examination of such questions as authenticity, place and era of origin, whether or not a document has been touched up after it was originally written, and for the investigation of many other historical questions that can be raised about a document. After many years of analyses it may be possible to build up a register of manuscript ink profiles characteristic of different regions, periods, and scribes that will be a valuable archaeological and historical instrument, especially when the testing is done in connection with the many facts that can be discovered through the analysis of paper, parchment, and papyrus.
History of the Book and the Proton Milliprobe

The Analysis of Paper

The cyclotron proton milliprobe is peculiarly suited for the minute nondestructive multielemental analysis of papers of all kinds and conditions. As in the case of inks, the testing yields results, to parts per million, for all elements in paper from sodium to the end of the periodic table. As noted earlier, the beam can be focused on any portion of a leaf or fragment down to a millimeter across so that a reading can be taken literally between lines of print or script, if necessary, or exclusively in the margins. This is one of the most useful features of this technique. It is important for the study of papers that have been stained, patched, cosmetically bleached, or otherwise treated by collectors or booksellers.

This minute focusing capacity has been taken advantage of, for instance, in analyzing the Riverside leaf of the Gutenberg Bible, which comes from the ill-fated copy rescued in 1828 by Wyttenbach from a peasant’s house in Olewig near Trier. It was patched with newer papers in its margins and bleached and cleaned wherever possible by a collector or bookseller. He could not get at every place between the lines, but the cyclotron proton milliprobe could with its beam and aiming devices.

We were surprised and pleased to find that early handmade papers were so rich in chemical variation and distinctiveness from era to era and place to place. This fact greatly enhances the possibilities of applying the proton milliprobe to the study of the history of the book since its results can be combined with the substantial amount of study that has gone into the history and distinguishing physical characteristics of paper by Dard Hunter, Allan Stevenson, Eva Ziesche, Dierk Schnitger, Theo Gerardy, and Paul Needham.19

The chemical profile of paper comes from the fibers from which it is constituted, the fluid (water, and whatever minerals might be in solution in it) in which rags or other papermaking materials are prepared and in which the macerated fibers of the stuff in the papermaker's vat are suspended, and also from the chemically complicated sizings that are used to finish papers. Accidental stains, smudges, or infusions, as well as intentional treatments with preservatives and cleaners leave chemical traces that must also be taken into account.

Experiments at Davis have proved that papers of all kinds, and in some cases even individual sheets of handmade paper, have unique chemical "fingerprints" detectable by the very subtle proton milliprobe analysis. It is possible to differentiate chemically among papers with different watermarks that were produced in different mills. In some instances papers of the same watermark, and made in the same mill, vary
chemically from batch to batch or vat to vat, even though, as in the manufacture of inks, the general recipe or technique of making and mixing the stuff in the vats was the same. The ramifications of these facts are quite far-reaching for studies in the history of the book. The ability chemically to match up individual leaves of a book and to deal with questions of conjugacy, cancellation, forgery, and the physical construction of a book can be used effectively in conjunction with such well-tested methods as inspecting various watermarks in their differing states.

One of our earliest experiments made us aware that the proton milliprobe technique of analysis was more subtle than had been anticipated. A sequence of thirty-two leaves of Claude Savary’s *Lettres sur l’Egypte*, Paris, 1786, vol. I, was analyzed. Cahill at the time had no idea of how books were put together; yet when he made a preliminary glance at the data from the tests of these thirty-two successive leaves he noted immediately from the PIXE chemical evidence alone that Savary’s volume must somehow have been divided into eight-leaf segments. In short, he was seeing eight-leaf quires, as this author was able to inform him after an examination of the signature markings. Each quire was the product of the folding of a single, chemically homogeneous sheet. Figure 5 shows that each of these sheets was chemically distinguishable from the other, especially in their potassium, manganese, copper, and iron content. These sheets all bear the same watermark, but the watermarks are so fragmented within each signature because of the way the quires were folded and cut that it is impossible for us to determine whether they might be different states of the same watermark.

Analysis of a sequence of leaves in volume four of Diderot’s *Encyclopédie* confirmed that one could distinguish between individual sheets of paper with the same watermark. In the *Encyclopédie* the folio quires are bound in fours so that the outer two leaves are of the same sheet, and the inner two leaves are a fold of a single sheet. The analysis showed that conjugate leaves 1.4 of a quire were closely related chemically, and leaves 2.3 also showed a close chemical affinity to one another. Usually it is quite easy to distinguish between one sheet and another because of the differences that show up in their manganese and iron content. Table 1 shows that for these metals the first and last conjugate leaves of the same folded sheets match, as do the second and third. The sheets may have come from different vats which had slightly different mixtures of stuff, or they may have been produced after an elapse of time in the same shop. It is even possible that each separate leaf that was dipped out on the mould had a slight but measurable chemical difference from the other sheets made from the same vat of stuff. This cannot
be demonstrated however. The general chemical mix of the stuff is much the same for all the leaves of the *Encyclopédie* tested, and it is known from the publishers' records that have survived that the same papermaker supplied the sheets for the manufacture of the work over the years.
TABLE 1
PAPER ANALYSES OF QUIRES IN VOL. IV OF DIDEROT'S *Encyclopédie*, SHOWING CONJUGATE SHEETS AND CANCELS

<table>
<thead>
<tr>
<th>Vol. IV Quire/Leaf</th>
<th>Manganese (ng/cm²)</th>
<th>Iron (ng/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 1</td>
<td>0.39 ± 0.10</td>
<td>1.32 ± 0.17</td>
</tr>
<tr>
<td>C 2, cancel</td>
<td>0.50 ± 0.11</td>
<td>1.51 ± 0.18</td>
</tr>
<tr>
<td>3</td>
<td>0.27 ± 0.09</td>
<td>0.89 ± 0.13</td>
</tr>
<tr>
<td>4</td>
<td>0.46 ± 0.12</td>
<td>1.23 ± 0.16</td>
</tr>
<tr>
<td>F 1</td>
<td>0.34 ± 0.07</td>
<td>0.80 ± 0.10</td>
</tr>
<tr>
<td>F 2</td>
<td>0.32 ± 0.07</td>
<td>1.10 ± 0.13</td>
</tr>
<tr>
<td>3</td>
<td>0.30 ± 0.07</td>
<td>1.14 ± 0.11</td>
</tr>
<tr>
<td>4</td>
<td>0.28 ± 0.06</td>
<td>0.69 ± 0.09</td>
</tr>
<tr>
<td>F 1</td>
<td>0.20 ± 0.05</td>
<td>0.78 ± 0.10</td>
</tr>
<tr>
<td>F 2</td>
<td>0.31 ± 0.06</td>
<td>0.86 ± 0.10</td>
</tr>
<tr>
<td>3</td>
<td>0.30 ± 0.06</td>
<td>0.96 ± 0.12</td>
</tr>
<tr>
<td>4</td>
<td>0.18 ± 0.05</td>
<td>0.67 ± 0.09</td>
</tr>
<tr>
<td>G 1</td>
<td>0.16 ± 0.05</td>
<td>0.98 ± 0.12</td>
</tr>
<tr>
<td>G 2</td>
<td>0.28 ± 0.05</td>
<td>0.45 ± 0.06</td>
</tr>
<tr>
<td>3</td>
<td>0.33 ± 0.06</td>
<td>0.57 ± 0.07</td>
</tr>
<tr>
<td>4</td>
<td>0.19 ± 0.05</td>
<td>0.71 ± 0.09</td>
</tr>
<tr>
<td>H 1</td>
<td>0.11 ± 0.10</td>
<td>1.27 ± 0.17</td>
</tr>
<tr>
<td>H 2</td>
<td>0.23 ± 0.03</td>
<td>0.83 ± 0.11</td>
</tr>
<tr>
<td>3</td>
<td>0.18 ± 0.06</td>
<td>0.72 ± 0.10</td>
</tr>
<tr>
<td>4, cancel</td>
<td>0.13 ± 0.05</td>
<td>0.42 ± 0.06</td>
</tr>
</tbody>
</table>

Note: The brackets connect the conjugate leaves of the same sheet. C2 and H2 are cancels, which is seen in the lack of homogeneity of their Manganese and Iron content.

It was interesting to observe that the chemistry of a leaf from a contemporary Italian counterfeit of the *Encyclopédie* was distinctively different from that of all the leaves tested in the original edition. What caused this difference is not clear. The Italian paper may have had a different sizing, its fibers may have been prepared through a different process and treated with water from a river with different minerals in it; but the critical point is that the paper was so different chemically that we could have detected it was a counterfeit even without knowing from other evidence that it was.

It is also possible to detect the presence of cancel leaves through the proton milliprobe technique, as can be seen from table 1, which includes the manganese and iron values for two known cancels in Diderot's *Encyclopédie*—leaf two in quire C and leaf four in quire H, both of which are strikingly different from the leaves in the quire that would have been their conjugates.

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Finally, we have been able to distinguish chemically among the four paper sorts of the Gutenberg Bible—the Bulls Head, the thin-stemmed Grape Cluster (Grape I), the thick-stemmed Grape Cluster (Grape II), and the Ox. Figures 6 and 7 show that the manganese and iron content is the best means of distinguishing one Gutenberg paper sort from the other. It is thus possible to tell to which paper sort a half sheet that lacks the watermark belongs. Whether chemical differences can be distinguished among the various states of the Bull's Head paper identified by Paul Needham is still under study.

In summary, the proton milliprobe is of considerable use in historical study and analytical bibliography for works printed, written, engraved, or painted on paper. It will yield information on conjugacy, cancels, possible censoring, replacement of lost leaves, patching, and counterfeiting of leaves or of whole books. And it can be directed toward other questions that are helpful in the historical study of books and manuscripts. For instance, with this method the effect of infusions of foreign substances on the pages from glues and treatments of the bindings, environmental effects, and the impact of cosmetic operations can be measured.

Analysis of Other Aspects of Early Books and Manuscripts: Parchments, Rubrication, Illuminations, Decorations, and Stains

Different types of parchments have detectable distinctions, and the differing technologies of preparing parchment at various times have left their chemical marks. Preliminary experiments show distinguishable variations in parchments from different times and places, but, as noted earlier, there is less consistency in individual sheets than in papers. Yet helpful patterns are discernible. A large-scale project of analysis of parchments is projected now at our laboratory with the intention of establishing a database on parchments from antiquity to modern times.

The materials in rubrications, illuminations, decorations, and stains are easily detectable with the proton beam method, and most of the capabilities listed for the analysis of inks are applicable to pigmented sections of early books. It is easy to detect pigments used for recent restorations and to expose forged illuminations in which the forger used pigments not available in the appropriate period. Again, the beginnings have been made in our laboratory in the long process of building up a database on the chemistry of pigments in rubrications and
Figure 6. (a) Distribution of Fe/Ca for Papers of Three Watermarks. (b) Distribution of Mn/Ca for Papers of Three Watermarks.
Figure 7. Composition of Papers Seen in the 42-line Bible Relative to Calcium.
illuminations. These analyses are supplemented by the growing literature already in existence on this subject, developed through other historical means by art historians.

Conclusion

The proton milliprobe PIXE technique has such a wide range of potential applications that this group could never hope to carry through more than a fraction of the investigations that are possible, even in a single field such as the testing of incunabula. We welcome signs that the use of the technique will be taken up elsewhere. For instance, the Louvre Museum will soon have its own proton milliprobe laboratory in operation using a van de Graaf accelerator. We have been in close communication with Christian Lahanier, the head of the Louvre Conservation Laboratory, who has made two visits to our laboratory—one of a week’s duration—to consult with us and to test certain capabilities of the system used at Crocker Nuclear Laboratory in Davis. His laboratory will launch a program of proton milliprobe analyses of a large variety of materials in works at the Louvre and other museums in France. We look forward to collaborating with the Louvre group, the Bibliothèque Nationale, and other collections in the investigation of some important incunabula in France, such as the Gutenberg Bibles, the thirty-six line Bible, and several other treasures of the earliest history of printing. We have been in communication also with Hans Mommsen of the Institut für Kern- und Strahlenphysik at Bonn, who has already done some PIXE analyses of archaeological artifacts, and we anticipate that historians working with his group will be doing more and more investigations related to ours in the history of the book.

There are a number of nuclear laboratories throughout the world that have the capabilities of establishing proton milliprobe programs such as ours. The establishment of facilities to do this kind of analysis in conservation laboratories of large museums and galleries is not out of the question, since far smaller accelerators than ours can be used to produce the proton beams. Therefore, we have confidence that the use of this technique will continue to spread as its value becomes better and better known.

ACKNOWLEDGMENT

I should like to acknowledge that while carrying out much of the research reported here, I received support from the Guggenheim Foun-
History of the Book and the Proton Milliprobe

dation and research grants from the University of California at Davis. I am particularly indebted, as always, to Adrian Wilson and Joyce Wilson for their enthusiastic support and scholarly advice. They have participated in our Gutenberg and incunabula projects in a vital way from the outset.

References


2. Our group has experimentally applied it to bronzes and other metallic objects, textiles, fragments of ancient marble artifacts, obsidian tools, remains from archaeological digs, engravings and woodcuts, painted works, and postage stamps.


6. The publications of Thomas A. Cahill and his collaborators about this technique and the laboratory results of its application are far too numerous to list here. Cahill’s “Proton Microprobes and Particle-Induced X-Ray Analytical Systems.” Annual Review of Nuclear Particle Science 30(1980):211-52, is an excellent survey of the subject.

7. The lectern is not necessary at all for the testing of a single unbound leaf or fragment, which can be laid on the target plate and held by the investigator.


9. This could be of help in determining what revisions an author may have made in a manuscript work, perhaps years after composing the first draft, revisions put in with an ink of a different chemistry from that of the original ink.

14. The *Sibyllenbuch* fragment, brought to our laboratory by Dr. Hans Halbey of the Gutenberg Museum in Mainz, is regarded as the earliest extant specimen of printing with movable metal types.
15. See Kushner’s contribution to Cox’s *The Calvob Bible of J.S. Bach*.
17. See our article “The Vinland Map Revisited: New Compositional Evidence on Its Inks and Parchment.” Analytical Chemistry 59(no. 6, 1987) and our “Further Elemental Analyses of the Vinland Map, the Tartar Relation, and the Speculum Historiale.” Report to Yale University, Beinecke Rare Book and Manuscript Library, 1985, which is a complete survey of our data and conclusions in 75 pages.
18. In 1985, we tested the inks of six fragments of the Dead Sea Scrolls brought here from the Shrine of the Book in Jerusalem by Magen Broshi. We are still in the process of evaluating the interesting chemical information derived from those analyses, although we can point out that the inks on most of the fragments were purely carbon inks, while two of the fragments contained a copper compound. Further testing may be needed to build up a context in which historical meaning of our data on these fragments can be fully evaluated.
20. The few preliminary tests we have made of Egyptian papyrus fragments showed they had very complex detectable composition. Thus, we are confident that the analysis of papyri may well become an important field for proton milliprobe historical investigation.
21. It should be evident from our description of all the nondestructive capabilities of the proton milliprobe that it can have a very wide range of applications in the burgeoning areas of conservation and restoration of books and manuscripts, as well as other important historical artifacts and art pieces. Every kind of analysis reviewed here can of course be turned to problems of conservation and restoration, both in rare book libraries and museums. For several years we have been exchanging visits with the head of the J. Paul Getty Conservation Laboratory and have begun, in a small way, some cooperative research with that group. Thus, through our relationship with the Louvre and J. Paul Getty Laboratories we have seen the beginnings of the use of the proton milliprobe for what may soon become a significant element in the art and science of conservation and museology.
The Analysis of Paper and Ink in Early Maps

DAVID WOODWARD

Within the last twenty years, several promising new means of analyzing the physical and chemical structure of historical artifacts have been introduced. So rapid have been the development and so wide the choice of available techniques that their comparative value has become unclear especially to practitioners in fields where analytical techniques have only recently been introduced. The aim of this article is to compare some of the opportunities available and to pose some questions concerning their value for the analysis of early maps.

The logical analysis of physical form in printed books and manuscripts without the use of electronic aids has a much longer, if sporadic, history. In analytical bibliography, for example, the study of the Thomas Wise forgeries by Carter and Pollard in 1934 was one of the earliest attempts at using detailed physical evidence of paper and typography to demonstrate conclusively the falsity of documents. Their conclusions were elegant in their logic and simplicity and provided a methodological example of the value of careful and systematic physical observation, a viewpoint that had previously been neglected or even overlooked in favor of the document's content. In the history of cartography, this approach has already been summarized elsewhere by the author. The recent addition of such techniques as beta radiography, external beam particle-induced X-ray emission (PIXE), and energy dispersive X-ray fluorescence (XRF) has provided new opportunities for the analysis of both manuscript and printed maps which the historian of cartography should consider.

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Opportunities

What are the physical components of a map that can be analyzed systematically? Simply expressed, they are the fabric (paper, vellum etc.) and medium (ink, paint, etc.). Some techniques—such as beta radiography—are only applicable to paper analysis, while others—such as PIXE or XRF—may be applied to both the fabric and the medium.

Paper

The dating of paper used for maps starts in earnest with the work of Edward Heawood who combined a knowledge of paper history with the history of cartography and who used maps as examples for his volume in the series of watermark albums published by the Paper Publications Society. Heawood's interest in this evidence is also seen in a series of articles on maps printed in Italy in the sixteenth century. On account of the complicated plate histories of most of these maps with plates changing ownership several times during their lifespan, he demonstrated that the paper evidence could be especially valuable.

Heawood's interest in watermarks and in sixteenth-century Italian printed maps was continued by the scholar-collector George H. Beans, who between 1957 and 1962 presented most of his map collection to the John Carter Brown Library. In addition to his collecting, Beans published his own and others' work in Jenkintown, Pennsylvania in a series of publications under the imprint of the George H. Beans Library including a small handlist of watermark tracings found on sixteenth-century Italian maps. He also contributed to Imago Mundi on topics of his collecting interest under the title Notes from the Tall Tree Library. Building on these studies of Heawood and Beans, since 1977 the present author has developed several lines of research on the dating of sixteenth-century Italian maps using several analytical methods.

Comparative watermark analysis was severely hindered by the lack of an objective method of reproducing and recording the marks, a drawback that has now been largely solved by several imaging methods. The fastest and most economical of these is direct contact photography—known as the Ilkley method—in which high speed graphic arts film is laid under the map, glass laid on top of it, and the whole sandwich exposed to a 15-watt light bulb about eighteen inches away for approximately one second. Another method using ultraviolet radiation with special (Dylux) paper has the advantage that a darkroom is not needed. One drawback of both these methods is that the image includes the map detail, which often seriously obscures the watermark. For this
Analysis of Paper and Ink

reason beta radiography has gained increasing acceptance. The hand tracing of watermarks—while suitable for general studies and certainly preferable to omitting the image altogether in a description—is now considered much less desirable than the objective methods.

In 1967, The Newberry Library in Chicago acquired part of the collection of Franco Novacco, which included approximately 330 sixteenth-century printed Italian maps. Between 1978 and 1980 the author acquired about 900 beta radiograph images of watermarks from these and other sixteenth-century Italian printed maps loaned to the library from other institutions and private collections. In addition, a set of watermark images was obtained from a sixteenth-century Italian atlas sold at Sotheby Parke-Bernet on 15 April 1980 to a private collection in England (its whereabouts are now unknown). Before the sale, the author cataloged a portion of the atlas in detail and photographed about 110 watermarks using the Ilkley process.

The atlas consists of a core of sixteenth-century maps inlaid in extended margins or marginal strips. The watermark evidence is crucial to establishing the date and place of assemblage which was concluded to be Venice ca. 1570. The key marks, illustrated in figure 1, are the siren-in-circle and horse-in-circle which are found respectively on the two sheets of the map of the world on a cordiform projection by Giovanni Paolo Cimerlino engraved in 1566. The siren watermark can be confidently identified as of Venetian origin, and its association with the horse mark on the Cimerlino map would suggest that the horse is also Venetian. This is the only map in the atlas in which the horse mark appears, but it occurs in the marginal strips with great frequency. One can therefore assume that the core of the atlas was assembled with the extended margins in a Venetian shop, probably in 1570, the date of the last map that has such margins.

Further research projects at the University of Wisconsin have focused on all watermarks of one design from the entire collection of images—a siren (or mermaid with two tails) in a circle surmounted by a star. Forty-eight watermarks representing thirty-seven maps were selected (some maps consisted of two or more sheets pasted together). Sixteen images were obtained from The Newberry Library, Chicago; seven from Helsinki University Library; one from California State University, Fullerton; and twenty-four from private collections in California and London. Forty-three of the images were beta radiographs; the remaining were negatives made with the Ilkley process.

These forty-eight images were compared visually and found to fall into two distinct groups characterized by a difference in the shape of the
Analysis of Paper and Ink

Figure 1b
mermaid's right shoulder. In the Martha-type watermark, the right shoulder was broader than the left. The other image was called Mary. Out of 1000 images taken randomly from several collections worldwide, only two paper moulds of this design were represented. This surprising find indicated the likelihood that these two watermarks were from twin moulds and therefore most probably were always used in tandem in the papermaking process. This of course is not unusual in the making of handmade paper, but it does suggest that no other moulds bearing this emblem were used to make paper on which maps were printed, which was not expected.

Furthermore, five out of six sets of watermarks on the two-sheet maps turned out to be from the paired moulds, suggesting that, in a two-sheet map, there was a strong likelihood of printing the sheets one after the other rather than running off several copies of one sheet and then several copies of the other. This conclusion results from the likelihood that the sheets in a batch of paper (with inevitable exceptions) would normally remain approximately in the order that they were made, which would follow an alternating pattern using the two different moulds in tandem.

For the maps bearing an engraved date, the range of the plates was 1559-1570. The frequency of the dating is shown in figure 2, and it can be seen that the frequency increases toward the latter part of the period. None was found dated after 1570. Beans gave a range of 1561-1570 but also found none after 1570. Something happened to this pair of moulds in 1570, and the search is on for maps with such a mark bearing a publication date of 1571 or after. However, on the basis of the large sample already gathered, it is unlikely that such maps will be found. Although a small sample is illustrated in figure 2, it is possible to infer that the marks were current during the latter part of the period only (that is, from 1566 to 1570), and that earlier dated maps were simply printed from the earlier plates during those years.

The question arises: How do we know if the difference between two watermarks is due to two states of the same mould or two different moulds? Fortunately, a technical detail in the manufacture of the mould comes to our aid. The watermark was usually attached to the mould with thin sewing wires which show up as light dots on the radiograph. Even if the shape of the mark should become distorted with use, therefore, the two patterns of the sewing dots will remain the same (see fig. 3). On the other hand, the likelihood of two marks on different paper moulds having the same pattern of sewing dots is slim indeed. In some cases, it is true, a sewing dot might be added to secure the watermark on
Analysis of Paper and Ink

Number of dated maps

<table>
<thead>
<tr>
<th>Imprint date</th>
<th>Number of maps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1559</td>
<td>1</td>
</tr>
<tr>
<td>1560</td>
<td>1</td>
</tr>
<tr>
<td>1561</td>
<td>2</td>
</tr>
<tr>
<td>1562</td>
<td>1</td>
</tr>
<tr>
<td>1563</td>
<td>1</td>
</tr>
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<tr>
<td>1569</td>
<td>2</td>
</tr>
<tr>
<td>1570</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 2
the mould, but this can usually be identified and thus will aid and not hinder the ordering of the states of the mould.

A confident identification of the paper moulds in this experiment could not have been made before the techniques of watermark photography and radiography had been developed. But the possibilities for analysis do not end with mere identification. Stevenson has shown that paper moulds may go through identifiable stages during their existence analogous to the states of a printing plate. The mark may become increasingly distorted with use as the mould is jostled or as excess pulp is brushed from it. More dramatically, if the mark is situated between chain lines and not sewn to a chain line passing through it, the sewing wires tend to become loose with age and the mark moves slowly to the left in relation to the chain lines (see fig. 4). Stevenson even estimated the rate of movement as averaging about a millimeter a month, a distance certainly discernible on a radiograph.\(^{13}\)

This theory is promising, but there are practical difficulties. The sewing dots are not always perfectly distinguishable even on the radiograph. Further, since each image had to be compared with every other image in this analysis to discern minute differences, the number of combinations exceeds 900. With this in mind, it was decided to take thirty-nine of the forty-eight images (those already in film form) to the University of Wisconsin's Center for Remote Sensing which recently acquired equipment for the analysis of satellite imagery, particularly Landsat.\(^{14}\) These images were converted to numerical form on a scanning microdensitometer which records the film density of the radiograph at each of 350,000 small squares, here shown at normal size and enlarged eight times (see figs. 5 and 6). For each square or picture element three pieces of information were stored on tape or disk—the x and y coordinates of the picture element and the recorded density.\(^{15}\)

Once the images are in digital form, they can be manipulated statistically in several ways. The range of density can be standardized from image to image by stretching the contrast between a given low and high figure. Further, the contrast of the images may be enhanced to bring out the pattern of sewing dots. If two images of watermarks from the same mould are superimposed on an image processor, these dots will become more prominent. If they are from different moulds, this will also become immediately apparent.

The analysis of successive states of a watermark using beta radiography can most easily be achieved when the mark is not wired to a central chain line (thus allowing it to slide along the wire lines during its lifetime). This was the basis of Stevenson's study. But for watermarks
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Figure 3

Wire line or laid line (over entire mould)  
Sewing dots  
Watermark  
Chain lines
Twins = Shape similar;
Pattern of sewing dots different

States = Shape different;
Pattern of sewing dots similar

Figure 4
that are tied to a central chain line—such as in the case of the vast majority of sixteenth-century Italian watermarks—analysis of such movement is not feasible since the variation of the position of the mark between the chain lines is usually not great enough to be measured.

Nevertheless, the stresses placed on the paper mould during its life sometimes cause the shape of the watermark to change subtly, and a continuation of the study using the thirty-nine siren watermarks has shown that minute changes in the shape of a mark can also be recognized using a combination of precise measurement and statistical analysis. The coordinates of twelve control points were chosen on each of the thirty-nine watermarks from the digital image displayed on the image processor, normalized using an affine transformation, and the root mean square (RMS) error was computed that measured how well one set of control points fitted another. These were tabulated in a matrix so that the fit of every watermark on every other watermark within the same mould could be readily seen. (It was found earlier that the RMS values could readily distinguish between two marks from different paper moulds; these values were much higher than for those from the same mould.)

The radiographs of the best and worst fit cases were then carefully examined to establish where the extreme differences lay. In the case of the Martha mould, the extremely subtle difference was seen in the degree of roundness of the left (as we see it) shoulder (see fig. 7). The same is true of the Mary mould, but the angle of the “V” between the fin and right shoulder changes very slightly (see fig. 8). It is hypothesized that, over the life of a mould, such curved wires subject to horizontal pressure in the brushing off of excess pulp from the mould at the end of the day would become increasingly angular.

Correspondingly, we would expect the most curved examples to be the earlier states of the mould. No map on either Martha or Mary paper has yet been found bearing a date after 1570, so we may postulate this as being the end of the mould’s life. Of the dated maps bearing the Martha watermark, 1559 is the earliest yet the state of this mark is similar to that of a map dated 1569. If we accept Stevenson’s view that paper stocks of normal sizes were used up quite quickly, say within one year, it would therefore seem likely that the life of the Martha (and thus probably also the Mary) mould might reasonably be postulated to be between 1568 and 1570 or perhaps even 1569-1570. This conforms with the evidence presented earlier that toward the end of the decade we see a marked increase in the number of dated maps bearing marks from the Martha and Mary moulds thus considerably narrowing the range given by Beans (1561-1570) and providing a more precise tool than was previously thought.
Figure 5
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Figure 6
In addition, the author’s experiments have shown that the digital scanning of watermarks has certain key advantages. Once the image is scanned, the entire image or sections of it can be manipulated and compared more easily with other similar images. Furthermore, should data banks of watermark images eventually be compiled to replace and enlarge on the manuals of hand-drawn tracings, the digital form of the data may become desirable. With the recent improvements in microcomputers it is now likely that scanned images of lower resolution stored on hard disks will be adequate to perform the analysis.

Beta radiography, however, has now been joined by techniques that measure the percentages of elements in paper. For example, Particle-Induced X-ray Emission has now been used successfully in archaeological and bibliographical work as well as in its more usual biological and chemical applications. A beam of protons is accelerated in a cyclotron, deflected into a vacuum pipe, and narrowed down to a precise beam that can be made less than a millimeter square and aimed at the document in question. In order to avoid placing the document in a vacuum, the beam is passed into a helium or air chamber into which the document is introduced. This improvement, known as “external beam,” is essential for the handling of large awkward shaped or precious artifacts including maps and atlases. When aimed at a section of a document—either at the paper, vellum, ink, or pigment—the clashing of particles in the beam with the atoms of the various elements in the object being analyzed excites the atoms in such a way as to generate characteristic X rays which shoot out in all directions. A sample of these is read and the characteristic X rays of each element present in the section of document under analysis are counted, processed by computer, and recorded. In order to avoid bias due to different thicknesses of the material analyzed, the occurrence of an element is expressed as a ratio to calcium, which is a common element in paper of any age.

Each sheet of paper seems to have its unique chemical profile, and the technique is so sensitive that in a study of an eighteenth-century octavo French travel book by a team at the University of California, Davis, the signatures were revealed as groups of eight relatively homogeneous leaves. The sensitivity of this technique was underlined when it is realized that the physicist who drew attention to the periodicity was not previously aware of the occurrence of signatures in printed books.

In a more recent study reported by Eldred, 324 leaves from the first volume of a Gutenberg Bible from St. John’s Seminary, Camarillo, California, were analyzed using the UC Davis cyclotron. Calcium again was found to be the most abundant element with smaller amounts of silicon, phosphorus, potassium, sulfur, iron, manganese, copper, and
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zinc. Three watermarks were found (named a, b, and c) with similar chemical composition in the paper bearing each: b was found to have twice the iron of a or c and twice the manganese of a, while c was found to have twice the manganese of a but a similar amount of iron to b. It was thus possible to determine the category of an unwatermarked page from the chemical analysis alone.19

The implications of this technique for the study of map paper are several; for the purpose here, examples in the study of sixteenth-century Italian printed maps have been chosen. For these maps, many of which have been extracted from composite atlases with marginal strips pasted to their borders, the technique could easily be used for reconstructing the original content of these atlases by grouping marginal strips of similar chemical composition. In addition, the PIXE data could be used to answer a series of questions about the chemical variation of papers with the same watermark, its twin, or its variant of the same design. Papers bearing the same watermark from several different document types, such as printed books or prints, could also be analyzed. Perhaps most importantly, papers of similar chemical content with different watermarks might be searched for, establishing the association of multiple watermark designs using a common papermaker’s vat at a given time. Finally, were enough data gathered, what Schwab has called a “systematic chemical-bibliographical grid” could be compiled for a given period into which samples of unknown origin could be placed.20

The main problem with the analysis of paper is that it dates the paper and not the impression. While Stevenson attempted to allay fears about this, the skepticism remains. With enough data on the chemical composition of the paper, however, along with analysis of the other physical component of the document—the ink—both interpreted within their general publishing context, it might indeed be possible to arrive at a good estimate for the average shelf life of a sheet of paper between paper mould and printing press and thus an indication of the precision by which impressions may be dated from an analysis of the paper which carries them.

Ink

Unlike the analysis of paper, the analysis of printing ink on maps provides information about the circumstances of the impression and printing rather than the papermaking and is thus a more directly useful form of evidence. Yet if the history of paper is an obscure area of study, the study of printing ink as a historical source of evidence is far more obscure, largely because the methods of analyzing it have not been
Figure 7
Analysis of Paper and Ink

Figure 8
available until very recently. One reason given for the delay in studying the Vinland Map inks in the late 1960s, for example, was that improvements in microspectroscopy had to be awaited before the analysis could be completed. The more recent PIXE or XRF techniques have now radically changed the situation.

The series of studies recently carried out using PIXE at the University of California, Davis, with various copies of the forty-two line Gutenberg Bible, thirty-six line Bible, and other documents reveal an astonishing sensitivity of the technique in analyzing printing ink composition. The analysis revealed details of the day-to-day organization of the printing of the first volume of the forty-two line Bible with such precision that the number of production crews—six—could be concluded as well as the times when the work was shifted around to keep them busy. A technique capable of providing conclusions of such minute technical detail could clearly add an important dimension to the physical analysis of maps. The Vinland Map, for example, could now be subjected to the proton beam without fear of damage. The examination of the map in 1974 by McCrone Associates in Chicago had revealed substantial amounts of a particular precipitated form of titanium dioxide that was only commercially available in the twentieth century. The cyclotron at the University of California, Davis, however, revealed titanium dioxide in only trace amounts, once again opening the question of the map's authenticity.

The technique has obvious applications in the study of sixteenth-century Italian printed maps. For example, key ratios of the composition of ink could be plotted against key ratios of paper composition, and the resulting clusters would indicate which certain combinations were active. Should these clusters also be related to the printing of certain map plates or particular centers of the map trade (for example, Venice); further conclusions could be drawn. Composite atlases suspected of being partially printed at once (such as a Venetian atlas in The Newberry Library previously described by the author) could be analyzed with this method to confirm this idea. Furthermore, by calibrating the watermark data with the proton analysis, a clearer estimate of the reliability of watermark evidence in dating could be achieved.

Competing with the PIXE technique is energy dispersive X-ray fluorescence which has been in wide use in analytical chemistry since about 1950, and which has been in use for the study of archaeological and fine arts objects for several years. Both wavelength and energy dispersive systems have been used, but only the latter may be nondestructive. In the energy dispersive system, an X-ray beam is focused on a thin surface layer of the sample which fluoresces in all directions.
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producing electrical pulses whose magnitude is unique to each element present in the sample. A detector close to the source senses some of these pulses, which are counted and processed (usually by a microcomputer) to provide proportions of elements above sodium (atomic number 11). Some units have different ranges depending on whether the sample is placed in air or helium.

At the Winterthur Museum in Wilmington, Delaware, studies of paper and graphic objects have been carried out with success since 1973, enabling the staff to obtain recognizable spectral patterns for papers from specific paper mills made over several decades. The technique is even valuable for nineteenth-century artifacts—by detecting the presence of zinc or copper uniformly distributed over a lithographic print, the composition of the printing plate can be deduced. Lithographs free of zinc or copper are thus assumed to have been printed from stone thus predating the lithographic transfers from metallic plates. This application for the recognition of the states of late nineteenth-century lithographic maps is clearly promising.27

More recently, Gary Carriveau of the Detroit Institute of Arts has used XRF for an analysis of the pigments on several Rembrandt drawings finding that a recent unrecorded restoration on one had been carried out using a pigment containing titanium dioxide.28 The Detroit XRF equipment was also used in a study by Béla Nagy who analyzed several pigments on selected European maps from the fifteenth to the nineteenth centuries, clearly demonstrating the value of the technique for detecting modern color. For example, on a 1681 map of Lombardy by Cantelli da Vignola, a number of nineteenth- and twentieth-century pigments were found, namely zinc white, titanium white, and barium white.29

Equally as important as the availability of the equipment are the concerns of curators and librarians in protecting artifacts from irreversible damage. According to Cahill, no technique other than external beam PIXE and XRF seems to fulfill this essential requirement.30 Chemical or electron beam methods which have necessitated destroying samples of the artifact, however small (such as the X-ray diffraction and electron microscopy used for the Vinland Map) would now appear to be less desirable.

Another group of factors includes the technical requirements of the analysis such as target area size, system sensitivity, errors caused by unevenness in the sample's surface, and range of elements detectable. PIXE can detect, in principle, all elements between sodium and uranium in a single irradiation. Depending on the unit, XRF can only detect about thirty of these elements above chlorine (atomic number 17),
although recent models with the sample placed in helium can detect above sodium. The accuracy of PIXE (±5 or ±2 percent for thin targets) also exceeds that of XRF in equivalent irradiation time. The unevenness of the sample’s surface has an effect on accuracy in both XRF and in PIXE. We must await further experience with the analysis of historical papers and inks to determine the level of sensitivity required, although Hanson reports that XRF provides data well within the needs of the Winterthur staff for the purpose of detecting forgeries in general museum artifacts. The main advantage of PIXE over XRF at present seems to be in the size of the target analyzed at equivalent times of irradiation. PIXE can focus to 1mm in an exposure of thirty seconds, but this would take much longer for XRF. Exposure time was about 5 minutes for a 5mm diameter target area in the Nagy study, but in order for this to be focused to 1mm, the irradiation time would have to be about 125 minutes. The sensitivity desired must therefore be weighed against the time and expense of the analysis. Since the composition of the sample is averaged over the target area, more sensitive readings will result from a smaller target area. In maps analysis, this is a prime consideration as the ink is frequently found only on very thin lines. Pigments may also be found confined in small areas. For a general analysis of large paper or pigment areas, however, XRF may be adequate for the research at hand. The sensitivity and viewing area of the XRF technique is, however, rapidly improving, and it might well provide a valuable alternative to the PIXE technique, particularly for cases where larger areas can be sampled or the precision requirements are not as stringent.

If external beam PIXE can identify a batch or even a sheet of paper with a unique chemical fingerprint, to say nothing of the ink, what future is there for watermark analysis? On the surface it might appear that all current projects for compiling albums of watermark images should be discontinued in favor of systematic PIXE or XRF analysis of whole groups of documents from various periods and origins. But it is equally desirable to compile files of watermark images preferably using prints from beta radiography negatives reproduced at full-size. The reason is that for many purposes (such as the determination of forgeries) a dating precision of only a few years may be necessary. In addition, for the analysis of an occasional suspect document, a quick beta radiograph or other watermark image is more feasible than an individual analysis by XRF or PIXE, even if the latter were available locally. Furthermore, the systematic collection of watermark images flags those documents that are suitable candidates for PIXE or XRF analysis. For example, a PIXE analysis of all thirty-nine of the sixteenth-century
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Italian siren watermarks in the author's recent work, together with additional similar marks gathered from books and prints, would demonstrate the variation in composition of the batches created with this particular pair of watermarks. This might demonstrate that only a sample of papers of a given watermark might need PIXE analysis. Should the ink in maps, books, and prints of particular printers be found to correlate with batches of paper bearing such watermarks, further confirmation might also be found of the author's narrowing of the date of appearance of maps appearing on this paper to 1568-70.

The main limiting factor of all scientific methods of analysis at present is that a sufficient fund of characteristic data has yet to be built up. The information relating to the chemical content of paper or ink means little in isolation; it needs to be related to the norms for a particular period, printer, or papermaker. Considerable institutional cooperation will be necessary if this information is to be gathered systematically and in a consistent format. If beta radiograph images were stored digitally, for example, they would be accessible by telecommunications. Statistical data relating to the content of paper, ink, and pigment should also be made available in digital form. Despite the apparent immensity of the task, it is not too early to start to compile specifications for such a data bank, which, if coordinated by a major library or institution, would constitute an impressive resource not only for historians of cartography but also for all researchers, conservators, archivists, librarians, and others who need access to precise physical information about the documents that come into their hands.

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References


3. While they are not strictly physical components, the marks themselves (ink lines, patches of color) have physical characteristics that can be measured to provide clues to the origin or dating of documents. For example, microphotography of the impressions has been used to order states of Hogarth prints, and enhancement of writing on manuscripts has been carried out by Benton, et al. See Benton, John F., et al. "Digital Image-Processing Applied to the Photography of Manuscripts." Scriptorium 19(1979):40-55. Additional physical components might include adventitious matter such as dirt, stains, etc., some of which may reveal the history of a particular document. Arthur Baynes-Cope has summarized the physical components of documents in "The Scientific Examination of the Vinland Map at the Research Laboratory of the British Museum." Geographical Journal 140(June 1974):208-11. Additional terms for these components (none of which has yet entirely been accepted in the literature) are discussed in Woodward, "The Form of Maps."


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14. The assistance of Frank Scarpace, Pete Weiler, and Mark Olsen is gratefully acknowledged.

15. Scanning was performed on an Optronics Photomation System P-1700 scanning microdensitometer with a resolution of 500 x 700 picture elements. The images were processed on a Stanford 170 Digital Image Processor.


30. Cahill, "Proton Microprobes and Particle-Induced X-ray Analytical Systems."

31. Hanson, "Determination of Trace Elements," p. 145.
STANDARDS WORK AT ITS EASIEST is never very easy. In the fields of automation and bibliographic control of special collections it is perhaps more difficult than in other areas. To be properly consultative and authoritative, this kind of standards work must take place under the aegis of national organizations like the American Library Association. This in itself is enough to exclude the direct participation of most candidates for work in this area because, as the last few years have shown, most special collections librarians either shun ALA altogether or limit their attendance to annual Rare Book and Manuscript Section (RBMS) preconference institutes and summer rare book schools. While these seminars and workshops arguably contribute to the subject expertise and professional development of the participants—sometimes even in areas relating to automated bibliographic control—they do not necessarily contribute to the development of standards hospitable to rare book and special collections.

Perhaps it is because special collections librarians are often academic tenure-track defectors of one kind or another that they sometimes tend to value pursuit of esoteric subdisciplines more than the less exciting task of improving the accessibility of their collections to other scholars. As a result, it is generally only a dedicated few who end up doing standards work in this field. To make matters worse, those few who do commit themselves to the long and usually thankless process of standards work are frequently faced with apathetic or even unsympathetic administrators at their home institutions, with workloads that

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allow little or no time for standards activities, and with extremely long intervals between meetings—intervals long enough almost to forget what the point of it all is.

The pool of talent, energy, leadership, and institutional support for this kind of standards work seems depressingly small. The same peoples' names come up over and over, and those capable of making real contributions always seem to be involved in a myriad of other activities, most of them much more entertaining. When people are finally corralled into participating in this work, it is not infrequently the case that, when they finally meet after six months or a year, they haven't had a moment to do what they promised they would at the last meeting, and they have usually had to pay their own way to the conference.

Why it should be so difficult to carry out standards work in the area of automated control of special collections is perhaps not really so mysterious. To many people's minds rare book cataloging and library automation are both tainted with being clerical, unacademic, and perhaps even vaguely disreputable (and when you consider that librarianship itself is generally considered disreputable, those involved in computer-assisted rare book cataloging must be disreputable indeed). After all, isn't rare book cataloging where you put people who were personnel problems elsewhere in the library? And isn't automation really inimical to the true spirit of old books, even if it does help you get grant money these days?

Yet a further problem in standards work in this area is the lack of an effective institutional vehicle for it. The Library of Congress (LC) has provided some leadership in the past, most notably in the preparation of Bibliographic Description of Rare Books (1981), the manual that made it possible even to consider applying the second edition of the Anglo-American Cataloguing Rules (AACR2) to the cataloging of rare books. For most purposes, however, LC has chosen not to be a center of activity for rare book standards work.

Since 1980, the Standards Committee of the Rare Book and Manuscript Section of the Association of College and Research Libraries of ALA has attempted to coordinate standards development in the area of bibliographic control of rare books. The RBMS Standards Committee was in many ways the outgrowth of an ad hoc committee of the Independent Research Libraries Association (IRLA) which in 1979 was charged with investigating the problems of rare book cataloging and automation. This IRLA committee, chaired by Marcus A. McCorrison, librarian and director of the American Antiquarian Society, issued a final report that had several major recommendations—it supported LC's proposal to publish a cataloging manual compatible with
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AACR2, and urged that LC consult widely with the rare book community during its preparation (which it did); it proposed a number of changes to the LC MARC (Machine Readable Cataloging) format to accommodate rare book information; and it recommended that a number of thesauri be developed for specialized access points in rare book records ("special file access").

Members of the IRLA committee and those in RBMS who were following its progress soon realized the need for some more permanent vehicle to carry out these recommendations and to continue to promote bibliographic standards, as well as education and information exchange in this area. To this end the RBMS Standards Committee was established in 1979 and met for the first time in January 1980.

Since 1980, the Standards Committee has succeeded to some extent in coordinating further work on bibliographical standards for rare book and special collections. The committee has so far sponsored, produced, or worked on the following standards:

- Standard Citation Forms for Published Bibliographies and Catalogs Used in Rare Book Cataloging by Peter VanWingen and Stephen Davis. Washington, D.C.: Library of Congress, 1982.
- Genre Terms: A Thesaurus for Use in Rare Book and Special Collections Cataloguing. Chicago: Association of College and Research Libraries, ALA, 1983. (Editor's Note: This thesaurus is currently under revision. Two more thesauri have been completed: Printing and Publishing Evidence. Chicago: Association of College and Research Libraries, ALA, 1986; and Binding Terms. Chicago: Association of College and Research Libraries, ALA, 1987.)

In addition to these published standards, the standards committee completed and shepherded through ALA the IRLA MARC format proposals, all except one of which were ultimately accepted; it has sponsored programs and information exchanges, it has begun to open channels of communication with the major bibliographic utilities (OCLC and RLIN) about the needs of rare book and special collections; it has developed proposals for handling rare serials in MARC and under AACR2, which, in revised form, were adopted by the Library of Congress and published as LC rule interpretations in Cataloging Service Bulletin, No. 26, Fall 1984, pp. 21-25.

On the surface, these publications and activities might seem reasonable accomplishments for a committee that was established seven
years ago. In actuality, however, progress has been painfully slow and hampered by many of the problems mentioned earlier in this paper. Even more significantly, however, the Standards Committee has not managed to move beyond those original IRLA proposals. Much has happened in librarianship, automation, and special collections over the past seven years, and many opportunities have been missed in education, dissemination of information, standards coordination and development, and for constructive engagement in issues before RBMS and other parts of ALA. Broader discussion of directions for technical services in special collections has been notably absent from committee deliberations.

A further dilution of the effectiveness of the committee resulted from a 1984 decision by the RBMS Executive Committee to broaden the Standards Committee’s scope to include review of all kinds of nonbibliographic standards, regardless of the interest or expertise of committee members. Despite the generality of the Standards Committee’s name (which stemmed solely from intra-ALA political considerations, ca. 1979), its charge—not yet fulfilled—related solely to bibliographic standards. The Executive Committee’s unfortunate decision at one stroke added another layer of bureaucracy to RBMS, impeded progress on technical processing standards, and established an inadequate and inappropriate mechanism for review of nonbibliographic standards within the section.

This decision, however, can be seen to reflect the general undervaluation of cataloging, automation, and bibliographic control by many administrators in the field, who typically have little awareness of the importance of developing and coordinating standards in this area. Now that a few of the initial problems of doing rare book cataloging through the OCLC and RLIN seem to have been solved, some rare book librarians may be losing their interest in the remaining substantial issues. Many in the field have never understood the need to follow external standards of any kind, feeling that their institutional practice (dating in some cases from the nineteenth century) was probably the best that could possibly be developed. Now that they have modified their practice to the extent that they are allowed to participate in the national networks, they resent being asked to standardize their practice any further, even in the name of future benefits to themselves, other institutions, and scholars.

These attitudes seem to reflect a kind of institutional parochialism and lack of vision with regard to the role of special collections as a national research tool and not just a local resource or private treasure. This parochialism combines in some cases with a competitiveness with
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other special collections, a general unwillingness to engage in cooperative projects, and a highly developed chauvinism about the importance of their own collections. This is, of course, not true of all or even most rare book and special collections librarians, but it is prevalent enough to hinder the effectiveness of certain kinds of cooperative efforts in the field.

One might hope that the introduction of automation in rare book and special collections will gradually break down some of this parochialism as has been the case generally with many of the large research libraries. With those libraries, particularly ones that have joined the Research Libraries Group, automation has opened the door to a broader approach to cooperation that involves not only technical processing, but such areas as cooperative collection development, cooperative preservation plans, and a general attempt to consider the nation’s research libraries as a single, multifaceted resource, rather than as a multitude of warring fiefdoms.

Special collections may have an even more fundamental problem than parochialism, however. Many special collections seem to have only the haziest sense of their own goals and objectives. They frequently have no one-year plan, much less a five- or ten-year strategy, and no effective planning mechanism. Further, they often have no overall service philosophy and no very precise idea of what their role in research and scholarship is likely to be in the future.

Only a few years ago, this author consulted for a highly regarded rare book library with no automated processing. The assistant director of the library articulated his request approximately as follows: “We have some extra money, so we thought we’d get a terminal. What kind should we get?” The gentleman really had no idea what a terminal was or what it could do. He did not really want a study of what automation could accomplish for the institution—he just wanted a terminal. This was clearly an unwise approach to planning for anything much less something as complex as automation.

Another institution for which the author consulted asked whether they should retrospectively convert into machine-readable form their entire manual card catalog dating from the nineteenth century—not an unreasonable question on the face of it. However, when asked what institutional programs or services they wanted their cataloging to support more effectively or what more they wanted their catalog to do than it was doing already, they seemed bewildered by the questions as if no one had ever suggested to them that their cataloging operation had anything to do with the rest of their services and programs.
Yet another rare book library for which this author consulted seemed chiefly interested in having a report written that would prevent them from having their cataloging automated by the main university library to which they were attached. In many ways, that seemed the most reasonable request since they at least appeared to know what they did not want to happen to their programs and services.

Cataloging and automation are only tools, they are not ends in themselves. Those who administer special collections must know in some detail what their goals and objectives are in order to plan for what these tools can do. The best approach to planning for automation (or anything else) for most special collections would be to undertake a careful self-study of their users, collections, services, publications program, and institutional objectives, in conjunction with a thoughtful investigation of where research, scholarship, and automation are headed in the next ten years. Staff at all levels of the organization should be involved in an intensive goals-setting exercise and an institutional consensus developed about the directions to be taken. Administrators will also need to educate themselves and their staffs on a continuing basis about new technology and new work in bibliographic and other standards for special collections.

A general investigation of where research, scholarship, publishing, and library automation are headed, with particular emphasis on the role special collections should play in this, might in fact best be carried out at the national level so that the larger context would be apparent and so that other institutions could benefit from the exercise. This might well be something that grant money would be available for and perhaps sponsorship by one or more professional or scholarly organizations. Such a study could be seen as a natural extension of the 1986 Carnegie Commission report on higher education. Some of the questions to be addressed might include: Should special collections collect and catalog all the things that are currently being collected and cataloged? How are special collections actually being used? Who is using them? Who should use them? Who will use them in the future? Will different media be collected in the future? How can special collections be effectively exploited as research collections in a national and international context? Are foundation and grant monies being appropriately spent? Are special collections wasting money duplicating materials? How do the goals of special collections fit in with the goals of the larger institutions to which they are sometimes associated? Is enough money being spent on cataloging? Is too much money being spent on cataloging? Do all materials require full cataloging? Is some kind of minimal-level cataloging sufficient for most items, particularly those described fully in a
standard bibliography or national database? Is adequate information about these items being shared with other institutions? Do we need more computerized bibliographic tools like the Eighteenth-Century Short Title Catalogue (ESTC), or are such projects luxuries and expensive toys? Are computers in special collections really just fancy new baubles, or do they serve a real purpose? Will users of special collections really benefit from the efficiencies and new approaches computers will bring, or are they being served just as well by old-fashioned card catalogs?

At the very least such a study might raise the consciousness and level of discourse of administrators and library directors about these issues. It might also result in some surprising answers.

**Goals for the Future**

In the absence of a general investigation of the collections and services of rare book and special collections, one can only attempt an educated guess at the directions technical services in rare book libraries should take in the future. The following list of possible goals and activities presupposes that many special collections are indeed important for research, that automation can improve services and programs in such libraries, and that the cost of carrying out these proposals would be justified by benefits to users. However, these presuppositions are untested. A study of the kind proposed earlier might show that special collections are relatively unimportant; that automation will not measurably improve services in special collections; and that the costs of automation, standardization, and cooperation in this field far outweigh the advantages. Since there is so far no objective way to decide these issues, the reader must choose which set of prejudices to accept.

**In-Process Standards**

The standards that are now in process in the RBMS Standards Committee need to be finished as soon as possible. At present, these consist chiefly of the thesauri of access terms for physical description of rare materials. The first draft of these was produced in 1979 by the IRLA Ad Hoc Committee, and it is considerably past time for this task to be finished. This set of standards will finally allow special collections to have access in a standard and systematic way to much of the information formerly kept in special card files, often haphazardly. It will give increased visibility—and perhaps respectability—to many of the features that were important reasons for the materials having been collected in the first place and which special collections librarians have always intuitively known were important bibliographic access points.
Additional Standards Needed

Several additional standards are probably needed in the area of technical processing for rare materials. There would be many advantages, for instance, in developing standards for completeness of rare book catalog records. Increasingly, the database for special collections records is becoming national and international, and unless there is a reasonable degree of consistency in the composition of the records, the effectiveness of this database will be impeded. Some committee, institution, or individual is needed to study National-Level Bibliographic Records—Books, as well as the input standards of the three major bibliographic utilities, to determine whether they are appropriate for rare materials cataloging. Then, additional standards need to be developed addressing the routine inclusion of the newly standardized rare materials access points, such as genre, printer, publisher, binding, and place of publication. It may be that for optimal national access, a certain level of special added entries should be routinely provided in a rare book catalog record.

The applicability of minimal-level cataloging to rare books should be studied. It may be that certain categories of material are reasonable (even desirable) candidates for minimal-level cataloging. Furthermore, like it or not, some special collections will inevitably need to process a great many new items in a short period of time or want to bring their arrearages under control quickly, or they simply will not be able to afford a full-level catalog record. For these reasons, a suitable standard for which data elements to include in a minimal-level rare book catalog record should be defined.

Along similar lines, a set of guidelines for the retrospective conversion of rare materials' catalogs might well need to be developed. A good deal of retrospective conversion is either going on now or being planned among institutions of all kinds, and questions frequently arise about how it should best be carried out, for example, which data elements will be included, which enhancements should be made to the records, which level of bibliographic consistency should be imposed on older records. These decisions, though frequently made locally, have more than local implications, and this should be recognized by the development of some kind of standard or set of guidelines for the retrospective conversion of special collections records. In the absence of such national standards, special collections records may end up being treated in exactly the same way that nonspecial collection records are and may also be subject to whatever the local vendor or computer center wants to provide.

Additional work needs to be done in the area of standards for copy-specific information, such as provenance, special physical fea-
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tures, etc. At one time, it appeared that this difficult problem had been solved; now, however, it is clear that the bibliographical utilities continue to diverge in the way they handle this information such that certain kinds of collaboration among libraries belonging to different networks may be difficult or impossible. This issue needs to be opened up again, particularly in light of the pending implementation of the new USMARC Format for Holdings and Locations.

The area of preservation is increasingly important for libraries of all kinds. Leaving aside questions of preservation approaches and techniques, the representation of preservation and conservation information in the MARC catalog record is sorely in need of standardization. Work has begun now at the Library of Congress to address this problem; rare book and special collections librarians need to participate in the development of this standard and to make sure of its implementation at the network level and that it locally serves their needs.

Collaboration with Other Types of Special Collections

In a different direction, another important area for additional work is that of coordinating existing and future rare book standards and projects with those being developed or planned by those working with other, specialized nonbook research collections. In many cases, rare book standards may be able to be used as a point of departure, or at least a point of reference, for other standards groups. One of the lessons of the past few years has been that special collections in different areas, such as rare books, graphic materials, manuscripts, maps, music, archival motion pictures, even machine-readable data files, have a great deal in common in terms of specialized access requirements. Another lesson is that special collections are much more effective in getting what they want from networks, vendors, and foundations when they collaborate with each other. Yet another lesson is that, unless technical standards in these diverse areas are coordinated, the result will be incompatible system requirements, duplication of work, and loss in effectiveness in providing consistent access techniques for these materials. In short, more efforts need to be made to increase communication among these groups, with the goal of increasing coordination and effectiveness, and maximizing the lobbying power of special collections as a whole. The RBMS Standards Committee has made a start at this, but much more needs to be done.

Relations With Bibliographic Utilities

A continuing effort also needs to be made to discuss the objectives of special collections cataloging with the bibliographic utilities. The fact
that special collections are split between OCLC and RLIN means that most especially close coordination is needed to make sure that both utilities are responsive to the proposals of the special collections community. Further, libraries belonging to the different utilities (or having stand-alone local systems) need to make sure that their cataloging—including specialized access points and copy-specific information—remains compatible to the greatest degree possible so as not to exclude cooperative enterprises that involve records from both major utilities.

In addition, it seems that planning for automated support for special collections is proceeding increasingly under the aegis of network and consortium planning groups rather than at the national level. This makes coordination between the utilities and national standards and planning groups even more essential so that those in one bibliographic utility do not overlook the eventual impact that their planning may have on their colleagues in the other bibliographic utility. At the very least, information needs to be widely disseminated about these network-specific planning activities.

The networking environment that has developed over the past few years, in which decisions about bibliographic control are made relative to the bibliographic utility to which an institution belongs, is a new one that is fraught with implications for those interested in national planning for special collections.

Relations with the Library of Congress

The Library of Congress remains an important resource for U.S. libraries in the area of standards and other kinds of planning and coordination. The RBMS Standards Committee and other similar groups should attempt to maintain and increase their contacts with LC. One way to do this might be to seek formal representation from LC at its meetings or perhaps seek an informal arrangement whereby someone from LC attended when it seemed particularly useful.

Information About Vendors of Computer Services

Private vendors of computer services have a great deal to offer special collections with files of MARC records. They can provide printed bibliographies, finding lists, special database searches, in-house online catalogs, and other research tools. A committee or institution should act as a clearinghouse about such vendors and their services particularly those appropriate to special collections. Information about vendor performance might also be made available. This service would be of enormous value to institutions attempting to find a vendor for the first time.
Microcomputers

Many institutions now have, or are planning to acquire, microcomputers. Although these are being used now primarily for office automation tasks, they will increasingly be used to perform certain bibliographic functions. A committee or institution should undertake to produce a list of microcomputer software packages suitable for special collections. This will make it unnecessary for institutions always to go it alone with the expense and possibilities for disaster that acquiring microcomputers entails.

One caveat here: while microcomputers may in the future hold out many benefits to special collections, they also seem to have the potential of returning us to the dark ages of purely local practice in terms of cataloging and automation standards. Use of the bibliographic utilities has gradually imposed a basic consistency and standardization upon catalog records—something they never had before in special collections. Given their history, it would not be surprising if some institutions leapt at the chance of doing cataloging directly on microcomputers in order to get some of the advantages of automation but still continue to catalog the way they did a hundred years ago. (There has in fact been some evidence of this kind of activity in the published literature.) As a trend this would be disastrous for the future of collaborative efforts among special collections to create research tools that span more than one institution. As difficult as it may be for some to accept, cataloging and format standards are absolutely essential, both for the future use of the institutional database being created and for the future of national and international bibliographic control. Microcomputers should generally not be used for cataloging in place of a local or national system unless a mechanism is in place to communicate those holdings subsequently to a national database.

If cataloging is done on a microcomputer, it should in all cases be done according to the MARC format and according to AACR2/Bibliographic Description of Rare Books, even if only minimal records are created. Unfortunately, few if any bona fide MARC-based microcomputer software packages exist (except as an intermediate step in retrospective conversion to a larger system). The rare book and special collections community might do well to promote or even sponsor the development of such a program by a software vendor. (Note that such a program would need only to support MARC for input and output to other systems; use of MARC for public display or retrieval would not be necessary or even desirable.)
Name Authorities for Rare Materials

Another project that might be worth considering, results from the need for standard, AACR2 name authorities for older and specialized headings. Some institution or group of institutions might well tackle the problem of the lack of such authority headings for printers, publishers, and other older and specialized headings since the Library of Congress has not and will not establish most of them. A plan could be developed to have them done systematically so that all institutions cataloging these materials could benefit. To some extent, this is exactly what is now being done for a restricted group of older headings by the ESTC/North America office at the University of California at Riverside and by the American Antiquarian Society which have both been adding records to the national authorities database for several years. The body of names these institutions will cover, however, is just a small portion of those that will be needed by special collections. The benefit of developing a programmatic approach to this is that, if the authorities are standardized—e.g., by being routed through the Library of Congress Name Authority Cooperative Program (NACO)—they then become the authorized heading and available to all other U.S. institutions. At present, each special collection is largely on its own in establishing AACR2 name and title headings and, besides incurring the great expense involved in doing authority work, they may well end up duplicating work already done by other institutions.

Copyright of Bibliographic Records

In a different direction, the issue of the copyrightability and ownership of machine-readable bibliographic data is one that should begin to be studied by those in special collections. This issue is, of course, of more general interest in the library world as a result of events such as OCLC's attempt to copyright its database a few years ago. Special collections in particular should be studying this problem, however, because they are among the users of MARC records with the greatest potential for exploiting them for printing, publishing, and creating specialized databases.

The Eighteenth-Century Short Title Catalogue database has been virtually unusable for shared cataloging because of decisions of the ESTC owners to try to control access to the database in order to achieve maximum financial compensation—this, by the way, in the context of a project that has been funded by hundreds of thousands of dollars of NEH, foundation, and other governmental monies. Increasingly, institutions are spending money (usually grant money) to create databases and then deciding to try to sell access to their files. The implications of
this approach to the creation and marketing of research tools needs to begin to be scrutinized. The long-term effect of this would appear to be divisive, contrary to the tradition of information-sharing among libraries, and probably not cost effective. Excessive attempts to control and profit from library-generated information through copyright and contractual restrictions can only cripple widespread cooperation among special collections.

Image-Transfer Technology

Rare book and special collections librarians need to begin investigating the development of yet another new technology with important implications for them. Faster than we may have expected or wanted, digital technology will soon be used to reproduce library materials themselves in hard copy and on terminal screens and television monitors. The Library of Congress, for example, has already transferred tens of thousands of images from several important photographic and graphic collections to videodisc on an experimental basis. An optical disk player in the LC Prints and Photographs Division displays these in an easy and effective manner. The images are clear, bright, and eminently usable. This technology is incalculably more effective and user friendly than microforms. For some purposes, the originals of items preserved on optical disk will always need to be consulted; but for many others, this kind of reproduction will be sufficient and highly attractive, particularly for delicate and deteriorating items.

The rare materials community should perhaps consider commissioning a study on this newly emerging technology to try to begin to determine its implication for special collections. In the not too distant future the library community will see bibliographic retrieval systems "married" to optical retrieval systems such that MARC records may be used to gain direct and immediate access to images of the original. This technology will increase the ability of specialized collections to make rare materials available for reference on-site or long distance since digitized image information is easily replicable and can be transmitted over ordinary phone lines.

National Research Tools

Finally, efforts should be made to begin to study the feasibility of developing truly nationwide research tools for special research materials. This is especially important because of the division of the nation's research libraries among the two large bibliographic utilities. Despite the fact that the RLIN system is greatly superior—so far as the representation and retrieval of rare materials catalog records is concerned—not
all libraries can or should belong to RLIN. Further, it seems unlikely that OCLC will substantially change its "master record" approach to database design such that libraries can see their own and other libraries' copy-specific information online. This bibliographic cleavage among libraries may in the future devolve into an even more fragmented environment with numerous automated local library systems, none of which has ready access to other institution's copy-specific records.

One sign of progress here is the Linked Systems Project (LSP)—through which LC, OCLC, and RLIN, and ultimately other systems—will engage in computer-to-computer communication such that, for certain applications, a user in one system, using his own terminal and command language, will be able to search and retrieve records from the files of the other systems. Initially LSP will involve only the transfer of authority records; the bibliographic component—i.e., the retrieval and transfer of full catalog records—is currently two to four years away. LSP holds out immense potential for increasing the level of cooperation and communication among all libraries. It will also, it is hoped, have the effect of reducing the number of bibliographic and format practices that diverge from system to system. LSP will also make easier the sort of collaborative name authority project for older headings proposed earlier in this article. For many kinds of applications, LSP should benefit rare book and special collections libraries and general libraries alike.

However, for several reasons, the usefulness of this kind of record exchange for specialized collections may be limited. One problem is OCLC's master record approach to database building which will continue to make it difficult or impossible for libraries to exchange copy-specific information with one another. Another is the lack of standardization in the way RLIN libraries have implemented copy-specific access points. The increasingly fragmented bibliographic environment of the future may also present difficulties. Even if local library systems all implement LSP, a library might be faced with communicating directly with dozens of local systems to find out about other copies of a rare item. It may well be that bibliographic utilities and automated local library systems will never be able to support a coherent national database for rare book and special collections that would allow for all the types of information, access points, and output products that they should have.

A different possibility, one which would circumvent some of the problems presented by the mix of bibliographic utilities and local library systems, might involve the creation of a kind of substitute national database for rare materials and special collections. It would call for all participating institutions currently doing standard, MARC
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cataloging, regardless of the bibliographic utility or system, to begin to
pool their transaction or archive tapes on a regular basis to form what
would amount to a "National Union Database of Rare Books." This
would be a permanent work-in-progress, of course, since most special
collections are not yet doing retrospective conversion of their collec-
tions. Even so, it could immediately solve many of the problems asso-
ciated with using the bibliographic networks. For instance, such a
union catalog could have specialized indexes by printers and publish-
ers, by place and year of publication, and by genre. It would probably
have to be published in microform in the short term, but the day is not
far away when the entire database could be made available in individual
libraries either on magnetic or optical disk—e.g., on CD ROM—for
access through a microcomputer. This research tool could prove invalu-
able for scholars and researchers, reflecting as it would the full range of
rare materials resources of the United States. It could allow the copy-
specific information for each copy rather than just the "master record"
to be displayed online. This would finally allow all participating
special collections’ catalog records to be seen in their rich bibliographic
and associational context. Institutions could also use this database to
provide access to their own collections as well as those of others.

To be successful, this project would not necessarily require com-
plete participation by every U.S. library. In a sense it amounts to
forming a functional consortium around the bibliographic utilities and
local systems, bridging the schisms between them and enhancing the
possibilities for access to rare and research materials nationwide. It
would not necessarily require seeking additional funds for retrospective
conversion since each institution would simply contribute its existing
MARC archive tapes and future tapes on a current basis.

A National Union Database of Rare Books would be a large project
to coordinate, but it would not be breaking any new ground in its
technology. This proposal seems worthy of serious consideration by the
field and one for which major foundation support might be had. An
important side benefit of a project like this would be to increase people's
awareness that special collections are a national resource, not just
institutional or local. In addition, in practical terms, it might make
possible the production of certain kinds of related, spin-off research
tools at a lower cost than would otherwise be possible, e.g., a biblio-
ography of 19th century children’s books in U.S. libraries, catalogs or
printed bibliographies for individual institutions.
Conclusion

The field of computer-assisted bibliography is in great need of imaginative leaders and energetic participants. The development of nationally accepted bibliographic and computer format standards coupled with judicious use of new technologies is opening exciting possibilities for creating and exploiting a truly nationwide database for rare books and special collections. The realization of these possibilities, however, requires full commitment to standards and cooperation at both the national and local levels based on a careful assessment of the goals and objectives of rare book and special collections and their potential value to research and scholarship in the future.

Editor's Note: This article is a revised version of a talk delivered at the Columbia University School of Library Service Summer Rare Book School, 30 July 1984.
A FEW LIMITATIONS TO THIS PAPER should be stated at the outset. First, this is an analytical and historical overview of the need for standards in rare book work and of the development of such standards. (Rare book work is meant in a very broad context and involves work with rare books, serials, manuscripts, graphics, and even realia.) For a philippic on these and related matters, see Stephen Paul Davis's paper in this issue of Library Trends. Second, the standards discussed are those pertaining to cataloging, not those which might be used with other aspects of rare book work. Uniform order or claims forms are not under consideration here, nor are standards for professional ethics (to go further afield), nor standards for the transfer of materials from general collections to special collections. A final limitation is chronological. The word automated in the title of this paper confines us to the last fifteen or twenty years or since the development and implementation of Machine-Readable Cataloging (MARC). We are further limited by the fact that most developments in rare book standards have occurred only in the last eight years or since the publication of the Independent Research Libraries Associations's Proposals in 1979. Within these limitations, the scope of this article is an examination of what standards are, where they are needed in cataloging, why they are needed, how they have evolved, and how they may continue to evolve.

Standards can be described as instructions for doing something uniformly. In cataloging, these instructions are for a uniform way of
describing a book (or other object) and for uniform ways of retrieving the descriptive record. Cataloging standards thus allow for uniformity of identity and uniformity of means of access. Identity means the bibliographic description of a book—i.e., the transcription of its title and author statement, imprint, collation, and notes. By "means of access" is meant what are usually termed access points, or names, terms, etc. associated with the bibliographic description that allow it to be retrieved. Examples of these access points are main and added entries, subject tracings, citations to bibliographies, and terms indicating such things as genre and illustrative technique.

Why are standards needed? To put it simply, in order to communicate. Standardized descriptions are necessary if the holdings of the library are to be properly identified and communicated; standardized access points are necessary for collocation, or bringing like materials together. This communication occurs within a library—between catalogers, other staff members, and users of the library's collections—and between a library and other libraries, institutions, and potential users. Communication cannot take place without a shared language; in cataloging that language is a set of accepted standards.

To demonstrate why standards are needed let us look at some examples of how a lack of standards, or different standards, have impeded identification of materials and access to them. Problems with identification will be examined first and then problems with access.

The first example is that of a lack of standards and is taken from various entries in the National Union Catalog: Pre-1956 Imprints. This catalog has been edited to ensure uniformity of choice and form of entry; with a few exceptions given in the introduction to volume one, all main entries have been brought into conformity with the rules for choice and form of entry found in the 1949 A.L.A. Cataloging Rules for Author and Title Entries. However, a standard for bibliographical description has not been imposed, nor could it be without an examination of the books themselves. Records contributed by many hundreds of libraries include descriptions based on standards found in quite a number of published cataloging codes; some descriptions seem to be based on local or in-house standards; and a few descriptions seem to be clipped from booksellers' catalogs. As a result of the attempt to select only one of these descriptions as a master record for each edition (or, in some cases, issue), two things have happened that obscure bibliographical identity. In some cases the same edition or issue is represented by more than one master record, it being impossible to tell because of the lack of a standard of bibliographic description whether or not the same edition or issue was being described in the different contributed records. A more serious
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problem is the conflation of records for different editions or issues under a single master record: this is only sometimes apparent, as when the record for another library has been selected for the master record, the symbol for your library has been added as a holding location, and yet your library holds a different edition or issue of that title.

Different standards can also impede the identification of materials. An example of this is the specification in all editions of the ALA cataloging rules that the size of the book be given as the last element of the collation. The British have traditionally preferred to give the format of the book instead. These two approaches to one aspect of the physical description of a book result in records that are not at all interchangeable, nor in many cases, comparable, at least in this aspect of their descriptions. As a result, a British librarian with records for two editions of a book distinguishable only by format (say octavo and quarto) could not tell which edition was being described by an American library which recorded only that it measured 19cm.

A final example of how different standards of description can impede identification can be found in the contrasting provisions of two current catalog codes for rare books: those prepared by the Eighteenth Century Short Title Catalogue project (ESTC), and those prepared by the Library of Congress (LC) Bibliographic Description of Rare Books (BDRB). ESTC prescribes giving the number of plates in a book only when they are numbered; otherwise that part of the collation is to read simply “plates”; BDRB specifies that the number of plates is always to be given. A cataloger using BDRB and attempting to describe a perfect copy when an unknown number of plates is missing in his copy would not be helped in this regard by an ESTC record. The statement “plates” in the collation would also be unhelpful to a researcher interested in consulting only one of several issues of a book when those issues could be distinguished only by the number of plates in each. ESTC also prescribes that blank leaves not be included in the collation; BDRB prescribes that they should be. Unless notes are required in either code (which they are not), the resulting dissimilar collations will seem to indicate variants. A final example of the disparity of approaches taken by these sets of cataloging rules is in their treatment of supplying a date of publication to an undated book. BDRB, following the examples given in the Anglo-American Cataloguing Rules, 2d ed. (AACR2), allows a broad, and perhaps vague, approach to giving imprint dates. A book probably printed in the eighteenth century should have the date [17--]; one probably printed in the 1730s would have the date [173-?]; etc. One probably published between two dates less than twenty years apart may be assigned a date such as [between 1718 and 1730]. ESTC takes an
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entirely different approach: all dates are to be expressed in four digits. A book probably published between 1708 and 1712 is to have the imprint date [1710?]; the same imprint date is to be assigned to those probably published between 1705 and 1715 or between 1700 and 1720. This does not at all lead to a compatibility of records or bibliographic identity even when both methods of description (in this and other matters) are understood and kept perfectly in mind.

To turn to access, two examples of how the lack of standards, or of different standards, can impede access to materials will perhaps suffice. The first example, or rather series of examples, involves a lack of standards and will show how certain libraries attempt to provide access to their collections by means of special access points before the MARC formats had allowed them to do so in a uniform and universal way. One library maintained all of its special files manually while regular cataloging was done using MARC. The number of cards needed for, in this case, chronology, provenance, press, and collection files were counted up at the time of card production; that many extra cards were obtained. A record was kept on the cataloging work form of how many extra cards were needed and what headings were to be typed on each. When the card set arrived, the headings were typed (with corresponding tracings on main entry and shelflist cards) and the cards were filed. There were two major problems with this approach: (1) it required a great deal of labor and record-keeping; and (2) it failed to bring the library's entire record for a book under computer control so that the card catalog remained the central record of the library's holdings and an archival computer tape was largely worthless.

Another library appropriated all of the local subject fields (MARC tags 690-693) for its files. They were delegated as follows: 690 for chronology and techniques of illustration; 691 for place of publication; 692 (person) and 693 (corporate body) for provenance, printers, and bookbinders. This is at least computer cataloging: the files are represented on an archive tape and can be searched. In one case a successful combination search was made, using the archive tape, for books with aquatints published between 1785 and 1815. This would not have been possible with the library's card catalog. And yet this approach too had its drawbacks: local subjects had nowhere to go, there was not a one-to-one correspondence of tags and files, and much free-text searching was required.

A third library devised the following plan: printers, presses, and names of former owners were put in field 700 or 710 as appropriate. The name of the printer, etc., was preceded by subfield g and a two or three letter code for the appropriate file. Binding types and chronology trac-
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ings were put in field 630 with a similar preceding code. This was probably the most effective of the three approaches, although even here field 630 was inappropriately used, and the special file cards had to be removed from the main catalog sequence.

The real problem with all three plans is that they were local solutions peculiar to that library, and in all cases computer access to these data (when possible) required specialized programming. Perhaps most importantly, shared cataloging was not being fully shared, and specialized access was not being provided outside the library.

An example of how different standards can impede access to materials can be seen in the results of the simultaneous use of two different thesauri for genre terms that have been published within the past few years. Both list terms which, when added to field 655 of a MARC record, allow access to that record to a researcher seeking items of a certain genre (e.g., penny dreadfuls, or farewell sermons). One thesaurus, Genre Terms,* was prepared by the Standards Committee of the Rare Books and Manuscripts Section (RBMS) of the Association of College and Research Libraries (ACRL). It is a list which may be used to identify the intellectual (as opposed to physical) genres of all types of materials, including both books and manuscripts. Two years later the Research Libraries Group (RLG) published Form Terms for Archival and Manuscripts Control. It listed both intellectual and physical genres and was intended to be used with the MARC format for archives and manuscripts although it can be used with other formats including books. Thus terms in either list could be used to describe intellectual genres of manuscripts and archives. What is the problem? The lists are not at all coordinated, and the same concept may be found expressed in different terms in the two lists. Thus we have, for example, RLG's bills (legislative), catalogues, and librettos v. the Standards Committee's bills, catalogs, and libretti, and the approaches taken to identify types of journals are entirely incompatible. The result is that a researcher trying to retrieve certain genres of archives and manuscripts will be impeded in his/her search by the existence and use of two different standards for identifying such genres.

It is hoped that these examples, along with the preceding remarks, demonstrate the necessity of standards, especially in an automated environment. Happily, standards already exist for most important areas of rare book work, and this paper concludes with an examination of how they have developed. This examination is divided into two parts: standards for bibliographic description and standards for access.

The historical development of a code or codes for the bibliographic description of rare books is very recent: until this decade none had been
published. There have been various catalogs, handbooks, treatises, and cataloging codes that could be used in whole or in part with profit in treating rare books. Cataloging rules for certain subsets of rare books (notably for incunabula) have been used since the nineteenth century, but these could not be used, even if they were published and available, with all rare books in a library's collection. There have been general rules in which little or no attention to rare books was given: Panizzi's of 1841; Cutter's of 1875; ALA's in 1908, 1941, and 1949; AACR in 1967; and AACR2 in 1979. Finally, there have been a few treatises (Paul S. Dunkin's *How to Catalog a Rare Book* is probably the best known) and the specialized bibliographers' handbooks by McKerrow, Bowers, and Gaskell.

The information given in these publications was either inadequate or too restrictive for most collections of rare books. As a result, each library has gone its own way until quite recently, usually adapting in-house one of the sets of rules, especially the 1941 ALA rules, or AACR, or AACR2.

This was no problem until the late 1960s and early 1970s when computers and networks first appeared in libraries. Although slow to take to computer cataloging, most rare book libraries eventually saw the benefits, the main ones being: (1) multiple use of a single effort to reproduce cataloging, and (2) consistent posting of holdings information to an online union catalog. To achieve these benefits a uniform standard of bibliographic description using MARC was necessary, and no such standard existed. (It was imperative to use MARC since it had been designed for the international communication of cataloging data in computer-based systems.)

The International Federation of Library Associations and Institutions (IFLA) was the first to develop such a standard. A little background first: descriptive cataloging codes for preparing machine-readable records for many types of materials (including rare books) began to be created soon after the first presentation by IFLA of the *International Standard Bibliographic Description for Monographic Publications* or ISBD(M) in 1973. The impetus for a code for older materials was the attempted and unsatisfactory use of the MARC format in cataloging projects at the Bibliothèque Nationale, the Bodleian, and the National Library of Scotland in the early 1970s. The problems with MARC were again noticeable with the beginning of the ESTC project in 1976. But even before this time it was realized that the problems were not so much with MARC as with ISBD(M), in which it was specifically stated that its standardized form of description for international
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exchange of bibliographic data was applicable primarily to current materials.

An IFLA committee began work on a code for rare books (eventually called International Standard Bibliographic Description for Older Monographic Publications [Antiquarian] or ISBD[A]) in 1975. It was modeled on the International Standard Bibliographic Description, Annotated Text or ISBD(G), a skeleton code that was the basis of a number of specialized codes, which itself had only been published in 1975.

From the start the IFLA committee paid particular attention to the accurate transcription of the title and a complete collation. As finally published in 1980, the rules call for an exact transcription of the title (if transpositions are made, they are to be noted), and a collation in which every page, printed or not, is to be counted. No rules of application are firmly given (a cutoff date of 1801 is suggested); libraries are to decide for themselves what types, classes, or categories of books are to be cataloged using ISBD(A).

The purpose of the code is "to aid the international communication of bibliographic information" by (1) making records from different sources interchangeable; (2) helping the interpretations of records across language barriers; (3) assisting in encoding records in machine-readable form; and (4) providing precise transcription of title to identify works.

Before ISBD(A) was completed, the ESTC project had begun. This project, which is still underway, is an attempt to identify, and provide bibliographic records for, all eighteenth-century books printed in Great Britain and her colonies, or printed in English anywhere. (Full information on ESTC will be found in Alston and Jannetta's book on the project, which includes an early version of the ESTC cataloging rules.) Since no rare book cataloging rules had been published, ESTC developed its own based on a version of MARC used in the United Kingdom. Its rules were relatively simple, as befitted a short title catalog, and were not of universal application since they were only designed to be used to describe eighteenth-century English books.

The work on ISBD(A) and especially the ESTC projects involved many American librarians who in the late 1970s began to push for a national rare book cataloging code. The burden of preparing it was accepted by the Library of Congress.

The first draft of the code was distributed in December 1979 as Rules for Bibliographic Description of Early Printed Books, Pamphlets, Broadsides, and Single Sheets. It was to be used in the descriptive
cataloging of all rare and special collections books at LC no matter how old; in cases of doubt there was an arbitrary cutoff date of 1801. It was emphasized that other libraries might want to use it and might want to apply it in the same way.

The rules were an attempt to incorporate provisions of ISBD(A) into a framework of AACR2 (the two had not been coordinated earlier because AACR2 was being finished at the same time ISBD[A] was beginning). The rules include some material present in neither code but compatible with both. An accurate transcription of title (with notes to indicate transposition) and a collation that accounts for every page, printed or not, are features the rules share with ISBD(A). The final form of the code was published in December 1980 with the much more sensible title *Bibliographic Description of Rare Books.*

BDRB was in turn the impetus for some other specialized descriptive cataloging codes which were to be used, in whole or in part, with rare materials. These codes include those for cataloging graphic materials, archives and manuscripts, and rare serials.

There still remained the second problem of attempting to provide access points customarily found in rare book libraries while using the MARC format which didn’t provide places for them. These access points have collectively been called special files: they allow a book to be found through its provenance, printer, publisher, place or date of publication, etc.

Some libraries did not even attempt to provide special file access in computer-aided cataloging; some continued manual cataloging because they considered such access invaluable and could not figure out how to supply it when using the MARC format. Many, if not most, libraries using MARC made strained efforts to get this information (and access to it) into their records.

Realizing that these and similar attempts were unsatisfactory, a small group formed to try to effect changes in the MARC format. It was a committee of the Independent Research Libraries Association (IRLA), an organization of mostly small, private libraries. Established late in 1978, its name was the Ad Hoc Committee on Standards for Rare Book Cataloguing in Machine-Readable Form and it consisted of members of IRLA and representatives from LC and a computer software company.

Its immediate impetus was the problems that developed during the ESTC pilot project at the New York Public Library. Some things wanted in that project were not available because of limitations of the project’s software or limitations of the MARC format or both. The committee thus met to formulate ways to get information important to rare book libraries into machine-readable records. Its first meeting was
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in March 1979; it issued an interim report\textsuperscript{15} in September of that year and distributed it to 150 British and American libraries. Their comments were reviewed in October, and a revised and final report\textsuperscript{16} was published in December. Most of its work was then passed on to the newly formed Standards Committee of the Rare Books and Manuscripts Section of the Association of College and Research Libraries.

The committee's final report consisted of fifteen proposals. Most of these concern standardized access, and they are summarized here with an outline of action taken to date.

Proposals one through six were submitted to LC's Automated Systems Office where they were discussed with representatives of the National Library of Canada and the networks. They were then presented by LC to ALA's Committee on Representation in Machine-Readable Form of Bibliographic Information (MARBI). Proposals one through five were for changes in the MARC formats for books, maps, music, and serials; proposal six was for the books format only. Proposals one through six, if accepted by MARBI, appeared in published form in the updates to the MARC formats.\textsuperscript{17}

The first proposal (IRLA proposal one) was to add a new field 655 to record a term indicating the genre of a work. The field would have topical, place, and chronological subdivisions. It was the experience of the committee that with older materials, access is often sought through the type of work a publication is—e.g., a sermon—rather than through conventional author, title, or subject approaches. A draft thesaurus of terms for field 655 was given in IRLA proposal eleven.

The proposal was accepted by MARBI in March 1980 and it was published in the updates to the MARC formats. Terms in the field may only be taken from a published genre thesaurus. Preparation of such a list for rare books was entrusted to the RBMS Standards Committee. For an account of the publication of this and other thesauri, see the summary of action taken on IRLA proposal eleven.

IRLA proposal two suggested a new field (752) for place of publication or printing recorded in an indirect fashion (e.g., United States—Pennsylvania—Philadelphia), since this access could not be satisfactorily retrieved from field 260 no matter which cataloging code had been used to prepare the record. Also proposed was a subfield \textit{j} in 752, so that this field could be linked with one or more 700/710/711 fields that contained names of individual printers, publishers, etc. Thus the combination

\begin{verbatim}
700 10 Franklin, Benjamin \#d 1706-1790, \#c printer and 752 United
States \#b Pennsylvania \#d Philadelphia \#j 700/1
\end{verbatim}
would link the Philadelphia place of printing with the printer Franklin, and allow one to retrieve books printed in Philadelphia by Franklin. IRLA estimated that this linking was important in about 15 percent of early imprints where two or more places of publication and two or more publishers, etc., were present.

The proposal was accepted by MARBI in March 1980 with one modification—that subfield j be deleted. It felt that the technique of linking had been developed for only a few specialized fields, and that it would rather not expand it further, awaiting instead a general solution to linking that could apply to all fields throughout the MARC formats.

IRLA proposal three requested field 751 for a direct recording of the place of printing or publication—e.g., Philadelphia (Penn.)—with the same subfield j linking device. The field was to be used by libraries that preferred direct access to place of printing or publication.

This was withdrawn from consideration by MARBI by mutual consent of LC and MARBI. The latter was unwilling to define two fields for the same information arranged differently. It also thought that the direct form could be automatically derived from indirect form as recorded in field 752. The proposal is considered dead by the Standards Committee.

Proposal four was concerned with copy-specific information, especially access by donors, provenance, and binders. Three new fields (790-792) were recommended to accommodate personal, corporate, and conference forms of names associated with a specific copy of a work. An important feature of these fields was subfield 5, which allowed a library (using its National Union Catalog symbol) to be identified with copy-specific information. For example

790 1 Blathers, Moira, #d 1898-1956, #e former owner #5 TxU

would indicate that the University of Texas copy of the book belonged to Blathers.

This proposal was only accepted provisionally by MARBI in March 1980 since it was unwilling to commit itself to setting up new fields for copy-specific information until the whole problem of accommodating such information in the MARC formats is solved. LC, the networks, and the National Library of Canada then suggested putting copy-specific added entries in the existing 700-740 fields with a new indicator 4 to show their nature; they also wished to retain subfield 5.

MARBI again discussed the issues in 1981 and accepted the proposal with modifications. The new indicator 4 was dropped, but subfield 5 was retained. Copy-specific entries are to be put in fields 700-740. Directions for the use of subfield 5, which can also be used with notes,
appeared in the updates to the MARC formats.

IRLA proposal five suggested a new field 755 for the recording of publishing or physical aspects of a work. A real grab-bag of terms was proposed for this field, deemed most useful to historians of the book. Following are the categories of terms, with an example from each:

- Publishing/bookselling (Large paper edition)
- Paper and papermaking (Watermark-Lion)
- Printing (Press figures)
- Typographic (Fraktur)
- Illustration (Chromoxylograph)
- Binding (Vellum)
- Provenance evidence (Autograph)
- Miscellaneous (Extra-illustrated)

It was thought that subfield j could again function as a linking device especially in the case of provenance evidence which could be tied to the name of a former owner. Subfield 5 was also needed to identify copy-specific entries. IRLA realized that the lists contained a mixture of copy-specific and general terms but despair of separating them.

This proposal was withdrawn from consideration before MARBI because of copy-specific problems (see discussion under IRLA proposal four), questions concerning the use of subfield j (see under IRLA proposal two), and the lack of thesauri or the prospect of any. The proposal was referred to the RBMS Standards Committee, which reworked it, dropping the requests that copy-specific information be identified, and that links with other fields be allowed. The revised proposal was resubmitted to MARBI and accepted. For an account of the lists of terms prepared for field 755, see the summary of action taken on IRLA proposal eleven.

IRLA proposal six requested a new field 309 for copy-specific collation (to be used in addition to the existing field 300). It was not presented to MARBI at the request of the Standards Committee. After some discussion, the committee decided to drop the proposal since it felt that this information could just as easily be recorded in a note.

Proposals seven through fifteen were mainly attempts to standardize terminology for the new access points requested in proposals one, four, and five. They included preliminary lists and thesauri which were referred to the Standards Committee for further work and eventual publication.

IRLA proposal seven was addressed to LC, the Council on Library Resources, the networks, and the Standards Committee. It asked them all to work toward accommodating copy-specific information within
the MARC format; it also specifically called for consideration to be given to this problem in the LC/Council on Library Resources review of the MARC format, which was then just beginning.

IRLA proposal eight was addressed to the Standards Committee which was asked to review and refine an attached list of relator terms (terms designating the function of a person associated with a book, such as printer, illustrator, or former owner). The revised list would then be submitted to the appropriate agency of ALA with the idea of amending AACR2 to allow the use of relator terms from the list. IRLA felt that some rare book libraries wanted to segregate the different functions of a person in their catalogs (e.g., separate the books that William Morris wrote, illustrated, printed, or owned) and that relator terms were necessary for such segregation.

The Standards Committee assigned an editor to the list, circulated and revised it, and published it. The committee then asked ALA’s Committee on Cataloging to permit the usage of the terms; approval was forthcoming. Meanwhile, LC had informed the Standards Committee that it will use at least some of the relator terms.

IRLA proposal nine asked LC and the Standards Committee to press for new characters in MARC’s expanded character set, specifically: superscript a and b (to indicate columns); superscript r and v (for recto and verso); π and x (for signatures); and || (for line endings). No action has been taken on this proposal.

IRLA proposal ten was addressed to LC, MARBI, and the networks, and asked that a filing override mechanism be developed in the MARC format so that records could be organized in a bibliographically significant way. It was recognized that the information needed to govern the filing order of records was sometimes not in a place where the computer could take it into account (e.g., in a note giving a bibliographic reference) and that a device could be developed (as it had been for ESTC) to allow a library to machine file some records in the way it wanted to. There has been no action taken on this proposal; it is possible that an expansion of the uniform title fields will be a more likely development than the formulation of a new device.

IRLA proposal eleven presented drafts of genre and illustration/graphic technique lists to the Standards Committee. The drafts were prepared in order to provide a standard vocabulary to guarantee internal consistency in a library’s records; to aid in shared cataloging; and to facilitate future long-distance access to the records of other institutions. The committee was asked to study, revise, publish, and maintain these lists. It was also asked to investigate the development of comparable lists.
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in the areas of publishing and bookselling; binding; typography; papermaking; and provenance.

A number of lists or thesauri have appeared to date. The Standards Committee prepared a general list of rare book genre terms;\textsuperscript{19} genre terms (as well as physical characteristic terms) have been developed for graphic materials;\textsuperscript{20} and a mixed bag of terms used to retrieve genres and forms of archives and manuscripts\textsuperscript{21} has appeared. The Standards Committee has also published lists of terms for printing and publishing evidence\textsuperscript{22} and binding styles and techniques;\textsuperscript{23} it is preparing thesauri for provenance evidence, papermaking, and type.

IRLA proposal twelve was addressed to LC and the Standards Committee; it asked for standardized citation forms for bibliographic references. After noting that a new field for bibliographic citations (510) had been approved for the MARC format, it recommended that citations for numbered reference works frequently consulted in rare book cataloging be standardized so that they could be employed as access points (like ISBNs). Such standard citations could also be used to generate lists of holdings of items recorded in such reference works. IRLA prepared a list of about 250 frequently cited works with suggested forms of citation and turned it over to the Standards Committee for further work. The committee agreed to undertake the task, but as it turned out the list was prepared at the Library of Congress although it was published with the committee’s sanction.\textsuperscript{24}

IRLA proposal thirteen asked LC to put purely local notes in a local field and requested other libraries to do the same. LC has agreed and will put all local notes into field 590 (general) or 591 (bound with). Such notes will begin with a phrase such as LC copy: or Rosenwald copy:.

IRLA proposal fourteen was addressed to LC (especially), the networks, and the Standards Committee. It asked that a nationwide authority system be set up so that AACR2 forms of names could be established quickly. It observed that new forms of entries for many older materials would not be established soon by LC and that many rare book libraries would need to set up such names before LC did. It suggested that some libraries be allowed to go ahead and establish such headings, possibly subject to LC’s approval. Such a system has come to pass. A number of special collections, as well as the ESTC project, have contributed authority records.

IRLA proposal fifteen was directed to LC and the Standards Committee. It noted that the provisions for rare book cataloging in AACR2 were inadequate and that ISBD(A), while useful, was in some ways
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incompatible with AACR2. It asked LC to develop rare book cataloging rules that would expand the small rare book section in AACR2. This, as we have seen, has been done.

Many methods of preparing and promulgating standards have been shown in this brief survey of the development of rare book standards to date. Some have been prepared by international bodies (IFLA) or projects (ESTC); some by national library organizations, or divisions, or committees of such organizations (ALA, ACRL, RBMS, and the Standards Committee of the latter section); some by institutions (LC); some, perhaps unwisely, by bibliographic utilities (RLG); and some have been private endeavors, although the latter have usually appeared in published form under the aegis of some organization or institution.

These various methods will undoubtedly continue to be used to develop such standards. All of these organizations, institutions, and even private endeavors welcome help, or at least are open to influence. Those wishing to initiate, influence, or even waylay a standard should be in contact.

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A Caucus-Race and a Long Tale: The Profession of Rare Book Librarianship in the 1980s

DANIEL TRAISTER

“What is a Caucus-race,” said Alice; not that she much wanted to know, but the Dodo had paused as if it thought that somebody ought to speak, and no one else seemed inclined to say anything.

“Why,” said the Dodo, “the best way to explain it is to do it.”...First it marked out a race-course, in a sort of circle, (“the exact shape doesn’t matter,” it said,) and then all the party were placed along the course, here and there. There was no “One, two, three, and away!”, but they began running when they liked, and left off when they liked, so that it was not easy to know when the race was over. However, when they had been running half an hour or so,...the Dodo suddenly called out “The race is over!” and they all crowded round it, panting, and asking “But who has won?”

—Lewis Carroll, Alice's Adventures in Wonderland

We know that there is a profession of rare book librarianship out there. Some people work in it. What it involves, however, seems a little less easily knowable. Perhaps the best way to explain it, Dodo-like, is to do it.

But not everyone does it. The vast majority of librarians will never have much to do with rare books or manuscripts. Nor will all who work with them do so in the same way. Their handling and functions differ from institution to institution and within institutions, work with them differs from position to position. Explaining the rules of the game is likely to prove difficult whether one is addressing those outside the field or those within it.

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Special Collections Operations

Special collections operations differ from one another. An observer might suppose that a person who works at whatever position in a rare book and manuscript department or library could assume, more or less indifferently, similar responsibilities in a college or university library, an independent research library, a historical society library, a special library, a public library, or a government library. Such a supposition is at least open to question.

The functions of rare book and manuscript collections at one sort of library (for instance, a university research library) are not entirely comparable to their functions at another (for instance, an urban public library). Some public libraries have closed or are questioning the merit of maintaining their rare book collections. Various circumstances explain such closings or questions; these may differ from city to city. Whatever they are, they suggest that a librarian with prior rare book experience at a research university is not automatically equipped to make a transition to a public library. Institutional functions may differ so markedly that a person’s ability to build, publicize, make accessible, and justify a rare book department can prove less adaptable to different institutional contexts than, in theory, we might expect.

Special collections positions also differ from one another. We might suppose that the librarians responsible for reader services in a rare book and manuscript library are as intimately acquainted with “rare book librarianship” as the catalogers who work for the same department, its acquisitions personnel, its subject specialists, its conservators, and its administration. But it ought to be instantly obvious that each will experience special collections librarianship in a distinctive way. Movement between different spheres of responsibility may be no simpler than, in other library situations, movement between public services and technical services.

All of this is to say nothing that a person who works as a rare book and manuscript librarian does not already take for granted, but it may not be obvious to colleagues elsewhere in the field. Rare book and manuscript collections are less different from other libraries than it may seem. Their similarities to other libraries—to the many different kinds of other libraries—are much more striking than their differences. Perhaps more precisely, these differences are no more striking than the differences among “ordinary” libraries, which variously serve small towns and big cities, hospitals and steel companies, elementary schools, community colleges and state universities, the U.S. Congress and state welfare agencies, rural agricultural counties, and technological insti-
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tulates. Like all libraries, rare book and manuscript libraries differ among themselves.

If special collections departments (as opposed to special collections libraries) differ at all significantly from other library departments, it is because their range of responsibilities is usually the equivalent of those which, in large libraries, are parcelled out among several departments. Special collections departments tend to be libraries in miniature. Acquisitions, public relations and fund-raising, exhibitions and catalogs, technical services, circulation, shelving, reference, copying, preservation, indeed, the whole gamut of tasks required to operate a library, are all also required to operate most special collections departments. Some are small enough so that their staff do a little bit of everything rather than practicing a specialty full-time. Others may have staff whose work is normally as specialized and stratified as is any library staff's. But for many who work in rare books, whatever specialized preparatory knowledge the field requires, it also encourages the development and use of more generalized professional skills than can be honed by those who work in circulation, reference, or acquisitions in a departmentally-organized general library.

Aside from this exception—which this author would not want to press too far—professional librarians who work in special collections find the experience of a professional career quite similar to the experiences of professional librarians in general libraries. Like all other librarians, rare book and manuscript librarians perform varied functions within their varied institutions. In consequence, it is as difficult to generalize about the profession of rare book and manuscript librarianship as it is to generalize about the profession of librarianship itself. All of us know, more or less instinctively, that people who begin their careers doing reference in a law firm library, acquisitions at a large research library, circulation at a public library, or cataloging at a historical society, are likely to have differing career paths. If the career paths of those who work in rare book and manuscript libraries are any less diverse or are diverse in unusual and distinctive ways, this author has yet to hear about it.

Physical and Psychological Isolation

The sense of a difference between rare book personnel and general librarians persists nonetheless. There must be a reason for it. One reason may be simple physical distance. The demands of security cause the placing of many special collections in their own wings, relatively inaccessible rooms, or entirely separate floors or buildings where their staff
do not easily mingle with colleagues elsewhere in the system. Special collections personnel themselves frequently complain of feeling isolated from their colleagues. They are often speaking the literal truth without necessarily being consciously aware of it. Forging relationships—professional or otherwise—with people who require an appointment to meet, or whom one reaches only after passing through cages, locked doors, and security devices, is difficult for those not in special collections. Similarly, the opportunity for special collections librarians to maintain both formal and informal contact with colleagues and to become involved in and have an influence on the daily operations and long-range policies of an entire library can be very hard to seize when those same special collections librarians are locked away with their books and manuscripts in a metal cage.

Another reason for this sense of distinction between rare book and general librarians is that the profession as a whole has not adjusted to the change in rare book personnel which has occurred during the last decade or so. The generation of men and women who built the majority of rare book collections in this country, by and large building them as self-conscious and separate units of larger libraries especially during the decades following the end of the Second World War, has generally retired or died. The economic expansion characteristic of that period has also died. Far fewer collections are now being built in quite the same way. The antiquarian book market may or may not be more limited in what it can provide budding collection builders. Despite the many theorists who believe that great books are no longer to be found, other more persuasive theorists suggest that an institution with money can find just about anything. It is money and not books that is in poor supply.

As a result of this change, different sorts of personalities have been recruited into or attracted by the field. On the whole they are not collection builders. Their budgets do not permit them to be. They are instead people who see their task as trying to manage the collections they have inherited, ordering them, cataloging them, publicizing them, making them function in their libraries or in the scholarly communities their institutions exist to serve. In another era it might have seemed possible and even desirable to acquire single-mindedly bulk collections of extremely uncommon materials and to postpone worry about how to make them accessible to readers. One's job was to put books on the shelves. The date has now arrived when rare book librarians, often unable to acquire bulk collections except as gifts, can no longer postpone making accessible to scholars what is already in their collections. In cooperation with their colleagues in technical services and systems, their task is not
simply to put books on the shelves but also to put cards into the catalog or records into the database and to worry about service to the readers whom these records attract.

Rare book librarians nowadays tend also to be less exclusionary about their collections than their predecessors felt able to be. The previous generation was doing something new in a library world not always sympathetic to the segregation of expensive treasures into reading rooms which resembled private gentlemen’s clubs. (I borrowed this image from a recent biography of Theodore Dreiser which uses it to describe the reading room of my own institution’s Special Collections Department. The image is embarrassingly close to the truth.) If they appeared less than warmly welcoming to outsiders, this was not because they wanted to keep hoi polloi from polluting the incunabula and polished calf. All outsiders—colleagues as well as readers—might disperse materials which needed protective security and special handling. Through the adoption of exclusionary policies, that generation appears to have felt that they might better defend older, fragile, and special materials against a false democratization which would have left them at risk. Such dispersal might also have destroyed, even before they were fully formed, the intellectually unified creations that such collections might ideally become.

Their successors are no less concerned for the physical safety of the materials in their care. In an era of ever-increasing prices and well-publicized book thefts, they can hardly afford a cavalier disregard for security. But they are also more aware of the essential indivisibility of the research process. Fifteenth- and sixteenth-century imprints are never the sole resource of a researcher. Those historical collections function best which exist in the context of recent and current secondary scholarship and reference tools—that is, in large, comprehensive research libraries. The larger and more comprehensive the research library the better. There are good reasons why more scholars use rare books at Bancroft and Houghton, surrounded as they are by the vast nonrare book resources of Berkeley and Harvard, than use them even at such immensely rich collections as those of the Huntington or the American Antiquarian Society. A healthy relationship with one’s larger institutional context, or with one’s neighboring library, is no longer perceived as something to be courted only with extreme care.

Simple survival is still the issue although it is pursued in new ways to suit altered economic circumstances. Special collections are expensive to run. If their holdings remain inaccessible and unknown, or if the tools which help to use and interpret them are unavailable, then they may attract so few readers that their costs outweigh any conceivable
returns—i.e., prestige, a show-off stop for the V.I.P. tour, pedagogical utility, source of scholarly publication. They may then be closed or dispersed. This is not merely a theoretical possibility. Libraries that have already closed or dispersed all or parts of their special collections include the Detroit Public Library, Hofstra University, and the Franklin Institute. Other libraries have questioned the continued existence of their special collections operations.

Current managers of special collections therefore face different imperatives from those faced by their predecessors of the previous generation. They must cooperate within their institution with their nonspecial collections colleagues. They must cooperate outside their institution with colleagues at neighboring or distant libraries who represent potential sources of necessary information that their own library cannot supply. They must seek readers. In general, they must seek support. At least some of their predecessors, several of whom seem to have left behind a two-faced reputation (a great collection builder; but also a dragon both to colleagues and to readers), might have found such imperatives incomprehensible.

But memories of the dragons still affect the attitude of the profession at large to the rare book community today. Contemporary librarians tend no longer to condone or to facilitate a single-minded concentration on collection development and exclusionary attitudes to readers. The costs in lost intra- and inter-institutional cooperation, reader services and support, and the ability to justify the utility of special collections whose utility may not be self-evident in all libraries, seem too high. The dragons may generally be gone, but their legacy lingers. That most of the dragons' successors behave very differently, responding to an altered environment, seems to have escaped widespread notice.

One result of this long-lived memory is that career paths for those in special collections differ in at least one respect from career paths for those in other areas of librarianship. From reference, acquisitions, circulation, or systems, a person may reasonably hope to advance within a library of any kind to progressive levels of supervisory responsibility. The prospect of becoming a library director is not unthinkable, although it is, of course, not common for most librarians actually to do so. For the vast majority of people in special collections, however, such a prospect remains not only uncommon but also very close to unthinkable.

Special collections personnel are not necessarily more "ghetto-ized," except physically, than catalogers or humanities bibliographers. But the cataloger or the bibliographer may find opportunities to
advance—either within an institution or from institution to institution—which the special collections librarian will, normally speaking, not find.

By and large, special collections personnel can aspire to head a special collections department or perhaps to direct an independent research library which is nothing but a special collection. Even these positions may turn out to be, in effect, reserved for nonlibrarians and scholars such as those who direct the fortunes of several independent libraries—e.g., Huntington, Newberry, or Pierpont Morgan—or departmental special collections (such as Bancroft or Beinecke). Memory of the dragons may not be as significant in such appointments as is the sense which search committees seem to share, rightly or wrongly, of the relative prestige of a librarian and a scholar (and the distinction between the two) and their impression of the typical librarian's lack of entrepreneurial skills and academic contacts. The implications of such appointments on the prospects for upward mobility of rare book librarians make such a guess of academic interest only.

In any case, if advancement to senior administrative positions within special collections is difficult for special collections librarians who cannot also present themselves as scholars, then advancement to senior administrative positions in general libraries (the sort of advancement for which their nonspecial collections colleagues can work and hope) is more difficult still. Perhaps their colleagues regard rare book personnel not only as dragons but also as being too much scholars to be entrusted with the complex and dirty burdens of advanced administration.

Nonetheless, not all, perhaps not even many, special collections librarians aspire to senior administrative positions or directorships. Oriented more powerfully than many of their nonrare book colleagues toward the physical book, they are frequently concerned with maintaining close contacts with books, collections, and readers. Similar concerns, of course, are expressed by other librarians caught moving into upper administrative positions. Rare book personnel, whether by virtue of self-motivated choice or externally-limited opportunity, tend to manifest such concerns most convincingly by staying close to their books and readers. When they seek to advance—and raises tied to promotions are no less important to rare book personnel than to anyone else—they tend to look for advancement within the field.

They may seek to rise within a single institution (usually a tedious process) or by jumping upward from library to library, but generally they stay in special collections. A person who starts off cataloging
manuscripts in a modern manuscripts collection may move into acquisitions, then take on curatorial responsibility for the subject field of the manuscripts he or she has cataloged and acquired, and thus become reacquainted with printed books, and eventually take administrative responsibility for the entire rare book and manuscript department. Or a person may start off as a temporary cataloger for an ongoing special collections-related bibliographical project (such as the Eighteenth Century Short Title Catalogue or European Americana), move to an entry-level position in reference at a small research library's rare book room, proceed to directing all public services at a large university special collections department, and wind up the director of a similar department at another university or major public collection.

The promotion and advancement process is normally slow. People may stay in one position for three, five, ten, or more years awaiting a promotion possibility at home or elsewhere. Few libraries (Brown and Columbia are notable exceptions) advance the rank of people who remain in the same job improving their expertise. The advancement process may be slow, but such apparent immobility can advance a career nonetheless by providing the librarian with the opportunity of learning to do with increasing proficiency some of the tasks that rare book librarianship demands. This is far from wasted time. Special collections do ultimately require both subject and technical proficiencies, and the more time one spends with a collection and its users, the more one can learn of both. Increased expertise is likely to have a cumulative impact on performance, supervisors' evaluations, and eventual promotion or hireability.

Career Paths for Special Collections Librarians

How the new special collections librarian starts out a career will, as is already clear, depend significantly on the kind of institution with which he or she first affiliates and on the kind of position within that institution which he or she accepts.

But other factors also influence the shape of a career. They may most immediately have an important effect on the kind of first position a new special collections librarian gets. Does she hold a subject doctorate? If so, is it in a field relevant to an institution's collections? Or is it merely a credential which the institution admires but which will not prove directly applicable to interpretation of its holdings? Has she worked in the antiquarian book trade? Is he transferring from another position elsewhere in the library, or perhaps from the faculty, because of appropriate credentials for work with older books and manuscript and
an interest in them? Or is he making this transfer because he is perceived as a misfit and senior library or academic administrators hope that his peculiarities will do the least harm in their institution's lightly-regarded special collections department? Is the collection established? Or is it a mass of materials which need organization and definition? Is it staffed so that one person does everything? Or does it have a large staff with distinct areas of responsibility?

The variables which affect the shape of a person's career do not lessen in number once that person has found a first position of whatever sort. The people with whom one works will make a major difference. If they share their knowledge (if they have any knowledge to share) and if they act as mentors (if their advice is any good), then their impact will be helpful. If they are neither knowledgeable nor sources of good advice, but generally pleasant, then they may at least make a first job seem like a welcoming experience. Alternative possibilities do, unhappily, suggest themselves.

A person may choose to work with external organizations, such as the Rare Books and Manuscripts Section of ACRL, RTSD, the American Printing History Association, Society of American Archivists, the Manuscript Society, or local book-collecting or private printing organizations, and thus improve his or her visibility in the field. Such visibility may do little to enhance promotability at home but serve nonetheless to make a person seem attractive, because he or she is active, to hiring personnel at other libraries. Clearly a library's ability or willingness to help support staff professional activities will influence the activities one undertakes.

Or a person may publish. The appropriate background may result in publication in a traditional academic discipline. A person who produces articles, monographs, scholarly editions of primary texts, or edited collections of essays, normally improves his or her opportunities for advancement. A person may publish on bibliographical topics, whether related to his or her institution's collections or not. A person may publish on matters relevant to librarianship. He or she may try to become a reviewer of new books for Choice, for The Papers of the Bibliographical Society of America, or for the local newspaper. Publication will generally influence promotability favorably both at home and abroad. But some library hiring committees may be more impressed by "scholarly" publication, others by "library" publication—if they think that such a distinction means anything.

Public speaking, before local literary or book-collecting societies, before regional or national library organizations, or before scholarly groups, may be a possibility. Such an activity is likely to be most effective in advancing a career when it is clearly an extension of an active
publication record. Without being accompanied by publication, its effect on a person's career is likely to be mixed. Many library administrators still regard public speaking as a traditional outreach effort which merits no special recognition.

Both publication and active public speaking, however, depend on a person's having time to pursue such activities. This author has written elsewhere about the difficulties that special collections librarians face when they seek to find such time. It remains true that a very small percentage of people active in the field at any level publishes anything at all. One sees little likelihood of change in this respect. It is hard to know what the impact of this situation is likely to be. It may, on the one hand, make the record of those who do publish or speak frequently seem even more impressive to hiring and promotion committees than is true now. On the other hand, it may make such activities appear less relevant to the job and therefore less significant criteria of promotability or hireability than they are at present. As increasing emphasis is placed on managerial skills as opposed to scholarly competence, this second possibility is likely to prevail.

Some institutions may offer opportunities for a person to teach. Courses may vary from formal instruction in a history department or library school (history of books and printing) to informal courses in the evening (collecting rare books for beginners). In a library that regards as important the sort of outreach which teaching permits, this activity too may influence one's chances for advancement.

A person may take an opportunity to add a subject master's degree or a doctorate. Such a credential may not, strictly speaking, be necessarily related to the job one is doing or to the job one would like to be promoted to, but its possession frequently has an impact on promotion or hiring committees within and without the institution, other factors being equal (as they sometimes are). Degrees make a difference, as has already been noted, in appointments to directorships at independent research libraries. They also appear significant in the choices of search committees seeking to find directors for university rare book departments. Appointments made during the 1980s to head special collections at, for examples, Delaware, Harvard, Maryland, North Carolina, Pennsylvania, Princeton, and Stanford all went to people who hold Ph.D.s, usually in conjunction with traditional library credentials.

And of course one may seek opportunities to work within one's own institution at duties outside the sphere of the special collections department alone. Larger libraries especially are prone to have committees. These committees may deal with just about any conceivable question: finding appropriate furniture for computer workstations; library
development projects; exhibitions; and transition to new online databases. Rare book personnel frequently find themselves, willy-nilly, involved with their institution's friends-of-the-library group and, if they exhibit success in increasing the support which such a group provides the library, their promotability is likely to be enhanced. The special collections librarian whose work with internal committees, projects, or support groups impresses colleagues and supervisors is clearly in a better position to receive advancement opportunities within the organization than one who engages in no such work at all.

It may not be inappropriate to remark that it also helps to do one's job reasonably well. Some administrators take competence for granted. Others, mirabile dictu, notice it. But everyone notices incompetence sooner or later.

How a person performs his or her job, as well as the various other activities that a special collections librarian can pursue, is likely, at least in theory, to have an impact on the shape of a career. Competence in any one branch of the field is not, however, a guarantee of upward mobility into another branch. A talented rare book cataloger may or may not be encouraged to move into a supervisory position that involves, for instance, curatorial responsibility for a subject collection or general acquisitions. The effective reader services librarian may or may not be excluded from supervision of the rare book cataloging staff.

Moreover, institutions vary in how they can respond even to the best of librarians who are also visibly active and highly regarded in a variety of related organizations or who publish. One library may be unionized or otherwise so hierarchically structured that promotion is a slow, lockstep process irrespective of personal qualifications and demonstrated abilities. Another may be so small that there is no place to go within special collections in that library. One cannot be promoted but must instead leave the institution. Or leave special collections if, in that institution, there is no such prejudice as has been discussed earlier against moving rare book and manuscript personnel into other areas of the library. Or wait for a supervisor to cross a busy street carelessly.

How and where one moves will be determined by at least as many variables as have already been discussed. The special collections market is far more restricted than the market for some other fields of librarianship. A collection development librarian, a subject bibliographer, a reference librarian, or an acquisitions librarian is not likely to encounter many libraries without some needs in these areas. Systems librarians are eagerly sought. A person who has overseen OCLC, RLG, NOTIS, or Geac transitions at one institution may be sought by others, perhaps at increased levels of overall responsibility. But not all libraries maintain
special collections operations, nor are all such operations entirely comparable to one another.

The person who seeks to leave a small, highly specialized collection in botany or an archive specializing in film history may not seem obviously attractive to hiring personnel seeking to staff a general rare book collection in a large university. Another who has worked for regional historical societies may easily make the transition to a genealogical society library elsewhere in the country but seem entirely inappropriate for the staff of a collection which specializes in private press books and modern literary manuscripts and first editions. An incunabulist from a collection rich in early printed books may find it difficult to convince the directors of a library with strong Civil War and American history collections that general special collections expertise is transferable.

The degree to which one has developed subject expertise in a field may also influence potential advancement. A person who has worked in a medical history collection or one with a strong emphasis on English and American literature, and who has become active in the scholarly and library communities associated with these subjects, may find it difficult to convince hiring committees that his or her library skills outweigh apparent subject specialization. Equally obviously, the person who has worked in a general collection may find it difficult to move to a highly specialized collection, particularly if its specialty was unrepresented in the collection with which he or she had been working. The lack of subject specialization may be as troublesome as its presence.

Still and all, people do move. They tend, generally speaking, to move within roughly comparable kinds of libraries. People whose careers begin in small regional historical societies do not easily wind up in special collections at large university general rare book collections, and vice versa, without strong subject competencies related to the needs of the other institution. But a person who has worked in a small college rare book library may not find it difficult to move to a larger university's rare book library. And people at large libraries may find opportunities for advancement at small, mid-size, or other large libraries of the same general sort.

Ultimately, however, movement tends to stop at the department head level. Some libraries may define that position differently from others. In large university libraries, the head of rare books may be an assistant or associate university librarian. Yet it remains uncommon, though it is not unheard of, for such personnel, despite their rank, to be active members of the library's management team. Their opportunities for movement into the broader and upper administrative reaches of their
Of course there are some library directors whose early careers included a stay in rare books. The late Hugh Atkinson worked in the rare book collection at Chicago (but he was a student at the time); David Stam worked in special collections at The New York Public Library (but he was an intern at the time). Strikingly few library directors come from careers in special collections. Library directors whose careers have been spent largely in special collections direct special collections libraries.

One ARL library director has recently predicted (privately) that this situation might be about to change. It has not begun to change yet. The special collections librarian who thinks of work in special collections as the first stage of an ultimately more richly variegated career ought to think again. Unless one moves out of special collections relatively quickly, a person is likely to be typecast for his or her entire professional career. Fortunately, most special collections librarians do not seem to find this prospect dispiriting.

Conservators and Conservation Administrators

One subspecialty deserves separate mention in this connection. Growing concern with the preservation and conservation of library resources has provided an impetus for the introduction into many libraries of new kinds of professionals—conservators and conservation administrators. Effective performance of duties either as a hands-on conservator or as the administrator of a conservation program requires considerable training or experience beyond what most special collections librarians receive during their education. Although closely allied with, and, perhaps, supervised by, special collections personnel, such professionals often have library-wide responsibilities requiring a maturity that the years that go into their experience and training may help them to achieve. Conservators treat materials both within and outside special collections, although they will usually do both with considerable input from that department's staff. Conservation administrators may emerge from a special collections background but must interact with staff throughout the library in planning for the care of materials in a manner which balances the needs of the entire system. These professionals are therefore not quite so closed off from the rest of the system as the special collections staff itself.

Personnel in this field do not normally work with readers but with other librarians. While they may have certain affinities for their col-
leagues in special collections, from another point of view they are more closely analogous to other technical services personnel. Their work gives them one kind of overview of library-wide issues, just as catalogers or acquisitions staff have to develop such an overview to do their jobs well.

The field is still new enough so that it is far too early to guess at the eventual upward mobility of conservation-oriented professionals. This author is aware of one special collections library—a departmental library at a large university—whose assistant director comes from a conservation background. Some other conservation administrators may also be at the early stages of a transition into general library administration; one now already serves as director of a small university library. The career paths of professional librarians in this specialty seem likely eventually to become similar to those of nonspecial collections librarians. At present, however, this possibility can only be proposed very tentatively.

Balancing Access and Preservation

Nothing has been said about the working conditions which special collections librarians can expect to encounter. A recent essay considers this aspect of the job in greater detail than can be duplicated here (see the author’s “The Rare Book Librarian’s Day.” Rare Books & Manuscripts Librarianship 1[Fall 1986]:93-105). The physical isolation of special collections personnel from their colleagues elsewhere in their libraries is often matched by feelings of intellectual isolation from colleagues in other kinds of librarianship.

The desire, which has been suggested is increasingly characteristic of contemporary rare book and manuscript librarians, to cooperate with and function in harmony with their nonspecial collections colleagues is frequently frustrated by their exclusion from upper management. This exclusion is only a natural consequence of the barriers which physical isolation can easily create. But their intellectual isolation is even less easily bridged than the physical. For there is at least one major distinction in outlook between special collections personnel and their colleagues that keeps even nondragon modern rare book professionals from complete identification with the goals of their colleagues. Modern American librarianship emphasizes almost above all else access—access to books, access to manuscripts, access to information, access that is unimpeded and free. The special collections librarian is not immune to this value and shares it. But he or she is also brought up to feel that, however significant access is as a value, it must always be balanced
Profession of Rare Book Librarianship

against the value of caring for, protecting, and preserving the \textit{physical objects} which special collections contain. When the two values collide, as they often do, it is no easy matter for the special collections professional to determine where the lines ought to be drawn.

In libraries which measure success by circulation statistics, as some explicitly and many implicitly do, this conflict can rarely be understood or appreciated by colleagues or administrators. It creates a tension in the relation of special collections personnel to their colleagues that seems irremediable, though how serious the friction that emerges out of such tensions proves to be will vary from library to library as the personalities of librarians vary and as special collections personnel succeed in articulating the basis of their concerns. Moreover, as conservation ceases to be the province of special collections personnel only but increasingly attracts the attention of general library personnel and administrators, what had been a source of friction may yet prove to be a source of increased contact and improved mutual understanding.

\textbf{Conclusion}

This article began by suggesting that the profession of rare books librarianship is not so terribly different from the profession of librarianship generally. Special collections libraries differ from one another just as general libraries do. Special collections librarians have diverse career paths just as general librarians have. These views are truths, even though, as the rest of this essay suggests, they are not whole truths.

It is hard to generalize about the profession of rare books librarianship in the 1980s because the profession is in flux. The transition from the entrepreneurial collection builder to the collection manager is still underway (collection management itself need not be entirely divorced from an entrepreneurial sensibility—some managers, after all, acquire more support for their managerial responsibilities, both from internal and external funders, than others). The relatively recent emergence of the conservator and the conservation administrator as a force within both special collections and the larger library world, and as a potential bridge between the two, has long-range implications which have hardly begun to be felt.

The field of special collections is changing, and it is changing rapidly. Nothing is surprising about this flux; it characterizes librarianship as a whole in our time, and it is only to be expected that it should also characterize a branch of librarianship which has been self-consciously distinctive for so brief a period of time. The experience of a career in rare books is likely to be dissimilar in detail for all of those who
engage in it at such a time of change. There will be a great deal of running around, some of it in no particular direction at all.

But the purpose of such a caucus-race (as Carroll's Dodo suggests) is to define its own meaning. Definition of the purpose of special collections, of their relationship to other library collections, and to the research, reading, and information functions which libraries exist to serve, is not such a bad race in which to run.

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Reference

Rare Books in University Libraries

STEPHEN FERGUSON

Introduction

It has been thirty years since Library Trends devoted an entire issue to rare book librarianship. During those years much change has indeed occurred. This article on rare books in universities is the sequel to the article under the same title written by Cecil Byrd of Indiana University and published in the April 1957 Library Trends. In the article, Byrd summarized the results of the nineteen questionnaires that were returned to him from various libraries. It appears from the text that these libraries were Brown, California, UCLA, Chicago, Columbia, Cornell, Duke, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Kansas, Kentucky, Michigan, Minnesota, North Carolina, Ohio State, Princeton, Texas, Virginia, and Yale, as well as some others such as the Clements Library and the John Carter Brown Library. The article is chiefly a "group portrait," giving a "slice through time" or stop-action view of operations, acquisitions, and policies for use of these various units in 1956-57. Unlike Byrd, this author's intention is not to present the reader with a composite picture of these libraries thirty years later but rather to focus on rare book librarianship at universities in the 1980s. Many functions of rare book libraries are indeed classic and will remain so as long as the idea of the university is maintained. Such classic functions are well spelled out in the April 1957 issue of Library Trends (see pages 418 and 419). This author's attention will not be so much on such matters as changes in acquisition policies or the particulars of

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budgeting and expenditures. Mainly, it is hoped that the focus will be on the ideas and social forces shaping these libraries. As well, this author is interested in how people have responded to and used these ideas and forces.

**Trends in Rare Book Librarianship**

The following is a summary of ideas that will be covered in more detail. First, the classic functions of rare books in university libraries have been supported on a continuous basis. This is in contrast to rare book collections in public libraries or in independent research libraries which are suffering today because of lack of resources.

Second, over the past thirty years, university libraries in general have taken on the traditional concerns of rare book and special collections. The reasons in brief are: converging similarities in physical characteristics of materials; need and urgency for security of materials; need and urgency to supply specialized services for restricted materials; and regulated use as a means of providing service. One major development signaling this trend is that nowadays knowledge, concern, and action for the preservation and conservation of library materials are no longer the exclusive province of special collections librarians. A special interest has now become a general interest just as concern for the ecology of the earth is no longer confined to "nature lovers."

Third, another convergence is in the area of orchestrating the specialized and diverse forces useful for the interests of the rare book and special collection. Rare book librarians today are more than ever aware of the utility of teamwork within the library and the need to utilize specialists outside the library.

Fourth, there has been a change in the leadership of rare book units. Compared to the situation described in *Library Trends* by T.R. Adams in 1957, the leadership is now coming from within the profession, not from outside it.

Fifth, despite evidence of convergences at hand, there are equally strong cross-currents pitting the interests of special collections librarians against those of general, academic librarians. It is a difference of point of view and assumptions about library materials and services. This author characterizes this conflict as "Amory's paradox," namely a world in which there is "more and more information and less and less evidence."
Support of Classic Functions

Since the university is in essence an idea which can only be known through its physical expression, schools have long sought to appropriate surroundings expressive of the ideology of education, namely, that education is to be carried out in an enclave where knowledge and truth can be pursued without interference. Universities seek to be a place apart from the hurly-burly of everyday life; a place for reflection and self-improvement not unlike the Church. Examples of such physical appropriations can easily be listed. Most noticeable is the imitation Gothic architecture embraced by North American colleges and universities from the 1850s to the 1940s, at a time when it was not the dominant style of building form. Similarly, in the course of pursuing its goal of physical separation from the rest of the world, one of the uses made of special collections by a university is to house such collections in exalted quarters. Over the past thirty years, a number of universities have set up new or renovated facilities for special collections all in compliance with this ideal. Yale built the Beinecke Library; Indiana, the Lilly; Texas, the Harry Ransom Humanities Research Center; Toronto, the Thomas Fisher Rare Book Library, and so on. All are grand and bibliothecal. In the year 1985 alone, renovations were carried out at the following facilities:

At Northwestern University, special collections was fitted with a comprehensive environmental control system for the stacks of the unit. The work involved six months of planning and six months of refurbishment with renovations covered by a $750,000 foundation grant. Rutgers opened a new exhibition gallery—Gallery '50—in June of 1985 with funds given by the Class of 1950 and the National Endowment for the Humanities. At the University of Texas, Austin, the exhibition gallery for special collections in the Academic Library was renovated during 1985. Princeton University added the Milberg Gallery for the Graphic Arts to its special collections facilities in Firestone Library. Columbia University Libraries opened a new rare book and manuscript facility on the sixth floor of Butler Library built at a cost of over $3 million. Officially opened on December 6, 1984, the facility included a new exhibition gallery, unified areas for readers of rare books and manuscripts, climate controlled stack space, and other needed facilities. At Yale, major renovations to fire detection and suppression systems were made at the Beinecke. At Stanford, the former Bender Room, which once housed Special Collections, was refurbished for University Archives.
In addition to buildings, collections have been built as well; details of these events are well covered by Gordon Ray and William Matheson.

In three influential papers written over a period of almost 20 years, Gordon Ray summarized the principal characteristics of the rare book world in the 1960s, 1970s, and 1980s. In his first article in the *Papers of the Bibliographical Society of America* (Second Quarter, 1965), Ray found that institutional libraries were the dominant purchasers of rare books and manuscripts, setting the pace for the market. By the time Ray published "The World of Rare Books Re-examined" in the *Yale University Library Gazette* (July, 1974), the affluence of the 1960s had gone and institutional involvement in the rare book world had markedly diminished....In a 1982 address to the Fellows of the Pierpont Morgan Library, *The Rare Book World Today* (New York: Pierpont Morgan Library, 1982), Ray found that rare book collections that were part of university libraries were in a particularly poor position....As will become clear, I got responses that documented the picture of hard times, especially in staffing...[but] I also received a good many other letters painting a much rosier picture....A good number of other libraries described institutional support that has permitted purchasing to move ahead energetically.³

**Convergences**

Research libraries are becoming more and more restrictive regarding the conditions for use of their collections. The reasons for this action are many. First, the cost of ordinary books and journals has gone up considerably in the 1970s and 1980s, hence, more and more money is being put into keeping the collections at the levels of strength to which the library is accustomed. Second, costs of books and journals are not respecters of persons, so individuals are suffering the same difficulties and in some cases relieve such by permanently borrowing the library's copy because they cannot afford their own. The library must replace the copy at a higher cost than that of the original copy. Thus more money invested in the daily growth of the collections gives rise to more vigilance over their safeguard. Simultaneously, the library's established collections, those dating from the nineteenth and early twentieth centuries, both deteriorate because of acidic paper and become more and more difficult to replace as the second-hand book market which might supply replacement copies becomes exhausted. These factors plus several others have caused libraries to take on features of the noncirculating rare book library. Access is restricted; stacks are closed; materials once in the open stacks are transferred to nonpublic areas. One of the results of this trend is pressure on rare book librarians to take on security officer duties regarding such now "endangered" books. Because of the tradi-
tional role of the rare book librarian as custodian, he or she is looked to immediately as the one to care for these new classes of books at risk. One result of such pressure is the crowding out of time for curatorial and scholarly service. Noting this misuse of staff and time, some libraries, such as the Library of Congress, have established a "medium rare collection," which presumably protects the book from ordinary conditions of use but does not move them to a facility where more elaborate security and services are provided such as the rare book reading room.

Moreover, this trend toward restriction is not likely to go away, as two experts have pointed out. Richard DeGennaro says that in the future users will still go to libraries in order to find materials that are not available elsewhere or that they cannot afford, while Michael Buckland maintains that libraries are virtually the only place where one can find old books.

So the amount of material now scheduled for restriction is growing and will continue to grow. Because restricting access and controlling the conditions of use of books is difficult, time-consuming, and costly, new interest in the preservation of materials has arisen in recent years. Such knowledge was once almost the exclusive province of rare book librarians. Nowadays it is part of the mainstream of research library administration. Examples of this change are easily brought to hand; one need only look at the Fall 1981 issue of Library Trends, "Conservation of Library Materials," for evidence.

Teamwork and Specialists

Another area of change in rare book curatorship over the past thirty years has been an increased understanding of "team work." Passing into oblivion is the image of the "Lone Ranger" curator sitting in his office handling each volume once daily and absorbing mystically all manner of knowledge about booklore, important and trivial. Collections have grown in size and complexity to the point that the curator is usually not the only one serving them; he or she must have assistants and, usually, curatorial colleagues in the library as well. Consequently, time once devoted to intensive study of the objects must be turned toward working with other people. The reasons for this are several, in addition to the one stated earlier. Today there is more emphasis on teamwork in organizations. It is simply the lifestyle of the time. In many fields, leaders are no longer simply leaders but "change masters." The metaphor of leadership has shifted from the image of the individual at the head of the group to that of the operator controlling the system. By the same token,
the image of "followership" has changed. The follower now participates in the leadership (hence "teamwork") rather than being subordinate to it.

In educational circles, a similar change in the image of leadership seems to have occurred. In a former day, excellence was considered in terms of each person finding the truth by his or her own light. Under such an assumption the institution was encumbered to provide separate arrangements for each individual's pursuit of excellence. Thus each faculty got its own building, its own seminar rooms, its own libraries, and so on. As Buckland observed: "[The] extreme of this can be seen in some Austrian and West German universities in the allocation of resources for library services to separate 'libraries' for each institute, with each professor (i.e. 'ordinarius' and 'full' professor) having his or her own institute."6

But such particularity today is simply too costly; society no longer seems to have the resources for separate arrangements. Today the model for excellence in education is provided by the group—the scientific research team being the paradigm example. It is for these needs that the institution arranges its resources today.

This mood now permeates libraries in universities, of course, and has dramatically changed the character of the curator's work. There are committees to attend, memoranda to read and to write, telephone calls to make and to return, and the like. Many times the teamwork creates mutual understanding between staff. But on the other hand it is sometimes ineffective. So much so that one special collections department head said recently, in reference to his relations with other departmental heads in the library: "There can never be enough communication or education."

In addition to the teamwork with colleagues now necessary in the university library, the curator today is enlisting the services of specialists outside the library in order to accomplish the tasks at hand. These people include:

—Book and paper conservators
—Computer professionals
—Printing and publishing experts
—Exhibit preparation experts
—Granting agency personnel
—Professional fund raisers (both within and outside the university)
—Public relations specialists (e.g., Princeton’s Communications Office)
Rare Books in University Libraries

—Facilities experts, such as architects, security system vendors, engineers
—Library school educators
—Lawyers
—Better educated, more professionalized rare book sellers
—Photographers
—Police agents specializing in art and book thefts
—Bank officers
—Library network personnel

Some members of this list have skills that were unavailable thirty years ago.

Leadership

In the April 1957 issue of Library Trends, T.R. Adams noted:

[At some] university libraries,...the faculty, which exerts a substantial influence in the selection of the librarians, still feels that the library profession is not a dependable source of men to hold their top library posts. Of the six university libraries of over two million volumes, three are headed by men with no library science degrees and two of these came to their jobs with no previous library experience. Indeed, of the five men appointed since July 1, 1955, to head libraries included [among the larger academic libraries], four are without library degrees and three without previous experience. Adams notes a similar situation among leaders of rare book libraries and special collections.

The professional background of the men and women who have been put at the head of these new [rare book] operations is also significant. Two-thirds have a professional library background including a library degree, although a number have some kind of scholarly or antiquarian book training in addition. It should be noted, however, that major eastern institutions such as Harvard, Yale, Princeton, Columbia, and Virginia, and one west of the Alleghenies, Indiana, have heads who came to rare book librarianship from backgrounds of research, bibliography, or the antiquarian book trade. Adams attributes this leadership situation to the fact that there is a "dichotomy between librarians and scholars...[in] American librarianship." Many times in the past, the scholars found that the librarians hampered their work and, since the scholars were in a position to influence governance of the library, they wanted someone with their
own interest at heart to be in charge. Take, for example, these findings summarized by Barbara B. Moran:

Library directors now are chosen primarily for their demonstrated managerial competence and leadership. A recent study compared ARL directors in 1981 to the directors of the same libraries in 1966 and found some interesting differences between the two groups. In 1966, 15 percent of the directors lacked library degrees, but by 1982, every ARL director had an earned graduate library degree. "The genteel, scholarly, even dilettantish directors of the past are yielding to career-minded managers, administrators, and technicians."

And in the area of special collections leadership, the trend has been reversed as well. The bookman at the head of the rare book unit is a vanishing species. The book expert is now a staff position. Today's leader is chosen from national ranks, usually, and the choice is commonly made on the basis of two considerations: academic credentials and experience in libraries, including their ability to obtain grants. A review of Adams's six institutions today reveals a different pattern. The backgrounds of the heads include archival administration, library computer networking, and rare book librarianship.

Today the choice among administrators is not between scholars and librarians. It focuses on the person's ability to administer the whole, that is the entire conglomerate making up special collections, as opposed to the part, namely, a subsection of the unit. The candidates for the top positions must be able to demonstrate that they can do more than a particular special activity. Moreover, the selectors usually cannot decide which specialty is adequate preparation for the lead job. Consequently, the library directors of the major academic libraries in the United States were usually directors somewhere else before arriving at their present job. The same pattern is beginning to emerge among special collections administrators.

There is speculation about the cause of this trend. There is still in universities the idea that the library is one agency with one head agent. (In point of fact, this notion is debatable; it can be easily argued that it is many agencies and consequently should have many head agents.) Nonetheless, the notion of the unity of the library lives on and, because of that, central university administrations require a head librarian to be at the front. This requirement in turn necessitates that the means of control remain within the reach of one person. Concurrent with this habit of administration are the ever increasing scope, power, and complexities of the facilities and staff in the library. The two forces (the administrator and those administered) live in tension as the former tries to contain the latter. To resolve the tension, the administrator has
several choices—more resources for control, improved use of current resources, or laissez-faire. Because of several factors, the administrator does not usually get more resources, and laissez-faire is not acceptable. As a result, the only choice is to improve use of present resources and that is done through changing regulation of current resources. Library economy today means consolidation of facilities and networking, thus ending separate arrangements for various collections or forms of materials. Reading rooms are being combined; automation of cataloging makes interconnections easier. The trend is toward integration of the various particular special collections rather than decentralization. Only one who can oversee and manage the whole can do this.

Cross Currents

In this era of emphasis on team work, the specialized nature of special collections work seems to become more and more separated from the mainstream of library work. Because curators deal mainly with objects as opposed to information, it makes it harder for them to relate to the theory that binds together their other library colleagues many of whom think of themselves as “information professionals.” As the head librarian of Columbia University said recently: “Librarians don’t organize books, they organize knowledge and ways to gain access to that knowledge.”

To many academic librarians, the form of the information is irrelevant to its apprehension and use by the individual. For them, what they are dealing with is as abstract as the concept of “money.” Information can be measured out in shelf feet, film rolls, or pages, just as money can be dealt with in cents, yen, or “Eurodollars.”

Hence, for “information professionals,” preservation of library materials becomes a matter of saving “the intellectual content.” This latter concept is usually taken to be something everyone takes for granted, namely, the words on the page.

Intellectual content is not a self-evident concept; it is a judgment made by a human being. The notion of intellectual content is obviously derived from the commonsense distinction between form and substance. Moreover, this distinction is one that democratic society generally accepts and the librarian, as a member of such a society, accepts it as well. In other words, consider society to be a group of people acting out a script which they hope will sustain their lives together. Obviously each person has a proper role to play, a role dictated by an agreed upon “script.” One presumption of the script is that the librarian is to serve as a societal memory and to create, store, and recover vital facts as needed.
by society as it plays out the script. Moreover, the librarian should work in balance with other players so that their life together is “fair” and the relationships are “just.” The pressures to play the role strictly and without “ad-libbing” are strong. Conformity to the role is vital to the interests of all.

In this context then the librarian today considers the immediate tasks at hand. Since nature is as always at war with human artifacts, a decision must be made about how and what materials one can preserve for society. So, in reaching the larger decision, the written record is viewed in all its aspects, but only one aspect is viewed to be useful—that is, useful to the democratic society, useful to the largest number of people, useful in the most immediate ways. That usefulness is called “intellectual content” and when it is preserved the book is sometimes destroyed.

On the other hand, one of the chief changes of recent years is that rare book librarians have come to recognize an intellectual framework for their endeavors that crosses the physical boundaries of the library and crosses academic disciplines as well. Rare book librarians have all recognized that they play a role in the larger pursuits of bibliography—that is, bibliography in the old-fashioned, fundamental sense as a discipline concerned primarily with the transmission of texts. Because of new thinking about the nature of human intellection and its artifacts, such as books, rare book librarians have now come to see that there is an expanded meaning to bibliographic work—one having to do with the transmission of the ideas in society. This author is referring to what is nowadays called the history of the book. It is a field that is still developing but destined to stand on its own in the near future as an established field along with art history and the history of science. Lawrence Wroth developed this point as well:

The fact that a not too important book is found in a gorgeous and truly notable binding may mean little, but it may mean a good deal to a reader who encounters a note concerning it. The circumstance that a Venetian book of 1504 with an important American reference is found in a contemporary German binding tells the reflective scholar something about the dissemination of information in Europe of that period and thus becomes a small element in the history of ideas. A seventeenth-century European book attacking witchcraft inscribed by its author to an American opponent of the great delusion may in that very copy have been an element in the advance of man from darkness to light.

Hand in hand with this new understanding of the book—as an agent in the transfer of ideas and in the development of the mentalities of various peoples—is the understanding of the book as an artifact. As such, it
Rare Books in University Libraries

plays a role in the material culture of a society. Jules Prown of Yale has
developed this concept well in an article published in the 1982 Winter-
thur Portfolio. Material culture is “the study of culture through artifacts...
...is based on the obvious fact that the existence of a man-made
object is concrete evidence of the presence of a human intelligence
operating at the time of fabrication [and use].” He develops his exposi-
tion of material culture in great detail and, among other points,
oberves that “the most obvious cultural belief associated with material
objects has to do with value.” Such a statement immediately brings to
mind the studies of two scholars focusing on this very point regarding
books especially Bertrand Harris Bronson’s “Printing as an Index of
Taste.”

Equally germane to considerations of value is the following. If one
did not know books directly, if one only knew them through the inter-
mediary of Xerox, photostat, microfilm, videodisk, and the like, how
could one fully understand the joyfulness and pleasure that past genera-
tions had when they held and read a book in their hands? Or, how could
one fully appreciate this famous epitaph without ever handling an
original book?

The Body/ of BENJAMIN FRANKLIN, Printer,/ (Like the cover of
an old book,/ Its contents torn out And stript of its lettering and
gilding,)/ Lies food for worms:/ Yet the work itself shall not be lost,/ for it will (as he believed) appear once more,/ In a new/ And more
beautiful edition,/ Corrected and amended/ by/ The Author.

One cannot intuit another reader’s response to the book without han-
dling the original. Moreover, when one sees and uses a reproduction, the
only response one knows is one’s own response. Wroth concludes:
“Only when these and similar investigations have been made and their
results recorded can the librarian put the book in its place upon the
shelves with the feeling that to the best of his ability and knowledge his
library is prepared to say that it is carrying out its function of giving its
clientele information, enlightenment, and delight.”

Clearly, a thorough understanding of the objectives and methods of
two disciplines—the history of the book and the study of material
culture—have given rare book librarians theoretical underpinnings for
their day to day handling of rare books.

Over against the attitudes of the “information professional” are
those of the curator, one who must care for the object as such. From his
or her point of view, “intellectual content” is the object itself and not
some replication of the object. To the curator, preservation conse-
quently means conservation—that is, keeping the object as itself for as
long as possible. All this leads to what this author calls “Amory’s
dilemma." In a review and letter ably proclaiming the importance of the book as a material object, Harvard's chief rare book cataloger Hugh Amory states: "We advance toward these dazzling heights [of "the information age"] like doomed heroes, more and more information and less and less evidence."19

What is common ground for the points of view of the "information professional" and the curator? As in the past, it is hoped that it will continue to be within the enclave of the university.

References

6. Ibid., pp. 133-34.
8. Ibid., p. 431.
9. Ibid., p. 432.
15. Ibid., p. 3.
17. Another example of the deprivation induced by handling only reproductions is shown in the following example. It is told recently that a college student, so accustomed to school texts, upon seeing a copy of the first Shakespeare folio, said: "Where are the footnotes?"
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The Subtle Symbiosis: Rare Books and Manuscripts at Mills College

MARTIN ANTONETTI

It is fitting that we discuss the character and activities of rare book and manuscript collections in college libraries as distinct from those in university and public libraries, for, in general, special collections departments in college libraries operate in an altogether different mode and exist for different reasons from their counterparts in other institutions. First, the collections tend to be of three basic types: (1) a broad selection of representative books and manuscripts drawn from many subject areas, from different countries, and from various centuries, and usually containing "high spots" from the history of printing; (2) one or more narrowly defined and sharply focused subject collections, such as the Margery Bailey Renaissance Collection at Southern Oregon State College (which, in many instances because of their depth and the quality of their holdings, can be classed as primary research collections of importance)—these may or may not have any relation to one another and are often developed as separate entities; or (3) a combination of the two.

Second, these collections tend to be used by two major groups: (1) the students of the college for whom the broad, general rare books and manuscripts collection acts as an adjunct to the curriculum; and (2) scholars, either those affiliated with the college or those from other institutions who are doing original research. And third, although the special collections department in a college environment superficially seems to share some of the organizational patterns of its counterpart in the university setting, there are divergencies in their objectives which

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give it a wholly distinct quality. What follows will attempt to define the
special nature of rare book and manuscript collections in college librar-
ies by highlighting and analyzing these differences.

This necessarily panoramic overview will focus on Mills College in
Oakland, California, since its special collections department is in many
respects quite typical but in other respects quite uncommon. Mills is a
small (just under 1000 undergraduate and about 200 graduate students),
private, liberal arts college for women with strong programs in fine and
performing arts, mathematics, English, and computer science.

Rare Books and Manuscripts Come to Mills

In general, but with some noteworthy exceptions, the genesis of
special collections in college libraries in this country, especially in the
western states, was for the most part due not to well conceived plans
formulated early on by committees of librarians and faculty but rather to
an unexpected donor or a felicitous conjunction of events. That chance
(not intent) seems to have played an important role at Mills College or at
similar small liberal arts colleges in no way implies that the librarians
in charge lacked foresight or were insensitive to the intellectual require-
m ents of the parent institution. The infant libraries were preoccupied
with concerns and challenges of a sort that precluded interest in what
must have seemed a frivolous waste of time. The basic tasks of acquiring
books to support the curriculum, and then cataloging them, were
certainly enough to keep a small and perhaps undertrained staff busy
enough. Nonetheless, unusual materials did find their way into these
libraries and were met with an ambivalent response—in most cases they
were cataloged—just like ordinary books—and then closeted.

In 1919 a San Francisco insurance agent by the name of Albert M.
Bender made a gift of six books to the Mills College library.³ It was a
modest enough donation but it had an impact on the college quite
disproportionate to its value, for these books were the first to come to the
library burdened with the appellation rare. No doubt some of the
material already in the library's circulating collection could have been
(or would now be) classed as such—especially ephemeral mid-
nineteenth-century Hawaiian imprints that founders Cyrus and Susan
Mills had brought from their mission there—but like the purloined
letter, they remained undetectably obvious. These, on the other hand,
were something unusual—i.e., pretentious and antiquarian. Bender
was at the door with a parcel that needed special attention: a first edition
of Little Dorrit in a fancy binding, a framed leaf from the Nuremberg
The Subtle Symbiosis

Chronicle, and other oddments; they would go in the librarian's office behind her desk.

Elizabeth Gray Potter was the college librarian who oversaw the birth of special collections and her office was by default the only haven for these orphans. On the other hand, Bender had big plans. Over the next two decades he personally delivered hundreds, indeed thousands, of books and literary manuscripts, the great majority of them rare, to the librarians of Mills College. By 1929, Potter's office was no longer able to accommodate the bulk of Bender's philanthropy, and so what had indeed become a "collection" was moved to its own room in a wing newly added to the original Carnegie Library. That this was significant (or portentous) was not lost on the Mills community: there were festivities on the lawn, speeches, and John Henry Nash to toast Albert Bender. The care and feeding of the library's "treasures" had become a part—small at first but later much more significant—of the library's program.

The Shaping of Special Collections

At Mills the process of the formation of special collections could be characterized as gradual accumulation. This should be understood in its most neutral sense and not as a disparagement of the largesse of Albert Bender and other early donors or of the managerial skills of the first college librarians. Indeed, Bender was single-minded in his dedication to Mills (he was a great patron of the art gallery, too) and used to drive to the college from San Francisco once or twice a week bearing gifts, sometimes accompanied by his friend and protégé Ansel Adams. The regularity and predictability that characterized his visits to Mills, however, could not be said to apply to the contents of the packages he was delivering. Bender was an enthusiastic bibliophile with a wide and variable range of interests; he was a well-informed generalist who focused on certain stellar moments in book history. The result of his eclecticism for Mills was a steady influx of "high spot" rare books and literary manuscripts that no librarian would ever dream of discouraging.

As it happened, Albert Bender's book collecting tastes coincided perfectly with the academic needs of the college in ways that no one could have foreseen. For small colleges with small tuition bases and library budgets that are correspondingly small, the task of building a broad and better than adequate library is formidable; this was, of course, a problem shared by all libraries of this type. The particular configuration of courses offered at Mills (which by the way was based upon that of
prominent east coast women’s colleges) required a broad-based approach to library collection development. The full range of *litterae humaniores*, “hard” sciences, and social sciences was (and is) taught at Mills. Bender’s large, general rare book collection was then a resource which nicely dovetailed with the broad academic program, a resource which many students from the 1920s onward could and did enjoy within the context of their coursework. Because of this, the collection was understood by reason of the value and rarity of the materials it contained to be set apart in the physical sense only; never was it considered to be set apart intellectually.

This was more than just a “felicitous conjunction of events.” Bender no doubt knew exactly what he was doing. It can easily be seen that more than any other single factor, the particular bibliophilic orientation of this first and principal donor shaped the library’s rare book collecting policy in its early decades. Was this such an unusual scenario? How many college librarians actually solicited or purchased rare and unusual books and manuscripts for a discrete special collections department? Indeed, how many librarians in the nineteenth and early twentieth centuries were even prepared for that first donation? The extra responsibility and effort required to care for and maintain a collection of rare materials must have seemed an unwanted burden, one to be faced with resignation or even reluctance. Nonetheless, these books and manuscripts started to accumulate and usually at a rate conditioned by both the affluence and the intellectual interests of alums or friends of the library. (It is worth noting here another aspect of the symbiotic relationship that exists between an institution’s academic program and the content of its special collections department. Few will dispute the assertion that a school’s particular curriculum and scholarly orientation will in large measure determine the future intellectual interests of its students. As alumnæ they may form collections of books or papers based on those interests; often these collections are destined for the institutions that were in a very real sense their progenitors. Thus Mills, which has always had a strong program in the performing arts, also has a strong collection in rare dance and theatre books, largely the happy result of alumnae beneficence.)

Into the general rare book and manuscript collection originally formed by Bender are added large and small donations of miscellaneous items from various sources, materials from the circulating collection which have “become” valuable—e.g., the Hawaiian imprints mentioned earlier—and purchases made from the special collections acquisitions budget, a line in the main library’s operating budget. In addition, there are at Mills a number of separate rare book collections.
which were generated by and also support (note the symbiosis) some of the major subject strengths of the college: women’s history, performing arts, fine printing, and book arts. Actually, there are ten of these distinct units in a collection which totals just over 11,000 titles. They are satellites that require separate care and feeding; they have their own budgets, card catalogs, and shelving needs (Betsy Davids’s showercap binding comes to mind); they are fun to browse—too bad it is not allowed. Of course there is now much discussion on the issue of the effectiveness of these disjunct subject collections; that is, whether shelving groups of books apart from the general sequence may be used as an excuse or fall-back for a poorly maintained card catalog or whether in small- to medium-sized closed collections the time and labor spent in administering these independent units is disproportionate to the advantages that may accrue from their independence. And certainly even in small liberal arts colleges they do have great advantages as research and recruitment tools, as objects of faculty interest and pride, and as appropriate memorials to the largesse of certain alumnae or friends of the library. The issue is without doubt very complex, one with compelling theoretical arguments on all sides. Even so, practical considerations should be borne foremost in mind. Such is the philosophy at Mills which does not lure prospective donors of book collections with the promise of a named collection but which, on the other hand, probably would honor a donor’s wish to be independently remembered if it meant getting a desired collection.

Rare Books and Manuscripts in the Academic Context

Among the discrete rare book collections there are several that are devoted to the book arts: books about papermaking, bookbinding, and graphic arts, and collections of examples of fine bindings and press books. These exist to support an active and innovative program of undergraduate and graduate study in the full range of hand bookmaking: printing, typography, bookbinding, and the history of the book. Indeed, education in the “technical arts” of fine printing and binding has been a tradition at Mills since the early 1930s when Rosalind Keep, Mills’ first professor of printing, began publishing under the Eucalyptus Press imprint. In 1983 Mills instituted the first degree-granting graduate program in the book arts in the United States. Although it is a studio-oriented program, Book Arts is one of the departments at Mills that makes extensive use of the rare book collection. And inasmuch as the special collections librarian teaches a course on the history of the book, sits de officio on the thesis committees of several of the second year
Book Arts graduate students, and assists in the administration of the program there is a strong connection and good working relationship between the two entities. Often, Book Arts classes meet in the special collections reading room (the Bender Room); exploration of parts of the collection forms the basis for class assignments. For history of the book students, the rare book collection is their primary lab; all classes meet in the Bender Room (except for occasional printing and binding workshops) and all discussion focuses on the books themselves—they see and, what is even better, handle a great many rare books and manuscripts during the term. Book Arts students are hired with work/study funds to assist the special collections librarian in designing and installing exhibitions, in cleaning and oiling seventeenth and eighteenth century leather-bound volumes, and in working on bibliographical projects. Their exposure to special materials is thus increased and with that so is their interest, and with that so is their proficiency—more symbiosis.

Other humanities and social science courses may derive great benefit from an occasional visit en masse to the library’s special collections department. The books they touch are among the only objects from early European history which are not behind museum cases. Handling a 400 or 500 year old object for the first time may be quite moving; this experience often does impart a sense of flesh-and-blood reality to their studies that cannot be learned in any other way. It also may provide unexpected insights. For example, each year the undergraduate course in Shakespeare comes to the Bender Room to learn how books were produced in seventeenth-century England and to see examples of printing from this period. Until the presentation, none of the students realizes what extraordinarily complex circumstances were required to get the Bard’s words into print. They leave with a healthy appreciation for and, more desirable from the bibliographical point of view, mistrust of the printed word. But they are also turned on, not so much by the librarian’s words as by physical contact with the past; it has a most impressive effect. Thirty to forty such groups—mostly from humanities and social science courses—visit special collections each year for presentations of rare book and manuscript material germane to their syllabi. These presentations are enhancements of the most poignant sort: students are given a physical handle with which to grasp their subject. It is a revelation to discover this collection of “handles,” this tangible nexus with the past in the congenial heart of their library. Those whose interest is first stimulated by these lectures often turn up in the semester-long history of the book course.

Of course scholars also use and appreciate the research value of parts of the book and manuscript collection. However, Mills is like
many other libraries in small liberal arts colleges in that it cannot boast of the quantity and quality of materials needed to sustain the high level of scholarly activity usually found in the rich and varied collections of some university, private, and public libraries. Privately-formed book and manuscript collections are more often bequeathed to the institution from which the collector received his or her highest degree, and this may not be the college. Obviously, this should in no way imply that scholarly work does not take place in college libraries, which it certainly does. However, owing to the nature of their collections and to the special relationship that exists between their collections and the college curriculum, special collections librarians in college libraries may not view service to this type of scholarship as their primary function.

The Rationale for the Special Collections Program

Getting the students in contact with rare books and manuscripts, not only for their intellectual but also, and perhaps more importantly, for their talismanic value—this must be the strongest rationale for the special collections program in the college context. And of course by virtue of size, setting, and academic priorities, colleges seem to be the institutions best suited to effect this contact. College librarians must assume that their programs are influencing young people who are just embarking upon an intellectual life (it would be grossly unfair to operate under any other assumption) and who are eager to know its ways. These librarians add an indispensible dimension to the college curriculum when they provide exciting tools for understanding history and art in novel ways.

There is no question that it is an extremely important part of the special collections librarian’s responsibility to preserve the collections under his or her care. However, the charge “to preserve” must be understood in different ways according to the purpose and functions of the particular collection. One will sympathize with the plight of curators and librarians who feel that their duty is to maintain their collections in such a manner that they will be of use to scholars in the twenty-first and twenty-second centuries and beyond. Most of us consider this intellectual continuity to be of the greatest consequence to civilization. In the case of special collections in college libraries, however, “to preserve” should never be construed to mean “to keep out of the hands of,” since it is also of enormous consequence to civilization that students now be given all possible opportunities for becoming acquainted with the past. Unless this happens we will be cut adrift,
intellectually speaking, long before the "well-preserved" special collections crumble into dust; the existence in future centuries of these curious collections will certainly not be understood, much less appreciated. Seen in this light, the role of the special collections librarian takes on a different meaning: the duties of "custodian" give way to those of "facilitator" whose activities bring about the felicitous conjunction of object and intellect.

References

1. In this article I will not present statistical analyses of collections, budgets, staff, etc. since these have been so recently compiled in Christine Erdmann's Special Collections in College Libraries. Chicago: ALA, 1986. This survey of 108 special collections departments suggests the great diversity in holdings, organization, and philosophy that makes generalizations about the situation in college libraries difficult.

2. Harold Ottesen, the curator of the Margery Bailey collection, has recently written and produced a twenty-three minute videotape which gives the background, scope, and highlights of his collection. Clearly, the same principles that make videotape an effective tool in marketing, advertising, and education can be brought to bear upon the public relations and pedagogical programs of library special collections departments.


4. Albert Bender, a native Irishman, retained close connections with those who back in Ireland were responsible for the great upheaval in the intellectual life there which was even then known as the Irish Literary Renaissance: Jack and William Butler Yeats, J.M. Synge, Lady Augusta Gregory, et al. He was also supportive of the perhaps less well-known Dun Emer Industries, an organization of women founded just outside of Dublin in 1902 by Evelyn Gleeson of the William Morris circle "to find work for Irish hands in the making of beautiful things." A significant part of Gleeson's program, besides weaving and embroidery, was to operate a printing press which by 1908 had evolved into the famous Cuala Press directed by Yeats's two sisters, Elizabeth and Lily. Bender's enthusiasm for the Yeats sisters and their work caught on at Mills even then known as a school that excelled in the teaching of dance, music, painting, and other fine arts. So, one supposes with Cuala in mind, Mills founded its own press, the Eucalyptus Press, in 1932 (and soon after followed a bindery). Cuala had Emery Walker as its first typographic advisor and Mills had John Henry Nash.

Special Collections in the Public Library

LAURA LINARD

Speaking at the official opening of the Chicago Public Library on 1 January 1873, Major Joseph Medill stated:

The influence and power of a city, state or nation, is not measured by its numbers, but by its enlightenment, by its thinkers.... An educated people are always a free people.... Now, I hold that no single agency will contribute more to this most important desideratum than a great public library, amply supported and comprehensively conducted—a library where books will find their way into every household, and their contents into every mind....

From the beginning, the mandate of the Chicago Public Library was clear—to serve the people of Chicago. The first board of directors saw the library as an educational institution that would assist the "common man" in his search for self-improvement. An early board report stated that the library would be a place where working men of the city might employ their idle time profitably in reading instead of wasting it "in haunts of vice and folly and places of ill reputation." In 1896 the directors of Chicago's three libraries—the Newberry, John Crerar, and Chicago Public—agreed to collect only in certain subject areas so as neither to compete for acquisitions nor to duplicate each other's holdings. As a result, the Newberry collected in the humanities, the John Crerar in the sciences, and the Chicago Public in "wholesomely entertaining and generally instructive books specially such as are desired by the citizens for home use. . . ."

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LAURA LINARD

This nineteenth-century view of the public library as an educational institution devoted to the improvement of its users is a vision which exists even today. With this as a stated purpose of a public library, one might wonder what the role of a special collections department is as well as what it might become. When Ellen Shaffer examined this subject in the April 1957 issue of *Library Trends*, she commented that rare book departments "are themselves a little rare. ... Certainly they are not common enough to be taken for granted... their curators are occasionally called upon to explain and justify the existence of such departments."

To look at the situation today, a survey was prepared (see appendix A) and sent to forty-three public libraries, twenty-four of which responded. Only fifteen of the respondents had special collections departments with full-time staff, permanent budgets, and a separate facility. The remaining nine libraries had no permanent staff. One of the responding special collections departments is staffed solely by volunteers from the Library Friends group. The following remarks are based on the fifteen.

The survey was designed to determine the types of special collections held in public libraries as well as the level of support that exists for them. Other questions dealt with the history of the departments, the audiences they serve, and how the departments perceived their institutional roles. Finally, one of the goals of the survey was to find out whether there are certain characteristics common to special collections departments in public library systems.

The Special Collections Department at the Chicago Public Library was founded in 1973 in response to a growing concern that among the books held in the central library and branches were items that required special treatment or storage because of their physical condition or bibliographic significance. By the beginning of the 1970s, the large collections in the system included not only thousands of rare books but also an unknown number of manuscripts, archival collections, and historical artifacts. The first staff members of the Special Collections Department were assigned the task of searching through the stack and storage areas of the system. The material that was "recovered" became the core of the Special Collections Department.

The department was formally dedicated in 1977 in specially designed facilities of the newly renovated Cultural Center. The design of the department was state-of-the-art, with temperature and humidity controls, a Halon gas fire-control system, and a sophisticated security system.

As with the creation of the Special Collections Department at the Chicago Public Library, the stimulus for the creation of the special collections departments in public libraries today is a growing concern that among the books held in the library and branches are items that require special treatment or storage because of their physical condition or bibliographic significance. By the beginning of the 1970s, the large collections in the system included not only thousands of rare books but also an unknown number of manuscripts, archival collections, and historical artifacts. The first staff members of the Special Collections Department were assigned the task of searching through the stack and storage areas of the system. The material that was "recovered" became the core of the Special Collections Department.

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collections departments in almost all of the surveyed libraries was the awareness that among the holdings of the libraries were significant materials that demanded special care. There was a wide range of dates of inception for these departments. The Boston Public Library's Rare Book Department was founded in the "very early half of the 19th century" while the Special Collections Department of the Anchorage Public Library was dedicated in 1986. The Cincinnati Public Library Special Collections Department, founded in 1955, reported that their department's creation was a "gathering together of collections dispersed throughout the various departments of the library"; Philadelphia's department was founded in 1949 though rare books had been purchased since 1899.

The Chicago Public Library is a large system which includes the Central Library, the Cultural Center, two regional, and seventy-six branch libraries. It is the major library resource of the Chicago metropolitan area with a service population of 3,005,072. There are many other libraries and museums in the Chicago area which serve portions of this audience. However, most of them have admission fees or else require membership. Since the Chicago Public Library offers free access—as do most public libraries—the Special Collections Department serves a broad and varied clientele including many who are more unsure of their skill or knowledge and hence are readily intimidated by formidable institutions. Many come to the Special Collections Department to discover what we have or do, regardless of the level of their interest. The remarkable diversity of audience is the essential difference between the special collections department in a public library and that within an academic or private institution. Unlike those institutions, the public library's special collections department has a built-in audience which is composed of the entire population of a community; the only characteristic that the users share is geographic. The libraries queried characterized their audiences as "standard public library clientele," a "varied audience, all types who use a public library," and encompassing "5th grade on to senior citizens." Reflecting on the usage by the public, several of the libraries mentioned that they are used quite often for information about appraisal and conservation. This is certainly true of the Chicago Public Library where we have a handout listing professional appraisers and conservators in the area. Hence, public library special collections departments may act as referral centers informing patrons of resources that are locally available.

The Chicago Public Library is particularly concerned with the history of the city of which it is such a vital part; therefore, many of its collections relate to local history, drama, and literature. For example,
the Chicago Authors and Imprints Collection is a major holding with volumes of early and private editions by major Chicago authors of the nineteenth and twentieth centuries. Another large subject collection comprises materials from the World’s Columbian Exposition held in Chicago in 1893. Still other collections relate to Chicago drama and Chicago neighborhoods.

Many public libraries have some collections that relate directly to their communities; the Cleveland Public Library has a Cleveland Authors and Imprints Collection; the Atlanta Public Library has the Georgia History and Literature Collection and the Margaret Mitchell Collection; the Cincinnati Public Library has the Cincinnati, Inland Rivers, and Ohio Valley Collections. The Anchorage Public Library has the Alaska Collection, the stated purpose of which “is to gather, preserve and make available to the public materials of cultural and historical significance to Alaska and neighboring Pacific Northwest and circumpolar regions.”

Most of the public libraries surveyed hold significant subject collections which have no direct tie to the city, but rather reflect particular donations to the library such as the Grabhorn Collection on Printing History at the San Francisco Public Library, or the Louis E. Kahn English Language Dictionary Collection at the Cincinnati Public Library.

Several of the libraries hold outstanding items in their special collections departments merely because of the long history of the library since some books become valuable over time, or because of the initiative of a particular curator. The Boston Public Library reported significant holdings in Americana, especially abolitionism, slavery, the American Revolution, and the Civil War. One would expect such collections to be strong both because of Boston’s age and because of its geographical location. Yet an equally strong Civil War collection is held by the Chicago Public Library. The Civil War and American History Research Collection, the core of which is the Grand Army of the Republic Collection, was acquired by the library in 1948. Formed mainly by donations from Civil War veterans and their families, it is the largest special collection at Chicago Public accounting for over half of the reference usage.

There are two subject collections at Chicago Public which stand out as examples of what a special collections department in a large public library is uniquely capable of developing. For that reason, these will be described more fully.

At the turn of the century, small historical societies flourished in Chicago. Meeting on a regular basis, these societies gathered materials
that documented the history of their particular neighborhoods. They collected a wide range of items—pamphlets, broadsides, newspapers, photographs, scrapbooks, and so on—that were later deposited with the local branch libraries. Eventually these historical societies closed and interest in and use of the materials diminished. In 1981, with the support of the Dr. Scholl Foundation, the Special Collections Department began a project to recover Chicago's neighborhood history. A full-time archivist was hired to survey, organize, and transfer to Special Collections the individual neighborhood history collections. The resulting Neighborhood History Research Collection comprises forty-one individual collections. Public interest in this collection has been great, and the number of donations and reference queries has increased as knowledge of the collection spreads. Publicizing the existence of this collection to encourage donations has been an important part of this project. The archivist working on the project has become involved in community activities relating to local history such as genealogical society meetings and the annual history fair for high school students.

Exhibitions and programs have also been spurred on by the collection. In 1985 the department created a traveling exhibition that was mounted in fifteen of the branch libraries. In August 1986 the department presented a major exhibition on the collection entitled "Cities Within a City: The Idea of Neighborhoods in Chicago." The exhibition included over 200 items from the collection and was accompanied by an extensive catalog. The department also sponsored a symposium on the subject of Chicago and her neighborhoods. Both the exhibitions and the programs have been well attended.

The Neighborhood History Research Collection is rapidly becoming one of the most heavily used collections, especially by the youngest and most inexperienced patrons who are receiving their first instruction in primary research. The public has enthusiastically supported the development of the collection. This seems fitting since Chicago is probably best known as a city of neighborhoods.

Another collection with great growth potential is the Chicago Theatre History Collection. Chicago is the home of a flourishing theatrical community. Over one hundred theaters and repertory companies are actively working in the Chicago area. In recent years the focus of the national theatrical world has been on Chicago playwrights, actors, actresses, and productions. Theater has always been part of the Chicago scene. In 1837, the year in which the city was incorporated, it had its first theatrical performance. The Special Collections Department holds a large collection tracing the history of Chicago theater. It includes material from theater in the earliest days to contemporary times, the corner-

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stone of which is the Goodman Theatre Archives. In 1985 the department produced a major exhibition with an accompanying catalog entitled, "At the Goodman Theatre." This exhibition and a one-year cataloging project which preceded it were funded by the Goodman Theatre. In 1986 the department received funding to support a twelve-month project to preserve and inventory part of the collection.

The Neighborhood History Research and Chicago Theatre History Collections are representative of what a large metropolitan public library is capable of developing. Both of these collections are of particular interest to the public library community. They involve a high level of participation from the community in terms of donations and usage. And these collections exemplify the kinds of materials that a public library can acquire with a small acquisitions budget, for the key items are ephemeral—the kinds of things that people have buried in their closets and do not know what to do with but do not want to throw out—so people are willing to donate them to public libraries. Collectively such ephemeral items become an invaluable resource. Moreover, both collections are actively supported by private organizations.

An important feature of all the special collections departments surveyed was the emphasis on outreach programs. The Detroit Public Library holds two appraisal sessions each year with antiquarian book dealers acting as consultants. The Atlanta Public Library offers workshops on such topics as "Georgia History: A Community Approach." And the San Francisco Public Library regularly presents lectures on the book arts in cooperation with the Pacific Center for the Book Arts and the Friends of Calligraphy. All of the libraries also indicated that they mount exhibits.

The Chicago Public has a strong exhibition program with four shows each year. Over 200 items appear in each show. Exhibitions have included: "Urban Voices: Chicago as a Literary Place," "Setting the Stage: Chicago Theatre Before the Fire," "The Little Giant: The Story of Stephen A. Douglas," and "Collectors and Connoisseurs: The Caxton Club of Chicago." In addition, the library emphasizes programming directly related to the theme of the exhibitions. "Collectors and Connoisseurs..." was accompanied by a lecture series by members of the Caxton Club on subjects concerning books about which they are experts—conservation, selling, collecting, and design. Exhibitions are well-attended with an average of 350 visitors each day.

Reviewing the surveys, the general commitment to special collections on the part of the central administration was generally good. All the responding libraries suffer from staffing shortages though many felt that this was not a problem unique to special collections departments.
The average staff had at least one full-time professional and one half-time clerical position. Each responding department reported having an acquisitions budget supplemented by endowments and funds from friends' groups. The reported budget range was from $5,000 to $150,000. The quality of facilities reported also varies widely. However, only eight libraries indicated that they have temperature and humidity controls and only three reported having Halon gas fire systems. Directors of special collections are usually two levels below the director of the entire library system.

Every department in the survey seemed to have a clear idea of its role in its institution. One response seemed to sum up the general sentiment: that the special collections department was an essential part of a major research library. However another response touched on what to me is the most important issue: “This rare book department represents the research facilities and collections of the Library; its purposes and functions are necessarily different from the overall purpose of the public library in this respect.” This observation brings up the essential issue of whether or not the mission of a special collections department is necessarily divergent from, and potentially contradictory to, the general mission of the public library. A private or academic library rarely questions its ultimate purpose or its audience whereas the public library is many things to many people. Public libraries are constantly reassessing their primary audience and purpose. They must try to meet the day-to-day needs of the community. This may be done by providing a good collection of recent fiction or self-help books as well as services such as voter registration, literacy programs, and so on. Does a special collections department also address community needs and should it? Each library must determine this itself.

Each public library must decide where to put its limited resources. It is in this choice that a public library begins to define itself. Is a public library a research institution? Within one large institution there can be contradictory answers to this question; the librarian who works at the central location answers yes while the branch librarian says no.

No other unit better represents the research function of a public library than its special collections department. Yet many such departments must justify their existence. One comment from the survey was: “In my institution, although we attract scholars from all over the world, I see my department as a showcase, cited when we have to impress people, bring in visitors, or appeal for money,” while another response was that: “On the one hand it is viewed as the institution’s strongest asset, on the other hand, service for the collection is severely limited by staffing problems.”
As was the case in 1957, separate special collections departments with full-time staffs are still a rarity in public libraries. Their presence in the rare book world is small with only nine of the over 260 librarians attending the 1986 Rare Book and Manuscript Pre-Conference in New York City representing public libraries. In Rare Books, 1983-84, only seventeen public libraries are listed as having special collections departments. My survey, sent to forty-three libraries, represents only large metropolitan public libraries.

The Chicago Public Library Special Collections Department assiduously maintains a high profile with the institution and the community. We try to acquire collections which will have a great deal of community and hence administrative support. Our outreach programs also garner community support and show the administration the important role these programs play in educating and providing services to the community. We actively seek outside support to fund special projects; such support allows us to provide programs which the library itself cannot fund.

In their first annual report, the Board of Directors of the Chicago Public Library wrote in true Victorian fashion: “The treasures of all knowledge contained in books will be dispensed in free and equal abundance to all, the same as the sun dispenses its light and the infinite magnificence of heaven is within reach of all eyes, and every human intelligence is blessed under that of God’s.” A special collections department can introduce to the public the world of knowledge and continue to fulfill its primary mission if not under the guidance of the heavens, at least under the direction of an innovative curator.
Appendix A

Survey of Special Collections Departments

1. What year was the Special Collections Division founded? And under what circumstances?

2. What is the relative size of your collection?

3. Please give a short description of your collection and collecting interests.

4. What is the size of the staff of Special Collections? Give the number of professional and nonprofessional positions and job titles.

5. What is the amount of your overall budget, including personnel? What is the amount of your acquisitions budget?

6. Briefly describe your facilities. Does it include temperature and humidity controls, security controls, etc.?

7. Describe your position in the overall library's administrative chart.

8. What is your average usage? Describe the audience you serve.

9. Do you have an active exhibition program or other public outreach program?

10. How would you characterize the role of the Special Collections Division in your institution?

11. Please give any other remarks you feel would be helpful.

Name of person completing survey: ____________________________
Position: ____________________________________________
Date: ________________________________________________
LAURA LINARD

References

1. Hoyne, Thomas. Historical Sketch of the Origin and Foundation of The Chicago Public Library, Compiled from the Original Documents and Correspondence and Contemporary Publications as the Same have been Preserved in the Hands of the Compiler, Thomas Hoyne. Chicago: Beach, Barnard and Co., 1877, pp. 28-29.


5. The libraries which responded to the survey that met the criteria to be used in this article were:

- Anchorage Public Library
- Atlanta Public Library
- Boston Public Library
- Buffalo-Erie Public Library
- Cincinnati Public Library
- Cleveland Public Library
- Dallas Public Library
- Detroit Public Library
- El Paso Public Library
- Houston Public Library
- Minneapolis Public Library
- New Bedford Public Library
- Philadelphia Public Library
- Providence Public Library
- San Francisco Public Library

The New York Public Library—which is funded largely through private sources—was excluded. The criteria for the survey were for the libraries to have a separate special collections department, a full-time staff, an annual budget, and a defined space within the library. I sent surveys to each public library listed in the Rare Books, 1983-84. I then sent surveys to libraries listed in the ALA Yearbook, 1986. I selected large metropolitan areas primarily and attempted to send a survey to at least one city in each state.


Acquiring Rare Books by Purchase: Recent Library Trends

SAMUEL A. STREIT

This article presents the results of a survey (reproduced as appendix A) designed to collect data related to the purchase of rare books by American libraries. (The survey left the definition of the term rare book to each respondent, but it excluded all nonbook materials.) Survey questionnaires were distributed to 164 American libraries, including one to each U.S. member of the Association of Research Libraries (ARL). Additional academic, public, and independent libraries known to have important rare book collections also received survey questionnaires. Questionnaires were returned by 136 libraries representing 83 percent of the total distributed (responding libraries are listed in appendix B). Data gathered by the survey are presented and analyzed later under five general questions intended to explore current trends and recent changes in funding patterns for rare book acquisitions in American libraries. The data will be followed by pertinent commentary supplied by survey respondents. Because of the confidential nature of the survey, no individual or institutional names are included in the article.

Summary Findings

Although virtually all American libraries rely heavily on gifts to sustain and build their rare book collections, the great majority of the libraries surveyed stated that they also purchase rare books. This is equally true of large and small libraries, public and privately supported
libraries, and libraries of widely differing financial capabilities. It is also equally true regardless of whether the library is an academic, public, or independent library.

Despite the large number of libraries that purchase rare books, twice as many spend under $50,000 per year for that purpose as spend over that amount; indeed, a sizable proportion of respondents stated that they spend under $10,000 per year on rare books. To some extent, this situation reflects obvious differences in financial capability though this is not necessarily the case. In a substantial number of instances, there is no relationship between the size of the overall library budget for acquisitions and the amount spent for rare books. Some libraries with smaller budgets including several that are hard pressed to support "general" collection needs, spend more proportionately (as well as in actual dollars) than do a substantial number of wealthier libraries. Similarly, institutional goals and mission frequently influence decisions regarding the level of financial support directed toward rare book acquisitions. The usual assumption is that those libraries with a tradition of supporting research or curricular interests in the humanities also support the purchase of rare books, and to a considerable extent this assumption is borne out. However, there are again interesting exceptions particularly in the number of academic institutions that sustain extensive graduate programs in the humanities but whose libraries do not substantially support their rare book collections through purchase. Essentially, therefore, the survey shows that neither in terms of overall acquisitions budget nor in institutional goals and mission can the level of support for rare book purchases be equated with library or institutional size, wealth, or complexity.

The survey shows that most of the responding libraries employ a wide range of funding sources for rare book acquisitions, usually some combination of endowment income, annual appropriations, unbudgeted discretionary funds, and funds supplied by a support group such as a Friends of the Library organization. Perhaps most significantly, the survey underscores the important role played in most libraries by both endowment income and annual appropriations. For example, 85 percent of the responding libraries that spend over $50,000 per year for rare books, and 76 percent of those that spend under $50,000 utilize endowment income. However, 67 percent of the libraries that spend over $50,000 per year for rare books also utilize annual appropriations as do 70 percent of those libraries that spend under $50,000 per year.

Although both discretionary funds and support group funds were often included as sources for rare book acquisitions support, neither is as important a factor as endowments or annual budgeted allocations.
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This is demonstrated by the fact that almost 100 percent of the survey responses indicated that discretionary funds and support group funds are used in combination with endowment income and/or annual allocations; only three respondents reported that their libraries use discretionary funds or support group funds to the exclusion of endowments or annual allocations. Further, the survey result shows that discretionary funds and support group funds do not, in general, provide as much financial support for rare book acquisitions as do endowments and annual appropriations. For example, 90 percent of the libraries that use support group funds for purchasing rare books receive less than half of their acquisitions funds from that source.

Nearly two-thirds of the surveys stated that funding for rare book acquisitions is insufficient and only five respondents declared their funding for this purpose to be ample. No matter the level of support in terms of dollars spent for rare books, the percentage of responding libraries' total acquisitions funds allotted to rare book purchases, including funds restricted for that purpose, is in the majority of cases quite small. Of the responding libraries, 61 percent disclosed that less than 5 percent of their library's total acquisitions funds are applied to rare book purchases; of the remainder, 17 percent receive between 5 percent and 10 percent, and 22 percent receive over 10 percent of their library's total acquisitions allocation.

A majority (56 percent) of the surveys reported that growth patterns in rare book acquisitions funding have not increased consistently between 1980 and 1986, although virtually the same percentage of respondents stated that their ability to purchase rare books in 1986 is equal to or greater than it was in 1980. The surveys indicate that roughly the same number of independent libraries and public libraries have experienced consistent growth as have not. The most significant discrepancy occurs among academic libraries for which statistics show that publicly supported libraries, including several with sizable base budgets for rare books, experienced considerably more erratic funding patterns between 1980 and 1986 than did libraries in privately supported institutions.

As noted earlier, over half of the respondents stated that their ability to purchase rare books is better in 1986 than in 1980, a figure that includes some libraries that did not experience consistent growth during the same period. The survey also shows that some libraries that did experience consistent growth between 1980 and 1986 did not necessarily find their actual ability to purchase rare books to be equal in 1986 to what it had been in 1980. Various reasons were cited by respondents as
factors, either in causing funding patterns that did not produce consistent growth and/or did not result in an acquisitions picture that was better in 1986 than in 1980. Chief among these were inflation, static or declining budgets, and the perception that inflation in the cost of rare books generally exceeds inflation in the economy as a whole.

The majority of responding libraries have not in the past five years undertaken fund-raising efforts that include acquisition funding for rare books. Furthermore, only ten respondents indicated that their libraries are planning fund-raising efforts that will benefit rare book purchases. Fund raising programs for rare books, as reported in the survey, usually have been undertaken within the context of a larger library or institutional campaign, especially in academic settings. In the majority of these cases, an institutional development office has been responsible for conducting the campaign. In a small number of cases, the library itself has conducted the effort, through its own development office and/or by using other library staff. Only eight respondents stated that fund-raising benefitting rare book acquisitions has not directly involved special collections personnel. Conversely, in a handful of instances, the special collections staff was responsible for the entire fund-raising effort.

A sizable majority of respondents, just over 75 percent, stated that they are reasonably optimistic about their libraries’ ability to purchase rare books in the future. This overall feeling of optimism was not only reported from libraries with large budgets and active programs but also from smaller institutions with more modest goals. It should be noted as well that respondents from several well-established and wealthy rare book collections were not particularly optimistic about their future ability to purchase rare books. All told, however, it would appear that despite difficult times characterized by small budgets, competing interests within the library, and unstable growth patterns, most of those members of the library profession who nurture and build rare book collections are gamely looking ahead toward better days.

Are Libraries Purchasing Rare Books?

Although virtually all rare book collections in American libraries rely heavily upon gifts for their growth, the overwhelming majority of respondents to this survey stated that their libraries routinely buy rare books. Only seven libraries, two of which are members of ARL, reported that they buy no rare books or do so only rarely. Sixty-five respondents also reported that it is the responsibility of the special collections unit of their libraries to expend funds for virtually all purchases of rare books,
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although almost half of the sixty-five indicated that other library staff participate on an occasional advisory or consultative basis. Forty respondents stated that the special collections staff routinely share the duty and cost of purchasing rare books for their libraries special collections unit with language specialists and/or subject bibliographers. The question did not apply to nine libraries because of their nature and organization. Table 1 shows the annual range of total expenditure for rare books as reported by 136 respondents. Based on these figures, there are almost twice as many libraries that spend under $50,000 per year for rare books as spend more than that amount. The surveys point to the fact that no single range of expenditures is dominated by any particular type of library. All ranges contain large and small publicly and privately supported academic libraries, public libraries (with the exception of ranges 4 and 5) and independent libraries. Further, each range includes both urban and rural libraries and libraries in every geographical region of the country. Seventy-six of the libraries represented in the table are members of ARL; of that number, forty-three are included in the lower three ranges while thirty-three are included in the higher three ranges.

TABLE 1
EXPENDITURE RANGES FOR RARE BOOK ACQUISITIONS

<table>
<thead>
<tr>
<th>Range Expended on Rare Books Annually</th>
<th>Number of Survey Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range 1. Under $10,000</td>
<td>39</td>
</tr>
<tr>
<td>Range 2. $10,000-$24,999</td>
<td>26</td>
</tr>
<tr>
<td>Range 3. $25,000-$49,999</td>
<td>17</td>
</tr>
<tr>
<td>Range 4. $50,000-$74,999</td>
<td>6</td>
</tr>
<tr>
<td>Range 5. $75,000-$99,999</td>
<td>9</td>
</tr>
<tr>
<td>Range 6. Over $100,000</td>
<td>27</td>
</tr>
<tr>
<td>TOTAL</td>
<td>124*</td>
</tr>
</tbody>
</table>

*Seven responding libraries do not purchase rare books and five libraries did not specify an expenditure range.

It is frequently assumed that libraries with greater financial resources purchase rare books to a greater extent than do poorer libraries and, in the main, the survey bears out this assumption. For example, a comparison of data gathered by the survey with the most recently published ARL statistics (1984/85) for materials budgets (not including binding) shows that of the twenty-seven ARL academic libraries expending over $50,000 per year for rare books, twenty-one (78 percent) were ranked in the upper half of the materials budget statistics. Of the forty-two academic ARL libraries expending under $50,000 per year for rare books, twenty-six (62 percent) were ranked in the lower half of the ARL materials budget statistics.
The same comparison of survey data to ARL materials budget statistics also shows that in a considerable number of instances there is no clear relationship between the amount expended for rare books and the size of the parent library's overall materials budget. This is demonstrated by the fact that sixteen academic ARL libraries that expend under $50,000 per year for rare books (38 percent of forty-two) were ranked in the upper half of the ARL materials budget statistics. Four of these libraries boasted a 1984/85 materials budget in excess of $4 million.

In a related question, the survey asked respondents to indicate whether their libraries allocate less than 5 percent, more than 5 percent, or more than 10 percent of the total library acquisition budget to rare books. Eighty-five respondents answered that rare books receive under 5 percent of the acquisitions budget, fourteen answered that they receive over 5 percent, and nineteen answered that they receive over 10 percent. The latter figure includes five libraries virtually all of whose materials purchases are rare books. Overall, approximately 75 percent of those libraries expending over 5 percent or over 10 percent of their acquisitions budget on rare books are in academic institutions, both public and private. The remaining 25 percent are independent libraries.

Of the forty-two libraries that spend upward of $50,000 per year on rare books, fifteen receive less than 5 percent of their library's total materials allocation (thirteen of these are ARL academic libraries); eleven receive more than 5 percent of their library's total materials allocation (nine of these are ARL academic libraries); and fourteen receive more than 10 percent of their library's total materials allocation (four of these are ARL academic libraries). Of the eighty libraries that spend less than $50,000 per year on rare books, seventy-two receive less than 5 percent of their library's total materials allocation (forty-three of these are ARL academic libraries); three receive more than 5 percent of their library's total materials allocation (none are ARL academic libraries); and five spend more than 10 percent of their library's materials allocation for rare books due to the fact, as noted earlier, that they are primarily rare book libraries (none are ARL academic libraries).

Equally as enlightening as the statistical information provided by the survey were the respondent's comments which elaborated upon the questionnaire. In expounding upon issues discussed earlier statistically, several respondents commented that despite vicissitudes in funding, their libraries actively purchase rare books. One correspondent stated that he hoped that even though

the pattern varies from year to year, I have in my response...given more optimistic replies than the present grim financial picture [in my
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library] might seem to support. The reality is that there are lean years and good years and that it is hard to predict the combination of circumstances that will make it possible for the Library to devote a larger percentage of its resources to non-current acquisitions.

Several writers from academic libraries pointed out that their rare book purchases were made with a close eye to the instructional and research goals of their parent institutions. One respondent wrote that “our rare book collection complements our primary purpose of supporting an undergraduate curriculum....Beyond that we occasionally purchase a rare book when it would fit one of our existing special collections...or when we can be certain that it will be used to enrich the undergraduate educational experience.” Another wrote that:

The success of our program relates directly to the fact that it is integrated with larger library collection development efforts. We don’t buy ‘rare books;’ we acquire materials for research and scholarship. The difference in perspective is important. I calculate that (my library) probably buys between 3500-5000 titles annually which happen to fall into the category of “rare.”

One respondent whose institution has only recently begun purchasing rare books stated that: “Four years ago, ‘rare’ books were acquired solely by gift. Consequently, the collection has grown in a very haphazard manner. Over the past four years, areas of modest strength have been identified and efforts are being made to enhance those areas of the collection through purchase and the judicious acceptance of gifts.”

Though they were in the minority, other respondents wrote of difficult times for the purchase of rare books in their libraries, with one describing the situation as “bleak.” Several stated that their libraries had priorities other than rare books either as a matter of policy or because of overall funding shortages. One respondent wrote that

the acquisition of rare books in our library will be at a minimal level and without significant new directions until a substantial endowment or restricted fund is established solely for the purpose. The amount of funds available from the library general materials budget is very low, but, even so, represents a rather severe wound in certain subject areas that badly need that money for current purchases. It is difficult to justify the purchase of rare books from a general materials fund that is severely strapped as it is.

Answering in a similar vein, a second respondent whose library is supported primarily by public funds declared that a “funding cut for all acquisitions is about to be imposed and I expect rare book funds to be cut disproportionately.” Several of the libraries that purchase relatively few rare books as a matter of policy were characterized as having traditionally relied on gifts rather than purchase. Only one respondent wrote
that library policy has been altered to diminish the number of rare books purchased. In this instance, the library has purchased microform or facsimile editions of early printed works and thus "has eliminated much of our library's interest in acquiring by purchase original editions that are duplicated in those sets. Exceptions to this observation are rare books that are of special interest for their graphic arts values, for which our researchers consider microform or reprint editions to be inadequate substitutes."

What Are the Sources of Rare Book Acquisitions Funds?

Survey tabulations suggest that the majority of responding libraries which purchase rare books do so using some combination of endowed funds, annual appropriation, unbudgeted administrative discretionary funds, and funds supplied by such support groups as Friends organizations. Of 127 responses, 108 use endowment income (81 percent of 127), 92 use annual appropriations (72 percent of 127), 63 use discretionary funds (50 percent of 127), and 79 use funds supplied by support groups (62 percent of 127). Only nineteen libraries rely on only one source of funding; seven libraries, all of them academic, except for one public library, rely on endowment income exclusively and only nine (six academic, two independent, and one federal library) exclusively rely on annual appropriations. Two libraries of the total number, both academic, depend exclusively on discretionary funds and one academic on funds from a Friends group.

Approximately the same number of libraries use income from restricted endowments (forty-two) and from a combination of restricted and unrestricted endowments (forty-five); a third category, consisting of eleven libraries, possess unrestricted endowments only. Academic and independent libraries are found in all three categories with public libraries primarily reporting restricted endowments; exceptions are one public library and one federal library that use both restricted and unrestricted endowments.

The largest group of responding institutions, thirty-one predominately academic libraries, employ all of the means of funding rare book purchases described earlier. Fifteen libraries (nine academic, two public, three independent, and one federal library) rely on a combination of endowment income and annual appropriation only. A second group of fifteen libraries (ten academic, one public, and four independent) depend exclusively on endowments and funds furnished by support groups. A slightly smaller group of thirteen libraries (eleven academic, one public, and one independent) combine endowments, annual appropriations and funds from support groups. Eight libraries (five academic
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and three independent) utilize endowments, discretionary funds, and support group funds but do not use annual appropriations. Five libraries or fewer depend on either annual appropriations and discretionary funds (three academic and one federal library), annual appropriations and support funds (five academic) or a combination of the two (four academic). Only two libraries rely on endowments combined with discretionary funds.

The relationship of spending patterns to sources of rare book acquisitions funds can be summarized as follows:

1. The twenty-seven libraries which spend over $100,000 per year on rare books tend to receive their funding either primarily from endowments (six), from a combination of endowments and annual appropriations (eleven), or from a combination of endowments, annual appropriations, discretionary funds, and support group funds (nine). Only one library in this category reported that its chief source of rare book acquisitions income consists exclusively of an annual appropriation.

2. The fifteen libraries spending between $50,000 and $99,999 derive their funds for the most part from endowments (three), annual appropriations (five), or a combination of the two (six). No libraries spending in this range use discretionary funds or support group funds except for one library that reported using both in combination with endowments and annual appropriations.

3. Of the forty-three libraries spending between $10,000 and $49,999, there is a similarity in the number of those relying exclusively on endowments (fourteen), on a combination of endowments and annual appropriations (thirteen), or on a combination of endowments, annual appropriations, discretionary funds, and support group funds (ten). Fewer (six) depend on annual appropriations exclusively and none depend on either discretionary or support group funds exclusively.

4. At the lower end of the scale, the thirty-seven libraries which spend under $10,000 per year on rare books employ the broadest range of funding sources; seven rely on endowments exclusively, nine on annual appropriations exclusively, and twelve on a combination of the two. Only in this spending range do libraries exclusively depend on discretionary funds (one) or on support group funds (two). Six libraries spending under $10,000 per year use a combination of endowments, annual appropriations, discretionary funds, and support group funds, albeit in quite small amounts.

Several libraries reported sources of acquisition income other than those described, but none of these sources are sufficiently common to
measurably alter the pattern outlined in the preceding paragraph. Among the more common of these occasional sources of income are donations of money for specific, one-time purchases, memorial gifts, university funds, university foundation funds, and bequests. One academic library reported that it receives money from its alumni association and one public library reported that it has received federal funds via the Library Services and Construction Act. Five libraries, all academic, stated that they generate funds through deaccession of out-of-scope or duplicate materials.

In commenting on the sources of rare book acquisitions funds, several respondents described their libraries' situation in terms of a combination of sources. One respondent wrote that "funding rare book purchases takes place in the context of overall library acquisitions funding. The Rare Book Collection receives an annual allocation (modest) from the appropriated funds. In addition we have some dedicated funds and endowments for the purchase of rare books." A second respondent wrote that "I have a small fund ($5,000) to make routine small purchases, this from the library general budget. Beyond that considerable funds are available from restricted and discretionary funds in the Director's office—and beyond that the central University administration regards it as their business/responsibility to find funds for acquisitions of major collections/items." A third respondent whose library receives considerable funding from a support group stated that: "Because of the strength of support from our friends organization (and individuals who support our programs) we have been able to respond to many opportunities for acquisitions. The result is that we do not rely exclusively on the actual budget...[which] includes both state and endowed funds (as does that of our parent institutional library)."

Several respondents noted difficulties with their sources of rare book acquisitions funds. One respondent commented that "acquisition of rare books in the future will increase only if deacquisition funds increase and if endowments are expanded; living on mandated state monies is a precarious position for rare books." A second respondent from a publicly supported library wrote that as "endowment funds...are acquired [as well as] other special contributions for the purchase of rare books, we are concerned that the regular funding not be decreased accordingly." Citing a problem of lack of flexibility, a respondent from an independent library stated that "I would feel more comfortable with the establishment of a fund specifically for the purpose of special collections purchases. The present system here of taking money from the general book funds does not help in my effort to plan ahead."
Acquiring Rare Books

Reflecting upon lack of administrative support, one respondent in a privately supported academic library wrote that although we have a detailed collections development policy...we are pretty much out on our own (i.e. not directly tied to curriculum support) so we are treated marginally when it comes to allocation of funds from the operating “hard” money or the gift, “soft” money fund. I am convinced that I could convince “the public” and alumni to support the purchase of rare books much more easily than I can convince the library administration. It’s a real struggle.

Is Funding for Purchasing Rare Books Adequate?

Of 127 responding libraries, 78 (61 percent) stated, often very emphatically, that funding for the purchase of rare books was insufficient. Forty-four libraries (35 percent) stated that funding for rare book acquisition was satisfactory but only 5—all but one academic libraries—stated that funding was ample. Two of the libraries reporting ample funding spend over $100,000 per year on rare books, one spends between $75,000-$100,000, one spends between $50,000-$74,999, and one, which does not routinely acquire rare books, spends under $10,000.

Libraries stating that their funding for rare book acquisitions is satisfactory consist of forty-one academic libraries (twenty-five ARL members), one independent library, and two federal libraries. Their spending patterns are shown in table 2 (two libraries did not indicate a spending range). Libraries in the lower spending ranges of the group reporting that their rare book acquisitions funds are satisfactory are predominately smaller academic libraries, while those in the higher ranges tend to be larger university libraries. There are, however, four ARL academic libraries which reported that they are satisfied to spend under $10,000 per year on rare books.

Libraries stating that their funding for rare books acquisitions is insufficient consist of sixty-six academic libraries (fifty-five ARL members), eight independent libraries, and four public libraries. Their spending patterns are shown in table 3 (four libraries did not indicate spending range). Throughout the ranges in table 3, libraries stating that acquisitions funding for rare books was insufficient were predominately academic, most of them larger university libraries. This was especially true in the lower ranges, but it was also true in the higher ranges. For example, of those libraries which find funding in excess of $100,000 per year to be inadequate, ten are academic libraries, two are independent libraries, and one is a public library.
SAMUEL STREIT

TABLE 2
SPENDING RANGES OF LIBRARIES REPORTING SATISFACTORY LEVELS OF FUNDING FOR RARE BOOK ACQUISITIONS

<table>
<thead>
<tr>
<th>Range</th>
<th>Number of Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range 1. Under $10,000</td>
<td>13</td>
</tr>
<tr>
<td>Range 2. $10,000-$24,999</td>
<td>5</td>
</tr>
<tr>
<td>Range 3. $25,000-$49,999</td>
<td>7</td>
</tr>
<tr>
<td>Range 4. $50,000-$74,999</td>
<td>2</td>
</tr>
<tr>
<td>Range 5. $75,000-$99,999</td>
<td>6</td>
</tr>
<tr>
<td>Range 6. Over $100,000</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>42*</td>
</tr>
</tbody>
</table>

*Two libraries did not indicate a spending range.

TABLE 3
SPENDING RANGES OF LIBRARIES REPORTING INSUFFICIENT LEVELS OF FUNDING FOR RARE BOOK ACQUISITIONS

<table>
<thead>
<tr>
<th>Range</th>
<th>Number of Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range 1. Under $10,000</td>
<td>24</td>
</tr>
<tr>
<td>Range 2. $10,000-$24,999</td>
<td>21</td>
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<tr>
<td>Range 3. $25,000-$49,999</td>
<td>10</td>
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<tr>
<td>Range 4. $50,000-$74,999</td>
<td>4</td>
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<tr>
<td>Range 5. $75,000-$99,999</td>
<td>2</td>
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<tr>
<td>Range 6. Over $100,000</td>
<td>13</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>74*</td>
</tr>
</tbody>
</table>

*Four libraries did not indicate a spending range.

In answer to whether rare book acquisition funding has increased every year since 1980, 44 percent (fifty-one respondents) answered yes and 56 percent (sixty-six respondents) answered no. The positive responses consist of forty-one academic libraries (thirty-one ARL members), seven independent libraries, and three public libraries. Fifteen of the forty-one academic libraries (37 percent) are in public institutions. Nine of the fifteen (22 percent of forty-one) spend over $50,000 per year on rare books. Ten private academic libraries (24 percent of forty-one) whose rare book funding has increased steadily since 1980 spend over $50,000 per year, leaving five public academic (12 percent of forty-one) and fifteen private academic libraries (37 percent of forty-one) in the category that spend under $50,000 per year (two libraries did not report a spending range). Four independent libraries that spend over $50,000 per year saw continued growth in their rare book acquisitions funding between 1980 and the present, while three that spend under
$50,000 saw steady growth. All three public libraries experiencing continued growth during this period spent under $50,000.

Of the sixty-six negative responses regarding continued growth in rare book acquisitions funding since 1980, fifty-five (83 percent) were from academic libraries (forty-one ARL members), six (9 percent) were from independent libraries and two (3 percent) were from public libraries; all three responding federal libraries are included in this group as well. Thirty-seven of the fifty-five negative responses (67 percent) from academic libraries were from public institutions, eight (22 percent) of which spend over $50,000 per year on rare books with the remaining twenty-nine (78 percent) spending less; three private academic libraries whose rare book funding has not increased steadily since 1980 spend over $50,000 per year while fifteen private academic libraries spend less than $50,000. Three independent libraries whose rare book acquisitions budgets have not risen steadily since 1980 spend over $50,000 per year while three spend less. One public library spending over $50,000 and one spending less have not seen steady growth in their rare book acquisitions funding.

Responding to a similar question that asked whether the ability to purchase books is equal today to what it was in 1980, sixty-seven (58 percent of 115) libraries answered in the affirmative and forty-eight (42 percent of 115) in the negative. The affirmative responses consist of fifty-seven academic libraries (forty-two ARL members), eight independent libraries, one public, and one federal library. Twenty-nine of the fifty-seven academic libraries (51 percent) are in public institutions. The negative responses consist of thirty-eight academic libraries (twenty-nine ARL members), four independent libraries, four public libraries and two federal libraries. Twenty-one of the thirty-eight academic libraries responding negatively (55 percent) are in public institutions. Slightly over half of the libraries responding that their ability to purchase rare books today is equal to or greater than it was in 1980 also answered that their rare book acquisitions funding has increased every year since 1980. Of the remainder, several respondents noted that while growth in acquisitions funding has been unsteady, their ability to purchase in 1986 is clearly improved over what it was in 1980. Only twelve of the forty-eight libraries reporting that their ability to purchase rare books is not equal to what it was in 1980 indicated that despite that fact there had been a steady increase in acquisitions funding during that period; of the twelve, four qualified their response by stating that growth in their ability to purchase, while steady, had been “slight,” “modest,” or “minute.”
Just over one-third of the sixty-seven libraries reporting that their ability to purchase rare books today is equal to or greater than it was in 1980 spend over $50,000 per year on rare books. This group of libraries consists of twelve private academic libraries, seven public academic libraries, five independent libraries, and one federal library. In contrast, 25 percent of the forty-eight libraries which cannot purchase rare books at the level they could in 1980 spend over $50,000. Those libraries spending under $50,000 per year and whose ability to buy rare books is greater than in 1980 consist of fourteen private academic libraries, twenty-one public academic libraries, four independent libraries, and one public library. Those libraries spending under $50,000 per year and whose ability to purchase rare books is not equal to what it was in 1980 consist of fourteen private academic libraries, eleven public academic libraries, two independent libraries, four public libraries, and one federal library.

It is important to consider the relationship between sources of funding and patterns of growth in the purchasing of rare books by libraries in the period 1980-86. Table 4 shows that in terms of consistency of growth between 1980 and 1986, those libraries relying primarily on endowment income or a combination of endowment income and annual appropriations generally have fared better than those libraries relying primarily on annual appropriations alone. However, the table also shows that insofar as actual ability to purchase rare books in 1986 relative to 1980 is concerned, those libraries that utilize a combination of endowments and annual appropriations do considerably better than those libraries that rely primarily on endowments or that rely on annual appropriations alone.

Libraries whose ability to purchase rare books is not equal today to what it was in 1980 most commonly cited inflation, the price of rare books, and static acquisitions funding as causative factors. Thirty-four of fifty-four responding libraries (63 percent), among them a representative mixture of academic, independent, and public libraries, stated that inflation in library materials generally has adversely affected their ability to buy rare books. Thirty-five libraries (65 percent) stated that a primary negative factor is that the price of rare books has increased at a rate greater than library materials in general. Twenty-six libraries (48 percent) answered that both inflation and the price of rare books have had a negative impact on purchasing ability, which indicates that many respondents are of the opinion that rare book prices have exceeded inflation.

Twenty-five respondents (46 percent) stated that their libraries’ ability to buy rare books has been hampered by a static acquisitions
### TABLE 4
GROWTH PATTERNS IN RARE BOOK PURCHASING BY LIBRARIES, 1980-86

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</thead>
<tbody>
<tr>
<td>Endowment</td>
<td>47%</td>
<td>53%</td>
<td>36%</td>
<td>64%</td>
</tr>
<tr>
<td>Annual Appropriations</td>
<td>32%</td>
<td>68%</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>Combination of Endowment and Annual Appropriations</td>
<td>46%</td>
<td>54%</td>
<td>69%</td>
<td>31%</td>
</tr>
</tbody>
</table>

budget while eleven respondents (26 percent) cited an actual cut in acquisitions funds for rare books. Libraries whose rare book acquisitions funding has been limited by a static budget consist of nineteen academic libraries (seventeen ARL members), two independent libraries, and three public libraries. Libraries whose rare book acquisitions funding has been limited by a cut in funding include nine academic libraries (eight ARL members), one independent library, and one federal library.

A relatively small number of respondents cited other priorities within Special Collections as a factor leading to less funding for rare book purchases in 1986 than in 1980. Among these priorities is the diversion of rare book acquisitions funds to other kinds of acquisition, e.g., manuscripts or reference works (thirteen), to staff salaries (three), for equipment and supplies (one), or for such support services as online catalog costs (two).

Respondent comments varied widely on whether rare book acquisitions funding is insufficient, satisfactory, or ample. Many indicated insufficient income due to fluctuating endowment income, the unreliability of state funding, or on other library priorities. A typical response stated that “some of the collections by necessity suffer from benign neglect” though others were considerably more pointed, for example, those who cited lack of support from their library’s administration. One respondent went so far as to say that there “seems to be an increasing number of Library Directors who are illiterate—or at best, unfamiliar
with books, documents, and original scholarship. Their educational process is taxing." A more sanguine respondent wrote that:

Only twice in 10 years have we not been able (late in a fiscal year) to purchase rare book materials for our priority collecting area. From this perspective, funding may be termed "ample." On the other hand, given a finite amount of money, the realization that building collections takes time, and a sense that we should make the best (responsible) use of what is allocated, the funds for other collecting areas are "satisfactory." I have little doubt that I could spend (and spend responsibly) several times the amount allocated.

In answering questions related to rare book purchasing ability over the past five years, many respondents indicated that while growth had not necessarily been steady, their libraries' ability to purchase in 1986 was at least as good as it was in 1980, and in many cases better. As one respondent noted.

The Library's "Materials Budget" was cut 10% in FY 81/82 and is only now beginning to have similar purchasing power. More recently, non-state funds (grant overhead monies) have been withdrawn from the Library and this [had] represented major discretionary funds for rare book purchases. Nonetheless, I would characterize the overall decline to represent not more than 10-15% over the purchasing power in 1980.

A second respondent whose library has undertaken an aggressive program of developing Special Collections in recent years wrote that his library's ability to purchase rare books was considerably greater in 1986 than in 1980. He wrote that

the buying of rare books here has increased because of effective lobbying efforts on the part of Special Collections staff, backed by faculty support. In addition to increased allocations from library book funds, the Friends group has also been more generous in response to lobbying efforts. Both sources have increased allocations nine-fold since 1980.

**Are Efforts Being Made to Increase Rare Book Acquisitions Funding?**

Although most libraries continue to purchase rare books, the majority are not undertaking fund-raising efforts to increase rare book acquisitions. During the past five years, only 47 of 127 responding libraries (36 percent of the total) have undertaken a fund-raising effort specifically for, or including, increased rare book acquisitions funding. An additional ten libraries reported that they are planning acquisitions
fund-raising efforts for rare books. Twenty-nine of the forty-seven (62 percent) libraries that have undertaken a campaign in the past five years have done so within the context of a larger library or institutional campaign as will three of the ten libraries anticipating a campaign. Of the fifty-seven libraries that have either undertaken a campaign to increase rare book acquisitions funding in the past five years or are about to undertake such an effort, forty-seven (83 percent) are academic libraries, twenty-nine publicly supported, and nineteen privately supported; forty-one are members of ARL. The remainder consists of eight independent libraries and two public libraries.

The responsibility for conducting fund-raising efforts for rare book acquisitions funds, as reported in the survey, usually involves the institutional development office working in conjunction with library staff. This is especially true of academic libraries and larger independent libraries. Twenty-six (twenty-three academic and three independent) of forty-four responding libraries stated that fund-raising efforts for rare book acquisition funds had been undertaken by the institutional development office. Eighteen libraries reported that their fund-raising efforts were undertaken without the direction of an institutional development office. Ten of these library campaigns, nine academic and one public, were undertaken either as part of a wider library fund-raising program or as an effort targeted by the library administration specifically for rare book acquisitions funds. Three of the ten libraries, all academic, stated their fund-raising effort was undertaken by their library development office though in each case the program was conducted in cooperation with a larger institutional development office.

No matter under whose aegis fund-raising for rare book acquisition was conducted, most respondents indicated that Special Collections personnel were involved directly. Only five libraries (all academic) of the twenty-six whose fund-raising was undertaken by an institutional development office failed to respond or stated that special collections had not been involved. Three (two academic and one public) of the ten libraries whose fund-raising was conducted without benefit of an institutional development office indicated that special collections personnel had not been involved. Six libraries, two of which spend over $100,000 per year for rare books, reported that the entire fund-raising effort for rare book acquisitions funds was conducted by special collections personnel. Five of these libraries are academic (four public and one private) and the sixth is a public library. Two independent libraries whose acquisitions consist primarily of rare materials stated that fund-raising efforts for rare book acquisitions had not benefited from the presence of
a development office and had involved virtually the entire library staff. As one respondent characterized the situation: "We did it all!"

Regardless of whether or not there have been fund-raising efforts for rare book acquisitions funding in the past five years, 86 percent of responding libraries (seventy-nine of ninety-two) stated that support groups such as a Friends of the Library organization contribute in some measure to the purchasing of rare books. However 90 percent of the respondents reporting that they receive funds from support groups stated that less than half their acquisitions funds for rare books are derived from that source. Six libraries stated that such support was virtually nonexistent or was only an "occasional" or "ad hoc" source of funds for rare book purchases. The 10 percent of those libraries which receive more than half their rare book acquisitions funds from support groups are all academic libraries with the exception of one independent library. Only one library in the entire survey stated that its entire source of rare book acquisitions funds is derived from a support group. Three of the six libraries which reported that over half their rare book acquisitions funds are provided by a support group spend over $50,000 per year on rare books. The single library which relies exclusively on support group funds spends under $10,000 per year on rare books.

Even though most of the libraries surveyed have not undertaken a fund-raising effort benefiting rare book acquisitions during the past five years, several of the respondents who have been involved in such an effort, or are planning one, provided interesting commentary. One respondent wrote that a "campaign will soon be undertaken to raise funds for rare books and special collections. This will be a part of a larger campaign and benefit all parts of the library. Although the fund raising effort will be guided by the University Development Office, Special Collections staff and other library personnel will be involved."

Another respondent from an academic library wrote that a fund-raising effort for rare books had been undertaken within an institutional context rather than a library context. He stated that: "The Development Office requested proposals for new fund raising efforts. Our proposal was one of a few selected. The Head Special Collections Librarian wrote the description and rationale for the project." A third respondent from an academic library reported that his library is currently engaged in a campaign, conducted jointly by the library and the university development office, to raise $3 million for new endowments for library acquisitions. The campaign, begun with a $750,000 challenge grant from the National Endowment for the Humanities, will add new endowments not only for the general collections but for rare books and special collections as well.
Acquiring Rare Books

Other respondents wrote that grants served as the basis for new rare book acquisitions funding and several noted the role of deaccession as well. One respondent in a public library wrote that because of other library priorities, fund-raising for rare book acquisitions had been left entirely to special collections staff; one method that had been successfully employed was an auction "in which duplicates of material in Special Collections were sold and the monies earned became an endowment for the use, only, of the Special Collections Division." The director of an independent library enclosed a recently developed policy regarding rare book acquisitions. It reads in part: "Monies for the acquisition of collection materials will be drawn from an Acquisitions Account, which will be set up as a part of the [library's] "capital fund" (as distinct from the "operating fund"). Proceeds from the deaccession of collection item(s) will be credited to the acquisition account, as will all cash gifts made specifically for collection purchases."

Despite the high number of libraries that receive less than half their rare book acquisitions funding from support groups, a sizable number of respondents seem to be relying on such groups for increased funding, in some cases quite successfully. One respondent noted that "our very active Friends group has an annual book sale that netted $40,000 last year; much of this is available for rare book purchases." A second respondent noting that support group funding is of considerable value but is not a panacea, wrote that "current FY support [Friends] represented about 20% of monies spent by Special Collections or about 10% of the overall Library expenditure in this area." The same respondent added that the "Friends of the Library, which began in 1977, has only had significant effect on rare book purchases during the past 5 years, however, with contributions of over $10,000 towards purchases made during the 85/86 FY."

In raising additional funds for rare book acquisitions, numerous respondents emphasized the importance of general administrative support to the efforts' success or lack of success. Perhaps the most persuasive statement was made by one of the few survey respondents who is also the library director:

Interest and support by members of the Board of Trustees, the President and other persons of stature is paramount to successful fund raising for book acquisitions. Often this is a result of the personal relationship which is cultivated and nurtured by members of the library administration with these individuals. [In such efforts] no task should be considered too small or too lowly by the library administrator.
What of the Future?

The final question of the survey asked respondents to state whether they are optimistic about the future growth of their rare book collections based on the present state of their library's ability to purchase rare books. Of 122 responses, 68 were positive (56 percent), 27 of 122 responses were positive with qualifications (22 percent), and 27 were negative (22 percent). All three groups contain large and small, public and private academic libraries, public libraries and independent libraries, and all three national libraries gave positive responses. Not surprisingly, twenty-three of the libraries giving negative responses spend under $50,000 per year on rare books; of the twenty-three, thirteen spend under $10,000, seven spend between $10,000 and $24,999, and two spend between $25,000 and $49,999 (one library did not specify a spending range). Only four libraries, all academic, spending over $50,000 per year gave negative responses; one of these spends over $100,000 per year on rare books. Again not surprisingly, of the ninety-five libraries giving either positive responses or positive responses with qualifications, thirty-eight spend over $50,000 per year for rare books; this figure constitutes 88 percent of the total number of libraries that spend over $50,000 per year in rare books. However 55 percent of those respondents optimistic or optimistic with qualifications about the future (fifty-two of ninety-five) were reporting from libraries that spend under $50,000 per year on rare books; five libraries in this group did not specify a spending range. Fourteen of the fifty-two libraries spend between $25,000 and $49,999 per year on rare books, sixteen spend between $10,000 and $24,999, and twenty-two spend under $10,000 per year.

Most of the respondents who reported that they are not optimistic about the future growth of rare book acquisitions by purchase cited as their reasons a static budget or a declining budget in the face of other library or institutional priorities. In particular, there is concern that library and/or institutional administrators are unenthusiastic about, or are opposed to, new efforts at fund-raising for rare book acquisitions. As one respondent noted: "I can derive some sense of satisfaction at the progress I have made here considering the conditions and attitudes prevailing at the time of my arrival. But, I have an abiding frustration because of the College administration's seemingly intractable position with regard to Library development in general." Another, somewhat more optimistic, respondent wrote that "if there is a library and University commitment to strong Special Collections, very positive steps can be taken. Right now, there is library support—and Foundation
Acquiring Rare Books

support—but not much enlightenment within the University administration....As our Academic Vice President said to the library—'As long as I can find Chemical Abstracts, I don't need you.'"

Other respondents who were either pessimistic or only guardedly optimistic cited competing priorities within special collections as their cause for concern. One respondent stated that “issues of cataloguing, space, and preservation threaten to muddle, overwhelm, and terminate attempts to improve and enrich historical collections in this country.”

Writing to the same point but in more detail, a second respondent commented that

what most keeps me within...bounds[ in purchasing rare books] is the library's perennial short-staffing, such that Special Collections and Rare Books has one professional librarian—me—and one high-level classified staff assistant. The result is that I have a limited amount of time to review rare-book catalogs and select materials. Part of the limitation is that...I have to catalog them, too....As it is, I have not yet learned how to select and acquire no more items than I can catalog—and so the backlog grows....In short, I am confident that as available funding now stands, I could spend a good deal more time than I do for acquisitions, but I see no point in simply accelerating the rate at which the backlog increases.

On a more optimistic note, several respondents described an increase in their ability to buy rare books, usually in terms of new initiatives to expand acquisitions funding. One noted that “in general, the situation for rare books at [my institution] has improved dramatically over the past five years. The one area in which we are deficient is in endowed funds. This is not due to lack of interest on the part of the Library, but rather a general neglect of the Library by campus development. This will be changing, however, with the hiring of a new Vice Chancellor for University Relations.” In an even more enthusiastic response, one respondent wrote that:

I am particularly encouraged on two fronts. In recent years, Special Collections (which includes rare books) has been given 5% of the library's total acquisitions budget which is comprised of both endowments and annual appropriations. Even with the fluctuations of inflation, knowing that we have a base budget for acquisitions means that we are able, really for the first time, to build our collections systematically. In addition, Special Collections is one of the beneficiaries of a multi-million dollar library campaign that has as its sole purpose the establishment of new endowments for acquisitions. With luck, we will have in excess of $200,000 per year to spend on Special Collections materials in a couple of years. This compares with about $25,000 per year just 5 or 6 years ago.
Appendix A
Survey of Special Libraries

1. Does your library currently purchase rare books? __________
   A. Does the Special Collections unit of your library purchase rare books? __________
   B. Do language and/or subject specialists purchase rare books which are placed in Special Collections? __________

2. If the answer to 1A is yes, is the total spent annually for the purchase of rare books, under $10,000? $10,000-24,999? $25,000-49,999? $50,000-74,999? $75,000-99,999? over $100,000? __________

3. From what sources are rare book acquisitions funds in your library derived? Check as many as apply.
   A. Endowments ______
      1. restricted ______
      2. unrestricted ______
   B. A portion of the library's annual appropriation ______
   C. Special appropriations from the library's discretionary funds ______
   D. Funds provided by support groups, e.g. Friends of the Library ______
   E. Other ______________________________ . Please specify.

4. Has the rare book acquisitions budget in your library increased every year since 1980? ______

5. Is the total rare book acquisitions budget in your library less than 5% of the total library acquisitions budget? ______ Greater than 5%? ______ Greater than 10%? ______

6. Is the rare book acquisitions budget of your library insufficient? ______ satisfactory? ______ ample? ______

7. Is your library's ability to purchase rare books equal to what it was in 1980? ______

8. If not, is this because of any of the following factors? Check as many as apply.
   A. Inflation in prices for library materials in general ______
   B. The price of rare books has increased at a rate greater than library materials in general ______
   C. A rare book acquisitions budget that has remained static ______
   D. A rare book budget that has been cut ______
   E. Diversion of rare book acquisition funds to other priorities within Special Collections ______
Acquiring Rare Books

1. Acquisition of other research materials for Special Collections, e.g. manuscripts, reference works
2. Staff salaries
3. Equipment budget
4. Supply budget
5. Support services, e.g. automated cataloging charges, online catalog costs etc.
6. Other. Please specify.

9. Has your institution undertaken a fund-raising effort to increase acquisitions funds for rare books in the past 5 years?

10. Has a fund raising effort to increase your library's rare book acquisitions budget been undertaken in the context of a larger library or institution campaign?

11. Was the effort undertaken by your institution's Development Office? If so, was the Special Collections staff involved in the effort?

12. Was the effort undertaken by the library not in concert with the institution's Development Office? If so, was it conducted by the library Development Office? By Special Collections staff? Other library staff? (specify)

13. Does a support group, e.g., the Friends of the Library, provide your library's entire rare book acquisitions budget? More than half? Less than half?

14. Given the present state of your library's ability to acquire rare books by purchase, are you optimistic about the future growth of your rare books collection?

15. Include below any other comments or observations you wish to make regarding the acquisition of rare books in your library.
## Appendix B

LibrariesResponding to Survey*

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<th>College/Institution</th>
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<tr>
<td>Allegheny College</td>
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<td>American Antiquarian Society</td>
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NEH Support for Special Collections

MARGARET S. CHILD

It has become almost a truism that American librarianship has undergone a revolution in the past decade. A number of forces have been at work impelling rapid change, but the introduction of computers is usually identified as the prime mover in this revolution. The penetration of automation to every corner of the library, including many rare book rooms, and the many revisions of day-to-day operating procedures which it has brought about have been much discussed. Little or no systematic attention, however, has been paid to another force which, from the mid-1970s on, intersected with the rise of the computer and reinforced some of automation’s most significant effects as well as helping American libraries to move forward on a number of other fronts. This force was the availability of federal grants for library and archival projects. The Research Collections Program of the National Endowment for the Humanities (NEH) was formally established in the summer of 1974; the NEH Challenge Grant Program made its first official awards in 1977; Title IIC of the Higher Education Act was authorized in 1977 and began making grants in 1978; and the Records Program of the National Historical Publications and Records Commission (NHPRC) was written into law in 1974, staffed in 1975, and made its initial awards in 1976. An in-depth and comprehensive analysis of the impact of the tens of millions of federal dollars which have been channeled from these sources over the past dozen years into organizing, preserving, and making more accessible the holdings of this country’s research libraries, archives, historical societies, and other

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repositories is much needed. This article is intended only to suggest some of the themes which such a study might pursue and to provide an impressionistic, limited, and admittedly personal overview of one segment of the subject—i.e., the grants made by one of the federal agencies, NEH, to one segment of the library and archival community—rare book libraries and special collections.

To begin with a little history, there were three main antecedents to the decision by the NEH administration to break out a specific funding line for research collections from the budget of the Division of Research. The first was a general and growing awareness that the entire range of projects supported by the agency through all its divisions from fellowships to public programs ultimately depended to some extent on the use of research materials in the humanities. This realization was prompted by the fact that a steady stream of proposals was being received which had as their first stage some attempt to make such sources available. There were also a number of other projects being submitted simply to arrange and describe, catalog, preserve, or otherwise make collections available because they could be shown to be potential building blocks for humanistic research. Second, in the early 1970s there was also increasing interest in state and local history as part of the preparations for the celebration of the Bicentennial, and many of the source materials relating to the events of the Revolution in various localities were totally inaccessible. Finally, the Independent Research Libraries Association (IRLA) made a direct approach to the chairman of NEH to ask for help to stem the side of at least some of its members into deficit financing. This request prompted the preparation of an internal staff report that examined the financial history of several IRLA member libraries over the past decade and concluded that their plight was real, serious, and deserving of outside assistance.

Thus, at the inception of the program, special collections in general and rare book libraries in particular were assumed at least implicitly to be its primary clientele. Administrative decisions at the division level, such as the separation of research collections from research tools in July 1975, as well as the specific interests and objectives of successive NEH chairmen and their staffs, from time to time turned the program in new directions. The further evolution of the program was, however, shaped primarily by an ongoing interaction between prospective applicants and the program staff. To a large extent a funding program is like any business; it is responsive to its market. The kinds of proposals received, the information and opinions provided by the constituency in reviews, on panels, at professional meetings, and in visits to program staff, all contribute not only to decisions on what is to
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be funded in any given cycle but also to revisions of the guidelines, to the information given to prospective applicants, to the kind of personnel recruited, and indeed to the attitudes and emphases of staff. Thus, although it was several years before a staff member with specific experience in rare book librarianship joined the program, that segment of the library community participated in the symbiotic relationship between the program and its market from the very first.

A similar pattern lies behind the establishment of the Challenge Grant Program three years later. The financial difficulties of the IRLA libraries, especially of the New York Public Library, and of a number of other important cultural institutions, such as museums, were the primary impetus behind the desire by both endowments to create a new type of program. In general, the addition of the challenge grant authority to their enabling legislation marked a recognition by both agencies and by Congress that project support alone was insufficient to ensure the financial health of key institutions: universities, colleges, museums, public libraries, public broadcasting stations, humanistic research centers, institutes, associations, university presses, historical societies, research libraries, etc. In fact, the experience of Research Collections had suggested that a project grant often increased the operating expenses of the recipient institution. Not only did the institution have to bear the cost of planning the project and contributing substantial sums in cost-sharing, but it was left with the ongoing expense of maintaining, servicing, and preserving the collections organized under a grant. Meanwhile, the operating costs of institutions were rising rapidly in the inflationary climate of the 1970s, and income from conservatively managed endowments was simply not keeping up. Challenge grants were devised as a means of helping institutions to help themselves: by providing operating funds to tide them over immediate financial crises, by increasing their endowments through fund-raising in the private sector with the incentive of a NEH grant to spur contributions, and by reexamining the ways in which their endowments were invested and managed.

The Division of Research itself and its subsequent Research Collections Program had been making matching grants to the New York Public Library since 1972, with the match required increasing to two to one in the later grants. Although various activities of the library were highlighted in each of the proposals, these grants were basically for ongoing operational support to enable the library to weather New York City's own fiscal crises and to stay in the forefront of the nation's libraries. In addition, in 1976 the program made three "experimental" awards—to the Massachusetts Historical Society, the Maryland
Historical Society, and the Newberry Library—to test the challenge grant concept, particularly the capacity of research libraries and historical societies to raise significant sums of money successfully. Over the decade since the inception of the Challenge Grant Program, a number of the nation’s leading rare book libraries have been transformed by the infusion of funds stimulated by this award program. Many have undergone extensive physical renovation or expansion. Their collections have benefited from the installation of modern climate control systems and the construction of sophisticated conservation laboratories manned by trained staff. Staff salaries have been raised, and more highly qualified personnel have been recruited. They have become the sites for expanded educational programs undertaken either with their own resources alone or in conjunction with universities and colleges. Similarly, they have expanded “community” programming directed to children, young people, and adults. Finally, many now have their own highly professional fund-raising offices or participate actively in the development efforts of the larger institution of which they are members.

It should not be assumed that these grants have gone only to the best known institutions. A significant number of small- and medium-sized college and university rare book rooms, public libraries, and special libraries have also received challenge grants for the same purposes as have their more famous fellows. Perhaps the most important result of the Challenge Grant Program has been the realization that it is indeed possible to raise money—often very large sums of money—for libraries and particularly for rare book libraries. Some of this might have happened anyway as part of the trend toward the “marketing of America” described in the popular press, but the challenge grant program provided a substantial incentive for institutions, which had traditionally kept a very low profile, to join that trend.

Although a similar evaluation of the impact of the awards made by the Research Collections Program would probably not show the same kind of dramatic changes which can be hypothesized for challenge grants, nonetheless a more systematic study than is attempted here would undoubtedly provide illuminating insights into the relationship of federal funding to the evolution of American rare book libraries and librarianship during the past decade. The research for this article has not included such an in-depth analysis, chiefly because it soon became apparent that digging out the essential information from the grant files would be a massive undertaking. Any such study should also be based on more than the official files. In addition to an examination of the original proposals and final narrative reports submitted by each
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grantee, it should include a survey of the directors and/or staffs of the several projects to determine their actual long-term results. Only by doing this kind of follow-up can a conclusion be reached about whether or not the grants actually accomplished what they were intended to.

In order to expedite this laborious process, brief descriptions were reviewed of all the grants related even indirectly to the development of rare book librarianship made from its inception to the present by the Research Collections Program. Each was assigned to one of eight general categories. An attempt was then made to consider, albeit impressionistically rather than systematically, how these projects had affected both individual institutions and the field in general. The awards have been appraised both individually—especially in the case of some pioneering awards—and cumulatively. In selecting these grants from the total made by the program during the period, a broad definition of rare book libraries was used. Included were all projects dealing with materials which would normally be housed in a rare book room or administered by a special collections department. In some instances it was difficult to know what to do with “level five” collections as defined by the Research Libraries Group (RLG) conspectus, but for the most part they have been included. The categories into which the grants were grouped were: manuscripts; rare books per se; comprehensive collections on a specific subject or area, i.e., “level five” collections; ancient records (papyri, tablets, etc.); and microforms of any such materials. All of these were, at heart, cataloging projects. Then there were bibliographies, guides, indexing projects, or databases providing access to such materials; projects to conserve or preserve same; and projects intended to advance the overall field of librarianship which impacted at least in part on rare book libraries. It was also at times difficult to make an assignment along the grey borderline between manuscripts and archival collections. Again the tendency has been toward inclusiveness although twentieth-century materials have in general been excluded. Also excluded have been photographs, films, artifacts, oral histories, sound recordings, and architectural records.

As has already been suggested, the initial thrust of the program and the meat and potatoes part of its diet came from the cataloging projects. Program staff often thought of these as efforts to clean out the attics or to empty the boxes in the basements of the repositories concerned. To some extent they were just that, although the attics and basements always had to be shown to contain materials of demonstrable significance to humanistic research. It should also be noted that fairly early on, the program established a policy that the collections, for which funds were being sought, could not have been purchased because the institution
was expected to process those from their own resources. The strongest applications were those in which the collections had been acquired many years earlier under a previous administration in something resembling a fit of absence of mind. Well-run modern institutions were assumed to be sufficiently strong minded not to solicit and certainly never to accept collections which could not be cataloged within a reasonable period of time using the institutions' own resources or additional funding obtained as part of the gift.

There is a veritable profusion of riches under the "catalogs" rubric, be they rare books per se or "level five" collections—the early children's books at the Morgan Library, the 17th and 18th century American printed broadsides at the American Antiquarian Society, the University of Tulsa McFarlin Library collection of 8000 publications written by and about native Americans, the James Weldon Johnson collection at the Beinecke Library at Yale, the Yiddish book collection at the YIVO Institute for Jewish Research, the collections at the Kinsey Institute at Indiana University, and the Mennonite Historical Library of Goshen College. This brief sampling provides an indication of the range and depth of print collections brought under bibliographic control by these awards. In some instances, these projects resulted in a published catalog; from the latter 1970s onward it was customary to require that the records be entered into a national bibliographical network.

The same kind of treasures could be cited for the manuscript collections. In both categories, there were a considerable number of grants to gain control over all, or a substantial portion of, the rare holdings of an institution. The medieval Spanish manuscripts at the Hispanic Society of America, many of the manuscript collections in the Massachusetts, Pennsylvania, Virginia, and Delaware historical societies, the Tibetan texts of the Field Museum in Chicago—these are typical of the manuscript materials cataloged with the help of NEH awards. Many of these projects also resulted in the publication of guides to the collections, in the better preservation of the materials themselves through refolding, boxing, and conservation treatment as well as in occasional microfilming, both for preservation and better access. In a few cases, grants were made to catalog manuscripts in institutions outside the United States, for example in one of the monasteries on Mount Athos in Greece. The rationale here was that publication of a catalog would facilitate research by American scholars and indeed that it might be useful to know what was there even if direct access was difficult. In a number of other instances, the collections cataloged were microfilms of foreign manuscripts such as the Florida Borderlands
collection of microforms of Spanish documents at the University of Florida.

Almost inevitably, as each cycle produced its crop of similar applications and as experience was gained in evaluating them and preparing the conditions for an award, the issue of standards began to arise. This was in part dealt with informally. Strong proposals served as models; staff from one project acted as consultants to others; the program's guidelines were made more explicit. The introduction of automation and the obvious advantages of inputting to a national database records produced under a grant, provided further justification for demands for uniformity of practice. These pressures impacted most strongly on archival and manuscripts projects in which the formats of catalogs, finding aids, and guides were carefully scrutinized by reviewers, panelists, and program staff. These led eventually to two grants in 1980 and 1981 to the Society of American Archivists (SAA) for the development of the MARC archives and manuscripts format by Richard Lytle and David Bearman. The same pressures prompted an award in 1980 to the Council of National Library and Information Associations to underwrite some of the costs of having three Library of Congress staff members prepare comprehensive cataloging manuals for graphics, manuscripts, and motion pictures and video recordings.

A similar effort was undertaken by IRLA under the leadership of Marcus McCorison of the American Antiquarian Society on behalf of the rare book community. IRLA received a small NEH award in 1979 to enhance the MARC II format to accommodate the special bibliographic information of particular interest to rare book librarians and scholars using such collections. Although only a few of the recommended additions to the format were initially approved by MARBI, the cause has subsequently been taken up by the Standards Committee of the Rare Books and Manuscripts Section of the Association of College and Research Libraries (ACRL).4

The development of standards was, however, never a primary objective of the Research Collections Program, but rather simply a way to help ensure that funds would be efficiently employed and that the results of a project would be usable by the entire community. The whole process of advising an applicant was also of course a good deal easier if one could simply point to a standard and say, "follow it." Nonetheless, it should be stressed that the goal of the program was first, last, and always simply to make research resources available for use by scholars in the humanities, and all other projects were important only insofar as they were a means to that end.
Along with the cataloging and processing projects already described, bibliographies and guides were also seen as ways of making humanistic sources more accessible for scholarly use. Programmatically, these were part of Research Collections at its inception; they were then administratively shifted to Research Tools; ultimately they rejoined what eventually became Research Resources. This category is probably best exemplified by two massive projects which have sent their missives and, on occasion, their emissaries into every rare book library in the United States: the *Eighteenth Century Short Title Catalog* (ESTC) and the North American Imprints Project (NAIP). Both were natural outgrowths of earlier efforts, the revisions of Pollard and Redgrave and of Wing (both also underwritten by the Research Collections Program of NEH), and of the American Antiquarian Society’s ongoing efforts to bring all of its holdings under bibliographical control. Each has been a model of both national and international cooperation. They have also served as stimuli to institutions throughout the country to catalog their holdings from these periods. The ESTC database is now of a size to make it a valuable tool for identifying bibliographic entities and for doing research on a particular topic. More than 30,000 NAIP records, representing the holdings of the American Antiquarian Society have also been loaded into the Research Libraries Information Network. In contrast to ESTC, these are full MARC records including some of the added fields for rare book cataloging referred to earlier. Eventually, all the NAIP records from both the society and other contributing libraries will be included in the ESTC file, an event expected to occur at the end of 1988. In addition, the NAIP project has received a Title IIIC award to add subject headings to all the records contributed by other libraries and match them with the Readex microprint edition of the publications themselves. Thus this project too will ultimately provide an extraordinarily useful and lasting foundation for all research using bibliographic information on American imprints up to 1800.

Concentration on the two Goliaths in this category should not lead one to ignore the other kinds of useful projects which were also funded: bibliographies of the works of individual authors or of types of publications such as late nineteenth-century American law books; guides to manuscripts on certain topics, such as manuscript sources of Renaissance polyphonic music; or of specific kinds of manuscripts, such as fifteenth-century Spanish poetry. An impressive array of standard reference works has been produced and is presumably making the daily operations of rare book and special collections librarians...
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throughout the country easier as they seek to answer reference queries or
direct patrons to useful collateral material.

Another mechanism identified early on in the program's history as
a way of enriching and making more accessible the corpus of research
sources available to the American humanist was microfilming. Some
fifteen projects were funded to film materials in foreign repositories and
in a few instances in private hands. These ranged from replication of
materials relating to a single individual—Giuseppe Verdi, for the
Archive of the American Institute for Verdi Studies at New York
University—to a series of grants made over almost fifteen years to
underwrite both the acquisition of additional films and their cataloging
for the Hill Monastic Manuscript Library at St. John's University in
Collegeville, Minnesota. Another decade of support went to Walter
Harrelson of Vanderbilt University to film the earliest manuscripts of
Ethiopian orthodox churches and monasteries. Copies of these films
were also deposited at the Hill Library where they were cataloged and
made available for use by American scholars. Given the ensuing politi-
cal problems of that country, this may indeed have been a rescue mission
of great importance to a number of fields of study. Grants were also
made to film materials already in American repositories, both to pre-
serve them and to make them more accessible through loan or sale of the
film. One of the earliest such awards was to the Leo Baeck Institute in
New York City to film its holdings of nineteenth- and twentieth-century
German Jewish periodicals. Another supported the filming of the
Indian Archives of the Oklahoma Historical Society. Awards were made
to the Houghton Library at Harvard for three very different projects:
(1) processing and filming the Archives of the Republic of Georgia;
(2) filming the library's accession records and manuscript indexes both
for preservation and reporting to The National Union Catalog of
Manuscript Collections (NUCMC); and (3) filming its early manu-
scripts and photographing their illuminations in order to reduce the
need to handle the originals and thus help to ensure their preservation.

These and some dozen other awards made during the 1970s and
early 1980s laid the foundation for the establishment of the Office of
Preservation in early 1984. In addition to the benefits to the grantees,
they served to familiarize NEH program staff and administrators with
the preservation issue and to contribute to the growth of a preservation
movement in the nation's libraries and archives. It might even be
claimed that this series of NEH grants was crucial in creating the
infrastructure which made possible the current explosion of concern
about preservation of library materials as well as the concomitant
appointment of preservation officers and the establishment of preservation programs in a rapidly increasing number of institutions. For example, there was the series of grants which explored the feasibility of, established and then supported the training program for conservators and preservation administrators at Columbia University. Even before that, a 1979 award to Yale University to survey its collections, to train interns, to prepare disaster plans, and to improve both storage and treatment of its holdings provided a cadre of trained technicians, many of whom are still active in the field, and a model program which remains the envy of other research libraries. It also provided the best data available to date on patterns of deterioration. Similarly, the creation of a field services program at the North East Document Conservation Center (NEDCC) in 1980 has made possible the gradual education of an entire region's repositories to preservation issues, remedial measures at scores of institutions, and again, the creation of a model program for other regions to emulate. Nationally, the spin-off from the Association of Research Libraries' (ARL) 1979 award "to design and test a self-study procedure to identify and address preservation problems" continues in institution after institution. The 1981 grant to the Research Libraries Group to develop a cooperative preservation microfilming program has had an almost equally wide ripple effect. Even some small grants, such as that to James Reilly of the Rochester Institute of Technology to develop and evaluate new preservation methods for nineteenth-century photographic prints, have been and will continue to serve as basic underpinnings for this developing field.

The final category to be considered is again a small but influential number of grants which stimulated the growth of automation in American libraries. Like the preservation awards just mentioned, these were intended to be of benefit to all libraries. Although some individual projects were of more immediate interest to rare book libraries than were others, it is probably safe to say that all of them have affected or eventually will affect the way in which most rare book libraries function. This aspect of the program got underway in late 1975 and early 1976 with grants to Stanford University for what was then the university libraries' online automation system—BALLOTS—to support multiinstitutional services and to the original RLG for development of its automated capabilities. These were followed in 1977 by the first of two awards to the University of Chicago for further development of its library data management system. In the same period, a large matching grant went to the Library of Congress to edit the bibliographic data for humanities serials being contributed to the CONSER database on OCLC. Throughout the late 1970s and early 1980s the program con-
continued to support the development of particular automated systems. These awards, however, were soon clearly focused on those which offered the potential for serving a nationwide community of users. The Bibliographic Standards Development Program of the Council on Library Resources, which received one of the largest matching awards ever to be made by the program, was intended to develop standards and mechanisms to facilitate improved coordination among systems with the goal of ultimately linking the several networks with each other and with the Library of Congress. Support for RLG moved from the early development of BALLOTS and RLG's own automation projects cited earlier to funding for the development of a capability to include records in East Asian characters (1980) and other non-Roman characters (1982) in what had by then become the RLIN database. Of more immediate interest to rare book and special collections librarians was the series of grants made first to SAA (see earlier discussion) and then to RLG which resulted in that utility's bringing up the MARC archives and manuscripts format and thereby making possible the development of a database of collection-level descriptions.

Cumulatively, these grants permitted custodians of archival and manuscript materials to enjoy for the first time the possibilities of rapid access to information on the holdings of other repositories available for many print collections. This in turn has encouraged individual institutions to rethink their collection development policies with an eye to holdings elsewhere just as libraries are doing. As already noted, automation inevitably promotes standardization of practices and procedures far beyond the simple entry of information in a standardized format, and archival and manuscript repositories are only now beginning to deal with the ramifications of these pressures on what have heretofore been highly idiosyncratic operations.

What then has been the result of the expenditure of so many taxpayer dollars on the particular segment of the nation's cultural resources represented by rare book libraries and special collections? First, the big "blockbuster" projects might well never have been undertaken, especially those requiring extensive use of costly automation equipment and the creation of a quasi-permanent administrative structure both to run the project and to deliver the successive grants necessary to keep them alive. Similarly, the massive renovations and additions underwritten at least in part by challenge grants, such as those of the Folger, the John Hay, and the Newberry libraries, might not have been attempted, at least on such a comprehensive scale. The most striking overall effect, however, has been the speeding up of changes which would in all likelihood have occurred eventually anyway. Federal dol-
lars have served as a kind of fertilizer to spur growth in a number of
directions. Automation and preservation are good examples of move-
ments which would eventually have affected all libraries but which
came more rapidly and had broader immediate impact because of the
availability of federal money to ease their introduction and implement-
ation. It should also be noted that the old maxim, "Money breeds
money," applies to the public as well as to the private sector. Even before
challenge grants, the fact that the federal government was supporting
library projects provided an entrée for library administrators to private
funding sources. Indeed, the matching mechanism, which NEH used
from the start, encouraged the raising of private dollars to match the
federal award. Moreover, many private foundations and individual
donors were willing to accept the very fact of a NEH award as a
justification for their also providing assistance, particularly as the rigor
of the NEH review process became known and respected.

One could also count up a veritable host of specific "products"
which resulted from NEH grants. Certainly, more collections are under
bibliographic control, and intellectual access to many of them is easier
from afar through published catalogs and guides as well as via OCLC
and RLIN because of NEH support. This in turn has promoted greater
use of materials which were previously inaccessible both literally and
figuratively. It would be interesting to know the extent to which the
increase in readership at given repositories is due to their collections
being more widely known, again because of such grants. Even more
interesting would be an attempt to track the intellectual trail of mate-
rials made accessible by such funding through lectures, symposia, and
publications.

In addition, the same and other collections are often better housed
and maintained, thanks in particular to challenge grant funded renova-
tions and improvements in climate control as well as to better treatment
in general because of greater awareness of preservation considerations.
Some materials are indeed benefiting from the ministrations of profes-
sional conservators working in laboratories built with challenge grant
monies or of preservation administrators trained with NEH support.

Furthermore, federal funds have allowed and even encouraged
many of these libraries to assume a higher profile in their communities
by helping to underwrite the costs of exhibitions and special programs
aimed at wider audiences than those traditionally cultivated. Moreover,
the simple fact of fund-raising has made them "go public" in a way
previously unknown. Federal funding is best justified when it is used to
meet a public need or serve a public good. Therefore, applicants to NEH
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were always asked to demonstrate that their projects would produce "public" benefits. There was a general expectation that the projects would be models which others could emulate, that they would conform to standards so that results would be generally useful, and that they would enter into cooperative agreements to share products and information. These pressures were instrumental in shifting the focus of attention of rare book libraries outward and thereby changing them fundamentally. To use a well-worn but nonetheless useful cliché, they are no longer backwaters but have been drawn into the mainstream of American librarianship, into greater participation in the intellectual life of the country, and into a more active role in their communities. Of lesser significance but still important were some other assumptions which underlay much of the grant-making done by the Research Collections Program. Staff, reviewers, and panelists were typically American in believing that professionalism is better than amateurism, that new is frequently synonymous with better, and that progress is best assured through technological innovation. Although a thorough exploration of the full implications of these articles of faith would take another entire paper, suffice it to say here that each of these was to some extent at variance with the traditions of rare book librarianship in this country so that in those respects the effect of NEH grant-making was again to change the characters of the recipient libraries by encouraging the new and at times doing this at the expense of the old.

References

1. For the sake of clarity, the name "Research Collections Program" will be used throughout this article although it has been changed a number of times most recently to Reference Materials/Access.
2. I should like to thank Wanita Sage-Gagne, a student in the M.L.S. program at The Catholic University of America, for her assistance in doing the initial sorting of the grants into categories.
4. An excellent recent article covered clearly and succinctly the effort to make the MARC format more useful for rare book cataloging. See Flannery, Melissa C. "A Review of Recent Developments in Rare Book Cataloging." *Cataloging & Classification Quarterly* 7(Fall 1986):55-62.
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Conservators and Curators: A Cooperative Approach to Treatment Specifications

BONNIE JO CULLISON
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This paper is about responsibility, communication, the physical conservation of historically significant items, and the preservation of their meaning. Its underlying premise is that although we have made significant progress in our methods of treatment and our attitudes toward these materials, we have not yet arrived at a point where curators, conservators, and scholars grasp the relevant complexities involved in their preservation. In academic and research institutions with rare book or special collections holdings there is a growing recognition of the necessity for a continuous process of mutual education and communication between the curator and the conservator. The trend is toward a more cooperative approach in determining how—and how not—to treat a rare book. Through dialogue, curators and conservators are recognizing that they share a key professional end, albeit one that they pursue from different directions, which is the maintenance of materials for as long as possible in the best condition possible. Here “best condition” means the retention of an item in a state as close as possible to unaltered, preserving as much as possible of its original form and meaning without jeopardizing its longevity.

There are several reasons why the idea of a cooperative approach toward treatment specification is growing. Perhaps one of the most obvious is the acceleration of the amount of conservation activity itself.

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Administrators of research collections are confronting the inevitable—i.e., that their collections are composed of organic materials and it is only a matter of time before the contents of their libraries disintegrate. In increasing numbers, they are deciding that the time to begin preserving their collections is now, not in some dim budgetary future. Witness the number of preservation programs being established across the country, the expansion of existing regional conservation facilities and the services they offer, and the establishment of more and more in-house treatment facilities on both a large and small scale.

In the past, many libraries with no formal preservation programs did provide their rare book and special collections access to conservation treatment resources. Now, however, the preservation programs supported by research libraries include general collections as well, thereby significantly increasing the pool of candidates for conservation treatment. Even in smaller local libraries, archives, and historical societies, the means to conserve items of special importance are being found through programs funded by grants, private donations, and government allocations. Though these institutions may not have their own treatment facilities, they can use the services of regional centers or the growing number of private conservators. The bottom line is that conservation treatment is now accessible to more collections than ever before. This means that more curators and conservators are assuming responsibility for determining the appropriate conservation treatment of more material.

Another reason for growing efforts at better communication between curators and conservators is the increasing consciousness of both professions that any intervention may, in fact, obliterate characteristics of an item which could have research or historical significance.

A codex book is an object constituted of multiple and separate components; gatherings, binding construction, metal furniture, fastenings, etc. Combined, these form numerous subtleties of historical interest and theoretical evidence, indicating period fashion and provenance; divided, they lose much of their meaning and power to conjure human thought. Bibliographical integrity is not something one can dismantle and recreate. Judged in this way the integrity of the individual volume is only as strong as its most fragile or weakest part; as with a painting, when only one color may fade but the artist's intention is altered for ever, the integrity is fragmented.

Ferguson points out that even the patina of age imposed upon a book as it passes from place to place and owner to owner is a record of historical significance.
For both curators and conservators this increased preservation activity has highlighted areas of weakness in their professional training programs. In the past, book conservators have tended to be craft or "fine" bookbinders, trained in English or European trade binding shops with little, if any, exposure to the "scientific, historical or aesthetic aspects" of the composition of books and documents. And, as Christopher Clarkson, conservator of the Bodleian Library, points out "the present European conception of bookbinding is being misapplied when imposed on pre-18th century European books or on books from alien cultures. The thoughtless application of late European bookbinding traditions have caused immense damage to cultural property throughout the world."

The inadequacy of this training for the job of preserving historical integrity has been bemoaned by a few conservators for many years. In 1967, Paul Banks, then conservator of the Newberry Library in Chicago, expressed the need for the development of a profession of book conservation that would combine the scholarly orientation of the curator, the pure research training of the scientist, and the artisan skills of the bookbinder. Several years later, Peter Waters voiced the need for the training of conservators to become more qualified for the responsibility of treating "old books." A conservator should be, in his estimation, "scholarly, with a broad knowledge of librarianship, mathematics, chemistry and physics, the history of culture, and of book technology, who also has had a sound practical training in restoration." He proposed an international training center for book and archives conservation which would include courses on conservation and materials science; history of art; history of book technology; art conservation theory; documentation and bibliography; study of the book in relationship to restoration practice, insofar as it affects the scholar, scientist, restorer; and paleography, in addition to the standard subjects such as the causes of deterioration of library and archives material, environmental storage, and restoration and repair techniques. Significantly, the center was to be designed not only to train conservation technicians but also to create an environment in which librarians, archivists, scientists, scholars, administrators, and students could pool their knowledge and "create a unity of understanding and purpose hitherto unattainable."

On the other hand, librarians with curatorial responsibilities have traditionally received their training in an M.L.S. program and/or hold subject masters and Ph.D. degrees. In few cases has their education included more than a rudimentary introduction to the preservation of
books and paper, let alone any exposure to actual conservation techniques. They too are recognizing the necessity of better academic preparation for preservation responsibilities. Helmut Bansa, in an article entitled "The Awareness of Conservation: Reasons for Reorientation in Library Training" calls for a "new consciousness of librarianship"; one from which better understanding and judgment with regard to books as physical objects will result. "The basic course should inject into the librarian's mind the realization that books are not just carriers for information but that they are also a structure of complexly organized materials which, like all highly-ordered materials, tend to a state of disorder."9

Unfortunately, few formal programs exist today which address the broader educational needs of curators or conservators facing today's preservation and conservation decisions. Columbia University's School of Library Service implemented the first degree-granting program for library preservation administrators and conservators in 1981. The curriculum includes courses in the history of books and printing, technology and structure of records materials, descriptive bibliography, and chemical problems in library and archives conservation.10 The chief designer of the program, Paul Banks, has long advocated the necessity for a broader education for book conservators.

Another program sponsored by the School of Library Service at Columbia University is the summer Rare Book School. It has offered five-day, noncredit courses "some...directed toward working rare book and special collections librarians and archivists; others...intended to attract persons working in the antiquarian book trade; bookbinders and conservators...."11 Course titles have included: "The History of the Book"; "Medieval and Early Renaissance Bookbinding Structures"; "Italian Humanistic Manuscripts of the Fifteenth Century"; "Evidence of Ownership: Tools and Techniques for Investigating the History of an Early Printed Book"; "Introduction to Descriptive Bibliography"; and "The History of American Book Design."12 Courses on preservation and the theory and characteristics of conservation binding have also been offered.

In a 1982 article on preservation, Margaret Byrnes cites only a handful of opportunities besides the Columbia program:

Other reports of formal training opportunities include a preservation mini-course at the University of Michigan School of Library Science, a seminar on the conservation of library materials offered by the University of Texas Humanities Research Center, Wayne State University's course in the conservation and administration of photographic collections, three summer courses on the same topic offered at
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the Rochester Institute of Technology's School of Photographic Arts and Sciences, and a new conservation certification program at San Francisco State University.

The number of library schools offering introductory courses in preservation has been steadily increasing but these are almost always survey courses covering the gamut of preservation activities from reformatting to commercial binding specifications, from environmental standards to disaster preparedness, from the chemical instability of machine-made paper to exhibition preparation. Rarely is there time or the faculty expertise necessary to concentrate on the philosophical and practical identification of historical, aesthetic, and evidential value of individual items or collections.

Requests for funding have been made by several universities with established conservation facilities to enable them to expand their training capabilities. If funded, these programs will undoubtedly emphasize the importance of understanding to the extent possible the full evidentiary significance of an item or collection before specifying treatment. Again, however, the training will not (nor is it intended to) produce conservators who have all the theoretical knowledge required to come to that understanding alone.

We have then a situation in which more conservation treatment is being specified for a wider range of materials. At the same time, as experience expands the knowledge of both curators and conservators beyond the bounds of their traditional education and training, each is recognizing new challenges and complexities in conservation treatment decisions. Simultaneously, each is becoming aware of the inadequacies of his own and each other’s preparation for treatment specification for many materials.

In addition to the problem of deciding the best means of conserving and preserving these materials, another major issue must be considered: that of public access to the collections. Because they are the staff in direct contact with readers, curators must interpret the institutional attitudes toward access to and the handling of items not in perfect condition. Most libraries are user oriented so that curators can feel a press for optimal access rather than optimal protection. Hence the librarian/curator is placed in the role of broker between the patron and the collection. Therefore, it is important that decisions to deny access be based not only on firm bibliographic knowledge but also on a knowledge of book structure and chemistry, and potential hazards in order to avoid arbitrary decisions. Curators must think of each individual item in the context of the entire collection and develop varying levels of access to
specific items in order to ensure availability for generations to come. Conservators, on the other hand, because of their technical expertise, are usually entrusted with the authority to determine and execute treatment procedures. Because items are frequently sent for treatment one at a time, conservators may be forced to make treatment decisions without either the knowledge of how an item fits in the context of the collection as a whole or its pattern of use. This is often a greater disadvantage for private conservators who are more isolated from curatorial access.

To the credit of both professions, what is resulting from this heightened awareness and growing anxiety is a valuable dialogue—i.e., an attempt to build bridges across professions to encourage an exchange of knowledge and information between curators and conservators. One such bridge has been built by the Rare Books and Manuscripts Section (RBMS) of the Association of College and Research Libraries (ACRL) Division of the American Library Association (ALA). In 1984, an ad hoc Committee on Curatorial Issues Raised by Conservation was appointed. The committee was composed of librarians and conservators and was charged to “try to develop guidelines that would help direct the working relationship of curators and conservators at the treatment level of library materials.”

Discussions of the committee tended to focus on four topics: (1) what curators should be able to expect from conservators; (2) what conservators should be able to expect from curators; (3) what curators and conservators should be able to expect from administrators; and (4) the impact of conservation treatment decisions on the user of library materials. Some of the questions raised during the committee’s discussions indicate the confusion and concerns felt by curators and conservators: many curators think that conservators and curators should share treatment decision-making but that since curators are the custodians of the collections, the final authority for treatment decisions should be theirs. This is common practice in the museum field. But what about the curators who are not knowledgeable enough about the items in their care to make responsible decisions and, therefore, depend upon the judgment of a conservator? How can a curator determine the competence of that conservator? Presently there is no certification process for book and paper conservators and the conservators themselves disagree on a procedure to certify, or even the desirability of certification at all. The conservation field’s professional organization, the American Institute for the Conservation of Historic and Artistic Works (AIC), has suspended the certification of paper conservators established several years ago. On the other hand, it is considering the revision of its code of ethics and standards of practice to better represent the materials and
practices of library conservators. If a curator must, then, rely upon the advice of his/her conservator, how can he/she make a reasonable evaluation of the skill level, knowledge of materials, or ethical and philosophical approach of that conservator? As one member of the committee stated:

At this point in the infancy of book and library conservation as a systematic discipline, one cannot assume any uniformity of training, philosophy, treatment, practice, or skill among those equipped as book conservators. Practicing book conservators at this point in time include fine binders, commercial binders, trade binders, and paper, leather and objects conservators. The philosophy which informs the practice of each of these types is distinct and will most likely result in different approaches to the same problem and different sensitivities to the object under consideration.

Conservators, too, are concerned about the competence of curators. Can a conservator assume that a curator does, in fact, understand the bibliographic significance, historical and monetary value, past and future use patterns, and the contextual importance of the collections well enough to make responsible treatment decisions? What if a conservator is instructed by a curator to perform a treatment with which she or he does not ethically agree?

Both conservators and curators on the committee agreed that discussions between curator and conservator are crucial to ensure that the physical integrity and useful life of their collections are preserved. This cooperation is especially important when a compromise must be found between use and preservation of the integrity of the physical object. It was recommended that conservators and curators "discuss their respective views on aesthetic and historic value and on what constitutes physical integrity and intellectual or scholarly meaning." Even though disagreements may exist, a recognition of differing points of view may lead to a "reasoned compromise" and avoid the chasm so graphically described by Bansa.

After four meetings, the Committee on Curatorial Issues Raised by Conservation decided that it was premature to issue the guidelines it was charged to develop and recommended that it be discharged. It felt that curators "had not had enough experience working with conservators to respond meaningfully to the often sophisticated points raised by the conservation profession about treatment matters." It determined also that it would be more timely to see how the revisions of the AIC Code of Ethics and Standards of Practice will affect the practice of book and paper conservators before guidelines are developed. However, to enable the valuable dialogues initiated by the group to continue and expand,
the committee was reorganized into a discussion group and will continue to be a forum for discussion of curator/conservator relations.

Another bridge between curators and conservators was built by the conservation staff of the Harry Ransom Humanities Research Center (HRHRC) at the University of Texas at Austin. In March 1986, an impressive symposium was held at the HRHRC entitled "Paper: The Conservation of Meaning," which addressed very specifically the "sophisticated points" raised by the conservation treatment of single items and collections. It drew participants from the museum, library, and archive professions, curators and conservators alike, to explore the joint responsibilities of caring for paper collections. It began with the assumption that any alteration of the fabric of an original document alters its meaning and that curators and conservators are jointly obliged to do their best to understand its meaning in order to evaluate responsibly the effects of any proposed treatments.²⁹

The agenda for discussion began with the identification of the elements and qualities of the objects to be conserved. The questions considered were intended to elicit a thoughtfulness about an object which conservators and curators may never have considered. For example, questions were posed to aid in understanding how the physical structure of an object came to be: "How does the object relate to other similar objects? To what traditions of craft or fabrication does it belong? Does the object display innovation? Are materials or techniques used differently than in similar objects?"²⁰

Perhaps the most stimulating questions were introduced under the agenda item "Understanding the Object's Meaning." What is the influence of the creator's culture, including political and social history, iconology, relationship to work in other forms, i.e., that which provided the creator with a language of ideas? What was the creator's relationship to received traditions? Which elements were accepted and employed, which elements were employed and modified, and which elements were invented and introduced into the culture? How was the work understood by the creator (includes his statements about his intentions)? How was the work understood by its original audience? How was the work understood by later audiences? How is the work understood today?²¹

Further discussion centered on determining how the object's physical deterioration interferes with the understanding, appreciation, and significance of the elements and qualities previously identified and what the effects of various treatment methods might be on these qualities. Also addressed was the item's significance beyond the confines of a particular institution. "There may exist tension between an object's function in a given institution, and its value to the culture as an object
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which may outlast several institutions. The physical condition of an object forms a history of its value and uses.\textsuperscript{22}

Documentation of the object was considered. The question was raised as to whether or not the form of documentation chosen (or any form of documentation) could adequately preserve evidence of the elements and qualities identified as significant. To decide on appropriate treatments, the participants considered the establishment of criteria for evaluating the information learned about the meaning of an object and the effect of treatment on that meaning. Ethical questions were asked, such as what level of alteration, damage, or loss resulting from treatment could responsibly be accepted? Can the improvement in an object’s condition as a result of treatment be confidently estimated to outweigh the risk of adverse effects?

Obviously, no curator or conservator or combination of curator/conservator will be able to understand the significance of every item in his/her collection to the extent considered during the HRHRC symposium. However, the depth and breadth of understanding implied by the questions posed during the symposium serve to illustrate the potential complexity of an object’s meaning and serve to emphasize that any proposed treatment should be considered a potential intrusion upon that meaning. “The goal of researching an object’s meaning prior to treatment was seen as making explicit as much information as possible, so that physical intervention would not proceed from ignorance and later be regretted.”\textsuperscript{23} There is no doubt that the interplay of curator and conservator and the pooling of their professional knowledge will be required to ensure decisions based on understanding and not ignorance.

Clearly the crux of these treatment decisions has to do with two potentially conflicting needs of scholarship—the right to gain access to an item in a usable physical state in order to explore its contents and artifactual/historical information, and the concern that any conservation intervention may endanger access to this information in its purest form. Therefore, it is important to understand the best methodology for decision-making. However, this is no small task. The recognition of both professions that it is advantageous, indeed necessary, to work more closely together is significant. The opening of avenues for self-education, mutual education, and joint understanding, and the acceptance of levels of responsibility (both shared and individual) perhaps not recognized before will result not only in a more thoughtful approach to conservation treatment but will also enhance our sensitivity to and depth of understanding of our research collections.
CULLISON & DONALDSON

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References

1. For the purpose of this discussion, the terms preservation and conservation are not used interchangeably. Rather, preservation is used to describe the comprehensive activities which serve to prolong the life of library materials or their intellectual content. These activities include disaster planning, reformatting, preventative maintenance, handling techniques, etc. as well as conservation treatment. Conservation is the component of preservation which is the physical treatment of individual items by a conservator or conservation technician. This distinction is gaining wider acceptance in both the library and conservation/preservation fields, although it is by no means universally accepted.


7. Ibid., p. 34.

8. Ibid.


12. Ibid.


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21. Ibid.

22. Ibid., p. 2.

23. Ibid., p. 3.
The formation of rare book facilities in American university libraries was a fairly recent development when Library Trends published its last issue on "Rare Book Libraries" in 1957. Special areas with controlled access provided improved security and better conditions for preserving materials. Georgia Haugh's Library Trends article reviewed access policies and described users' resistance and hostility to protective measures taken by libraries.\(^1\)

Thirty years ago rare book departments of university libraries and independent rare book libraries used policies and procedures as the primary means of controlling access to and use of their collections. Admissions interviews were customary. Application forms and presentation of credentials and letters of introduction were often required. The number of items a reader could use at once was limited. Rare book collections were shelved in locked stacks, browsing was prohibited, and circulation of materials was forbidden. Readers signed daily registers which were helpful in tracing lost books. "The effectiveness of all these various precautions is demonstrated by the reports of little mutilation and few losses. . . . One can safely conclude that rare book custodians have carried out their major responsibility of care and protection with marked success."\(^2\) Policies and procedures seemed adequate protection against the remote possibility of theft. Ten years previously, Lawrence Thompson had written his famous "Bibliokleptomania" for The New York Public Library Bulletin, but library theft seemed to be neither a burning issue nor a trend. The confidence and security of those days
have disappeared in a period of major change in libraries, universities, and their environment.

Environmental Change

The consolidation of rare books and manuscripts into special collections departments has continued in colleges and universities with many institutions systematically surveying general collections to identify books that have become rare simply with the passage of time. Library friends groups and other donor relations efforts have brought new collections into libraries. Major private collections have found their way into institutions, decreasing the availability of rare books on the market and driving up the price of what is for sale. Over the past thirty years the values of rare books and other artifacts have skyrocketed. Publicity has made this widely known. This increasing value of rare books and their scarcity have been accompanied by major thefts and growing concern over library security.

The teaching of history and literature has changed dramatically over the past thirty years. Assigned readings in textbooks and reserved reading rooms have given way to study and analysis of primary materials, not just among college students but in high schools as well (see Laura Linard's article in this issue). Students at all levels are seeking primary materials and early printed sources in libraries and historical societies. An outburst of interest in genealogy occasioned by the publication of *Roots* and popular enthusiasm engendered by the U.S. Bicentennial have brought numerous new readers to rare book libraries and archival collections.

Increasing numbers of people need and want to use special collections, placing new demands on service and creating new security risks. Their new interests and enthusiasms arose at a time when our society as a whole was becoming less accepting of elite institutions and authoritarian structures. Admissions policies and procedures have generally become more liberal in response to growing service needs.

Parallel with the growth of institutional rare book and archival collections and their increased use, the past thirty years have also witnessed a dramatic increase in property crime of all sorts. A national alarm system firm's radio advertising campaign states that one in four households without alarm systems is burglarized each year. Electronic protection of retail establishments is the norm. Thieves have victimized rare book libraries both randomly and systematically including Harvard, Yale, the New York Public Library, Stanford, the Newberry Library, and the John Crerar Library. James Shinn, convicted and
imprisoned for thefts from the Oberlin College Library, identified and searched out rare books in libraries that had not sequestered their rare books. At the same time, large libraries with long-standing practices and procedures for segregating and protecting their rarities were victims in major cases of theft.

**Major Cases of Rare Book Theft**

In 1966 thieves broke windows on doors and moved an exhibit case at the University of Illinois Library to steal three rare books then valued at $75,000. Robert B. Downs, the dean of library administration, thought that the books would be difficult to sell unless the thieves were professional and had stolen the books on commission from a buyer. The same year, manuscripts were stolen from the Vatican Library by thieves who scaled walls, crossed gardens, and climbed a drain pipe to break in. The manuscripts were found abandoned in a nearby field. The fact that the thieves did not steal other manuscripts of higher value led officials to speculate that this theft was also commissioned by a collector wanting specific manuscripts.

*Topkapi*, a movie thriller about thieves trying to steal a priceless emerald from the center of a harem in Istanbul, seems to have been the model for a thief who tried to steal Harvard University’s Gutenberg Bible in 1969. Fortunately for Harvard, the thief did not take the weight of the volumes into account when he planned to swing himself out of a window on a rope and instead of escaping he fell to the ground wounded and knocked unconscious. The tale of this theft was recently recounted by W.H. Bond in *Harvard Magazine*. Harvard immediately reviewed its security precautions. Robert R. Walsh, an architect-librarian who worked for Harvard in planning for new systems, has reported that in his investigations he contacted major libraries and museums; without any inquiries to verify his identity or authority, officials freely described their systems with details about what they had, what was alarmed, and what was not.

Harvard’s Zoology Library lost rare books and valuable plates in 1979 including works of Audubon, Captain James Cook, Lewis and Clark, and Charles Darwin. Lists of lost books were published in the *Antiquarian Bookseller*. A San Francisco bookseller alerted the University of California to eighteenth- and nineteenth-century books that were stolen from them. Police recovered 260 stolen books from the suspect’s residence, and he was identified in a lineup by several antiquarian booksellers.
In 1978 Yale University recognized its own maps in a group of maps presented for sale by a dealer. Also presented were maps belonging to the Newberry Library. Working in cooperation with the FBI, the libraries established that Andrew Antippas had stolen the maps; he was convicted and imprisoned. The maps stolen from the Newberry had been travelers’ folding maps which Antippas pocketed during a visit to the library during a Modern Language Association convention. The theft reinforced the importance of security as a major objective in construction, renovation, and program planning for the Newberry Library.

Stanford University recovered $100,000 worth of rare books in 1976, and James Wilson Mull, a former graduate student, was sentenced to prison for grand theft. In sentencing Mull, Judge John S. McInerny said: “If you’d taken the books and just kept them at your home to get whatever enjoyment out of them, I’d have a different view, but you treated them as a commodity.”

An out of court settlement secured the return of over 400 rare books and manuscripts stolen from the John Crerar Library in Chicago in 1985. Joseph Putna was sentenced to two years in prison for theft of materials that included works by Copernicus, Galileo, William Harvey, and Leonardo da Vinci.

Summary as these accounts are, they are symptomatic of a far more complex and difficult rare book security situation than what was known in 1957. Libraries that once seemed secure have been victimized from without as well as from within.

Thieves and Their Methods

Books are stolen by a variety of people with different motives. John H. Jenkins, security chairman of the Antiquarian Booksellers Association of America, has categorized book thieves as: (1) the kleptomaniac, suffering from a compulsion to steal books, (2) the thief who steals books for his own use or possession, (3) the thief who steals in anger and is likely to destroy materials, (4) the casual thief who steals when an opportunity presents itself, and (5) the thief who steals for profit. Over the past thirty years there has been increasing activity in the last category. Among the thieves have been scholars, librarians, writers, and professional thieves. There have been outside and inside jobs. “Bona fide researchers, students, and faculty members with impeccable credentials have been thieves. Con artists posing as scholars, book dealers, librarians, archivists, and even clergymen have been caught stealing. . . . There is strong evidence that many other major thefts have involved insiders.” Whether thieves have been actual insiders or not, the major
cases reported in the last thirty years have involved thieves who developed an inside understanding of both libraries and the antiquarian book trade.

Andrew Antippas, a popular English professor at Tulane University, had extensive experience as a scholar in libraries. He developed an interest in early maps and came to know them through visiting dealers in New Orleans. At first he began to steal maps from libraries he visited during professional meetings and he kept them for his personal collection. It was only when he began selling them that ownership of several maps was traced to Yale and to the Newberry Library. At the Newberry he wandered away from a reception into a "staff only" area where he found pocket maps made to order for passing through the library's checkpoint as he left. Concealment and his own scholarly credentials were key to his operation.

Joseph Putna, a long-term user of the John Crerar Library in Chicago, befriended an elderly and lonely staff member who allowed him to work unattended in the rare book vault. Putna was using the Crerar to do medical research, initially as the employee of an advertising agency and later as a free-lance writer. He looked for illustrations of early medical procedures and had copies made for reproduction. Dissatisfied with Crerar's copy quality he first illegally borrowed books so that he could have better copies made; he actually returned the first batch of books to the shelves—with some trepidation. Then, getting used to the idea and the ease of stealing, he set about systematically stealing rare books and found a dealer to sell them to on a regular basis. Putna's *modus operandi* was to leave his briefcase and coat in the library's public reading area, go to work in the vault by passing through a secure staff area; left alone in the vault he would hide books on his person, then take them to his briefcase, put them in envelopes, seal them, place them with other envelopes and papers in his briefcase, present the briefcase to the guard for inspection, and pass out of the library. When questioned by Warren Howell, the San Francisco book dealer to whom he sold books, Putna said the books were inherited from his father-in-law who was killed by Nazis in East Germany after World War II. Joseph Putna used concealment, ingratiation with employees, and misrepresentation to steal nearly 500 books and to sell over half of them to one of the country's most prominent book dealers.

James Wilson Mull, a graduate student, stole nearly 200 books from Stanford University's rare book collection in the early 1970s. Mull took advantage of his identity as a student and the vulnerability of an unsupervised access point. He cut a link from a chain securing an unsupervised gate and fastened it with his own padlock and then was
able to come and go over a period of time, concealing books in his knapsack. Later he tried to sell books in Europe and in San Francisco where a bookseller recognized some titles as ones he had sold to Stanford.

George B. Davis, librarian at the Virginia Military Institute, was fifty-one when he was arrested for stealing books valued at $100,000 from the library. He and his wife had set about establishing a rare book store, Copper Fox Farm Old and Rare Books, in Millbrook, New York. Davis had previously been librarian at Bennett College. This is a case where the guardian became a predator, violating his professional trust.

Although high on the scale of those considered to be trustworthy citizens, even ministers have been book thieves. In 1977 residents of Big Sandy, Texas were shocked when Rev. Craig Dwaine Lacy was arrested after trying to sell rare materials stolen from the Jefferson Historical Society and Museum. At the time of his arrest he had a detailed list of 108 museums, university libraries, public libraries, and antique shops he had stolen from including Southern Methodist University and the Sam Rayburn Library. John Jenkins, a bookseller mentioned earlier, traveled across the state to help identify ownership.

The cases summarized here are only a few of those reported over the past thirty years. They illustrate how the thief may be someone who is least suspected. In fact each of these took particular advantage of his seeming trustworthiness and of his position in the community. Each also took advantage of vulnerabilities in the institutions they stole from. Wider experience with book theft in general and with rare book theft in particular has led to libraries and archives as well as their professional organizations examining and attempting to deal with such vulnerabilities and risks.

Library Theft Prevention—Organized Responses

Theft of rare books is part of a larger pattern of loss in libraries. Actual theft (or greater awareness of its extent) has produced responses from institutions, professional groups, and the security industry. Systems have been developed and diagnostic and prescriptive articles have appeared. A number of associations have taken organized approaches to preventing theft and recovering material that has been stolen; broadly based prevention programs have been proposed and some have been implemented.

Electronic security systems first appeared around 1965 with both Checkpoint and Sentronic well established by 1970 when “Library
protection systems" first appeared as a heading in *Library Literature*. These systems generally involve insertion of targets in books or in the spines of books and have therefore not been used for protecting rare books and cannot be used for leaves of manuscripts. Although there has been much discussion of electronic checkpoint security systems both pro and con, they have not been seriously considered for special collections. Other electronic devices such as motion detectors, intrusion alarm systems, and closed circuit television cameras have been employed increasingly for after hours security.

The library profession's growing concern with security is dramatized in the growth of literature on the subject. In its 1955-57 cumulation, *Library Literature* cited three articles on library theft; in 1967-69 there were thirty-six; in 1974-75 there were forty-four. Among the indexed articles there are frequent notices of thefts in *AB Bookman's Weekly* but the incidence of titles specifically concerned with rare book theft and security is small. *Library and Archival Security* began as a newsletter and is now a quarterly journal, publishing articles, news items, and bibliographies covering library security and preservation issues. An exhaustive review of rare book and manuscript security literature, cases, and issues by Slade Richard Gandert—a book collector, librarian, and security consultant—appeared as two numbers of the journal in 1982.

Although the specific literature for rare book security is thin, groups of professionals have gathered together to grapple with these problems, to prevent theft, and to ensure recovery of stolen property. With support from the National Endowment for the Humanities, the Society of American Archivists carried out an archival security program in the mid 1970s. Timothy Walch led the effort that produced a series of basic manuals for institutional security programs and established a registry of missing manuscripts. Publications and consultant services of this program were aimed at heightening awareness and establishing local security programs.

Within the Rare Books and Manuscripts Section (RBMS) of the Association of College and Research Libraries, a Security Committee was formed in 1979 under Terry Belanger's leadership. The group has worked on developing and refining guidelines and establishing liaisons with archivists, the antiquarian book trade, and with book collectors. In 1982 the RBMS approved "Guidelines for the Security of Rare Book, Manuscript, and Other Special Collections." More recently they have been working on guidelines for what to do before theft occurs and checklists on what to do after theft occurs as well as drafts of model legislation on theft and mutilation of library materials.
Although booksellers have often been victimized as a consequence of library theft and have expressed impatience with some libraries for their reluctance to publicize losses, in 1981 the Antiquarian Booksellers Association of America, working with libraries and private collectors, established a computer system to register missing books and manuscripts: BAM-BAM (Bookline Alert: Missing Books and Manuscripts). Libraries and collections can list their missing materials and dealers and libraries can search the file when materials are offered for sale. John Jenkins's booklet cited earlier outlines details for BAM-BAM which is operated in cooperation with American Book Prices Current. Speaking at the Oberlin conference in 1983 on library theft, Katharine Leab said that few libraries were using the service: "The dealers are checking a lot, but the libraries are not reporting their stolen books."

Oberlin College, the scene of James Shinn's capture, was host to the First North American Conference on Library Theft. Over sixty participants and observers attended the conference including directors and curators from research libraries, antiquarian book dealers, and law enforcement officials. Participants presented papers reflecting on causes of increasing rare book theft and discussing responsibility for prevention and steps for recovery of lost property. Lawrence W. Towner, in his keynote address, deplored the destruction of "the republic of letters" and the damage to the trust characteristic of American cultural institutions. Terry Belanger discussed thieves and said that they are more likely to be students, professors, librarians, staff members, or custodians rather than professional criminals. Recommendations proposed during the conference included restricting access, closing stacks, requiring positive identification of patrons, immediately publicizing thefts, prosecuting apprehended offenders, and improving relationships with law enforcement agencies. Conferees also discussed the idea of establishing a national register of library ownership marks and strongly advocated indelible marking of library materials.

Security Programs and Policies

Many articles and books in the growing literature on library security provide frameworks for planning security programs, for entire systems as well as for special collections. Timothy Walch's manual prepared for the Society of American Archivists Archival Security Program is an important planning tool in developing a security program for special collections. The manual lays out four planning checklists, one each for staff, patrons, collections, and the building.
Such checklists are, in fact, common in the literature on library security and by reviewing them a library can develop its own checklist or security audit form for planning a security program and for reviewing progress.\textsuperscript{22}

Mary J. Cronin developed a workshop package to help libraries in the Milwaukee area plan for security; this method could be used to identify local security needs and then could be followed up by developing policies and procedures.\textsuperscript{23} The Security Committee of the RBMS of the Association of College and Research Libraries published guidelines for security in 1982 and continues to develop guidelines in this field.\textsuperscript{24}

The importance of appointing a security officer is emphasized throughout the literature. Controlling access to collections and building areas—for both patrons and staff—is a key element along with physically segregating valuable and unique materials. Adequate records of ownership must be kept and photocopying is recommended for the most valuable items; inventories are recommended, though costs have often become prohibitive. The RBMS guidelines lay down standards for marking rare materials. Procedures to follow when theft is suspected or detected need to be worked out and relations with local law enforcement officials should be maintained so that recovery and prosecution can proceed effectively.

**Trends in Special Collections Security**

This review of security since 1957 has shown that theft has become a much more acute problem. The problem has been the focus of conferences, articles, and books. Preventive measures have been suggested and over time some of them have been implemented. The idea of national registers of missing books was suggested and now there are several media for published lists as well as computer databases for both listing lost books and checking to see that titles offered for sale are not stolen property. Marking rare books and manuscripts, not a common practice in American libraries thirty years ago, has been officially accepted by the American Library Association. Disclosure and publicity about thefts have become more acceptable to librarians it seems, and crisis public relations was one of the topics of the Oberlin conference. Current concern and activity are focused on legislation governing library theft, working closely with local rare book dealers, and reviewing general collections in order to transfer rarities to secured areas.

The Association of Research Libraries (ARL) Office of Management Studies Systems and Procedures Exchange Center has published
kits on theft detection and prevention (1977), special collections (1979), and on security (1984), which give a picture of trends at the institutional level. Electronic systems have been usually applied to general collections in ARL libraries with the protection of rare materials depending on restricted access.

Special collections goal statements as well as policies and procedures are among documents in the ARL special collections kit. Protection and security for rare materials is a function of special collections departments, and procedures for protection against theft are laid out in the assembled policy and procedure statements. Precautions include daily registration of readers; special applications for manuscript use; limitation of items that can be used at one time; and prohibiting outer garments, briefcases, parcels, books, and umbrellas in reading rooms (and searching containers such as handbags and shoulderbags on departure). A renovation program document for a university special collections department calls for isolating special collections from the rest of the building, a separate key system, only one entrance and exit for patrons, and an electronic theft detection system (presumably intrusion alarms and motion detectors); maximum access control is emphasized.25

A RBMS questionnaire on security was used as the model for the survey reported in the most recent SPEC Kit on collections security. The eighty-nine responding libraries (76 percent of the ARL membership) reported as follows: 31.5 percent were marking special collections materials, 71.9 percent thought they could quickly answer an inquiry to determine whether an item had been stolen from them, and 14.6 percent had security policies. The policies collected cover a range of security and emergency concerns with more emphasis on dealing with theft after the fact than prevention through policies and procedures. The compiler of the kit found that most libraries did not address of these issues: stack access, surveying collections for material to be moved to a restricted access area, systematic inventories, staff training in observation techniques, procedures for dealing with suspected theft, comprehensive marking of materials, tracking loss rates, and designation of security officers to coordinate security activity.26

Collection security is being addressed widely in conferences, national committees, and institutional committees; policies and procedures are being developed. Librarians and booksellers whose institutions and firms have been victimized are sharing the hard learned lessons. However, increased theft and a seeming slowness to address security issues paint a less than optimistic picture.
Problems

Vulnerability to theft is a modern condition for libraries. It is a problem with many facets—access competes with protection; staff are suspect and security mindedness is difficult to foster; service demands undermine surveillance efforts; bibliographic control of rare materials, from identification to marking, is impeded through institutional inertia and enormous processing backlogs; libraries and librarians become so overextended that they lose consciousness. Controlled or restricted access to special materials is the principal means of preventing theft and mutilation. However, once access is restricted, demands of various kinds create new problems. Class assignments or other activities may bring in more readers than the facility can seat or than the staff can properly supervise. Curators conscientiously trying to maintain security may be faced with criticism from faculty and administration for being too restrictive, and they may have little time or space for arriving at acceptable compromise solutions. Restricted access seems to invite exceptions and pleas for special privileges; if responsibility and authority are not clearly delegated to staff immediately responsible for access control and if privileges are granted by library directors or university administrators distant from the situation, control is lost. By the same token, if standards for access are not closely monitored, procedures may slip, especially when long-term users become “insiders” after years of familiarity.

Staff, who are insiders, have been held accountable for all but 25 percent of major library thefts. Careful screening including background checks is recommended in selecting special collections staff. Timothy Walch recommends discussing applicants’ interest in rare books and collecting, remaining alert to the fact that staff members may be tempted to steal for their own collections or for profit. He also recommends bonding employees under a theft insurance plan. These precautions deal with the new employee, but there seems to be nothing in the library literature on theft that deals with the employee of fifteen or twenty years who may change over time and steal out of anger, greed, or mental imbalance. In his talk at Oberlin, Lawrence W. Towner reported how a longtime employee removed uncataloged books from the Newberry Library in shopping bags as she was gradually coming apart emotionally. Testimony in the trial to recover books stolen from the John Crerar Library recounts how an elderly employee with the keys to the vault was befriended over several years and how he, in violation of policies and rules, granted access to the rare book vault, even continuing
to do so after being reprimanded by the library’s director. These employees were no doubt trusted and trustworthy when they were hired.

Staffing for security is a problem for libraries. The friendship or simple familiarity that door checkers have with many patrons may make them reluctant to check the patrons’ bags and cases. If they are students, they may also be intimidated by faculty and staff to whom they feel subordinate. Also, the very dullness of the job can make checkers ineffective. Professionals with law enforcement backgrounds may be sought for security work, but libraries find that they do not often have sensitivity to institutional service values. The Newberry Library even had a compromising experience with an impeccably credentialed security consultant who managed to leave proposed security equipment layouts of the library at a public bus stop.

Funds for staff positions are limited and this seems particularly acute in bibliographic control. To be protected and easy to recover, materials need to be cataloged and marked. Large collections need to be surveyed to ensure that rarities are gathered together where access can be controlled. Libraries have scattered rare books in general collections; they have also accepted gifts that then remain uncataloged and unmarked for generations.

Collections have grown so large that few libraries do systematic inventories. Before accepting responsibility for the rare book collection of the John Crerar Library when it merged with the University of Chicago, Robert Rosenthal insisted on enough funding to thoroughly inventory the 27,000 volume collection. During the eighteen-month search, a pattern of missing books emerged and just as analysis began, a European scholar established that a fourteenth-century manuscript in the Berlin State Library was in fact a Crerar manuscript. The inventory, at a cost of nearly $100,000, was crucial in breaking open the case against Joseph Putna.

Although marking has been endorsed in the profession, it is not being done systematically nor, as indicated in the ARL survey, does it seem to have been fully accepted at the institutional level. Retrospective marking, like cataloging backlogs and complete inventories, seems to be an overwhelming task. James B. Rhoads, who in 1966 advocated marking archives, estimated that the manpower expenditure needed to mark the holdings of the National Archives would be 5000 years but suggested that long-range, well-conceived, selective marking programs be undertaken. Even though traditional resistance and the difficulty of the task militate against marking, proof of ownership is extremely important to recovering materials after theft; visible and indelible mark-
ing of the most valuable items in collections is a deterrent to theft. Librarians need to make this a priority in their security programs.

The problems of security programs point to a larger issue in the library profession. With inadequate support, libraries can grow beyond the grasp of their guardians. As higher education has retrenched, libraries have competed for funds with faculty and research staff. Funds for collections supporting institutional programs, for processing collections, and for service to readers have been cut back. Programs to gather special collections and mark them are stalled. When systems on all levels become overloaded, directors hope that theft—like fire and flood—will not happen here. By a kind of protective aversion they turn their eyes away from certain problems, particularly the ones that are not visible and obvious like theft. Librarians, curators, guards, and staff at all levels lose sensitivity, not seeing problems, or perhaps even wishing them away. Because of slow institutional and cultural change, staff may not even realize that significant items in their collections have appreciated in value.

Loss of awareness as it affects rare book security may take place at many levels. A bored door checker may not observe suspicious characters lurking around the corridors and may become perfunctory in performing briefcase searches. Reading rooms may become so busy that manuscript files are not counted before returning them to their boxes. Administrative staff burdened by fund-raising and public programming activities may not get around to reviewing procedures and checking to make sure that new staff are trained in observation techniques. What is referred to here as loss of consciousness might also be described as psychological denial, suspension of disbelief, protective aversion, passing the buck, or burnout.

Averting the eyes, even loss of awareness, seems to be a thread throughout the John Crerar Library case. Each principal in the case seems to have had a suspicion threshold which was exceeded. Years of friendly attention made the elderly staff member trust Joseph Putna and other staff also accepted Putna. William Budington, the library director, reprimanded the staff member and, because he had known him for years, trusted that that was the end of the matter. Warren Howell, the San Francisco dealer, asked where the books came from and was told they were inherited from a father-in-law in East Germany; the Iron Curtain became like a blind that was pulled down on further inquiry or consciousness. Kenneth Nebenzahl, a Chicago dealer, who was involved in early transfers of cash with Putna, questioned the procedure and early on refused to continue, but since cash transactions are not unknown in
the business, he did not press to know more at that time. Even in Putna’s own testimony, one can sense a shift in consciousness; the reader senses the transition from illegal “borrowing” to outright stealing.

As an institution, the John Crerar Library began to lose consciousness of its rare book collection when it moved to the Illinois Institute of Technology in 1962. Its mission shifted from the comprehensive acquisition of science materials, including rarities, to timely provision of current technical and scientific information. No one on the staff was a specialist in the history of science and thus no one was seeing catalogs offering Crerar books for sale or even ads placed by Warren Howell asking libraries to examine their copies of specific titles. It is as if the books were placed in a locked room and lost from institutional consciousness; in a sense Joseph Putna did “inherit” them from behind an iron curtain.

A similar lack of awareness made forty or so libraries easy targets for James Shinn, made the Newberry Library a target for Andrew Antippas, and laid Stanford open to the depredations of a graduate student. It may be that examining our goals in relation to our resources to ensure that we are not overextended and finding new ways to remain conscious constitute the only means we have for fulfilling our responsibility as stewards of culture.

**Security Consciousness and Regular Security Audits**

Libraries need to assign staff members to take charge of security; they need to develop programs, policies, and procedures; they need to train staff at all levels and to ensure security consciousness. A first step in planning should be making a security audit with a checklist compiled with broad staff involvement. This will identify weaknesses and vulnerabilities for which corrective action must be taken. Then programs and policies can be written and implemented, but once they are in place there is a danger that a library may have a false sense of security.

Each library needs to do a full security audit once a year and should examine other phases of its security program on a more frequent basis, some quarterly, some monthly, and some daily as with opening inspections and closing procedures. When security is a matter of staff consciousness, it should be considered in doing annual personnel service reviews. Is this staff person still honest? Is there evidence of withdrawal, anger, emotional instability? are questions that supervisors need to consider.
Special Collections Security

Last of all, each person responsible for collections, from shelvers to the director, needs to examine himself or herself each day to maintain alertness and awareness of security responsibility. A responsible officer in a research library who had been involved in recovery of stolen materials and planning state-of-the-art systems recently reported handing over an electronic access card to stack areas in the bustle and excitement of a fund-raising dinner so that donors could be given a tour. Guards at a national repository chattered on about alarm system configurations to someone who said he was in charge of security at another major library. Lack of awareness, looking away from problems, simple thoughtlessness, and loss of consciousness are the greatest hazards to rare book security.

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MARY WYLY

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Procedures for Proposing & Guest Editing
an Issue of Library Trends

Scope

Library Trends focuses on library and information science topics of interest primarily to practicing librarians and information scientists and secondarily to educators and students. The style and tone of this quarterly are formal rather than journalistic or popular. Library Trends issues review the literature, summarize current practice and thinking, and evaluate the directions practice is taking. Papers must represent original work, published for the first time in Library Trends. Extensive updates of previously published studies are acceptable, but revisions or adaptations of published work are not sought.

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An issue editor proposes the theme and scope of a new issue, draws up a list of prospective authors and articles, and provides short annotations of the articles' scope or else gives a statement of the philosophy guiding the issue's development. The issue prospectus is examined by the Graduate School of Library and Information Science (GSLIS) Publications Committee and requests for clarification or modification may be made before the prospectus is approved.

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