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Preservation and Conservation Decisions in the Local Library

In the course of the second semester last year, I received a note from the University Librarian, Hugh Atkinson, with which was enclosed a note from a faculty member in the Department of Sociology. This faculty person had located in the library's stacks an old and worn volume which he found to be very important and informative. In his note, he asked whether the library was interested in faculty opinion as to what might be worthy of preservation, and he indicated his interest in our doing something to prevent the loss of this valuable volume. Mr. Atkinson asked me to look into the particular matters involved and to report both to him and to the faculty person.

In checking with the staff of the Bookstacks, I learned that, as a result of the interest of the writer of the letter, the book had been routed to storage which meant that it would be filmed or photocopied if and when it was requested again. As a result of this special interest, the volume was pulled from its place enroute to storage and given immediate attention as to its needs for preservation.

The volume turned out to be a pamphlet published in 1913 which had been inserted into a grey photomount pamphlet binder apparently soon after its arrival in the library. The pamphlet itself was brittle, but not broken or badly discolored. It lacked a title page (possibly it never had one). There were no illustrations. The original cover which had been pasted to the front of the pamphlet binder had become brittle and broken along with the binder, but had lost none of its printed information. Our conservation and photographic services units determined that the best procedure in this instance was to photocopy the entire pamphlet, bind the copy in a new pamphlet binder with acid-free end papers and discard the original. This

was done, including the making of a copy of the original cover to serve as a substitute title page in the new binder.

When the new copy was ready to be returned to the Bookstacks for shelving, I wrote two notes (one to the faculty member and one to the University Librarian) reporting on the entire process and indicating that there was in operation in the stacks a program by which staff listen to faculty and other users and route materials so as to assure special handling and eventual preservation.

I've recounted this experience because it illustrates the involvement of people at several points in a large library staff engaged in ongoing preservation efforts. Those involved were a library user, a library administrator, those responsible for servicing the volume involved, the conservation staff, and the photographic services staff. Each individual or group played a particular role in working out treatment for the volume. The only thing which marks this incident as special is the direct personal involvement of the library's chief administrator. In my experience, all of these same groups and individuals are essential in preservation activity if preservation and conservation of the collections is to become a reality.

For a period of years, I have been aware that the decisions regarding preservation which I have made, which I have shared in making, or which have been made by others have not all been of the same nature. The level or levels within the library's staff hierarchy of the persons involved make some decisions differ from other decisions; however, these levels of involvement are not the heart of the problem. The thing lacking was a clear way to designate other distinctions which seemed necessary in attempting to analyze such problems and decisions. I found little help in my reading or sharing experiences with others in attempting to work in this area. In reading the proceedings of the 1976 conference on *A National Preservation Program* at the Library of Congress, I was therefore quite interested to discover that Daniel Boorstin in opening the conference suggested a division of the questions comprising the problem of preservation. He characterized two rather distinct types of problems as epistemological and technical.¹ He further described the epistemological questions as being social questions, meaning that they are questions relating to the interests of those who will use, administer, and service the materials comprising the collections. I must admit that the term *epistemological* sent me to the dictionary because it has been some time since I had studied formal philosophical language. At this point, it becomes necessary to understand Boorstin's exact meaning and intention in interjecting this term into the vocabulary of library preservation. Epistemology is defined as "the study of the methods and grounds of knowledge especially with reference to its limits and validity; broadly: the theory of knowledge."²

After some reflection on this definition, I have concluded that this is probably a happy choice of terms, given Boorstin's qualification that by the term *epistemological* he means that these questions in their broad sense are social questions as well as questions of knowledge because they pertain to the society for which recorded knowledge is preserved as well as to the knowledge itself.

Under the heading "epistemological questions" we can collect those concerns which have to do with the need to preserve materials in the collections of libraries and archives. These are the questions of what we should attempt to preserve in a general sense as well as the questions which inevitably arise relating to budgeting, staffing and equipping our institutions to do the work of preservation. In general these epistemological questions involve more than the conservator, the preservation librarian, and others on a library staff with responsibility for the care and keeping of the collections. All of these persons are included, but these questions also call for participation by those who use the materials—the sociologist in my introductory remarks and others like him engaged in research, teaching and other activities requiring the use of libraries and archives. Often these persons have very deep and specific knowledge of the materials of a particular specialized subject area. Further, these problems, by their very nature, involve library administrators, budget officers, and those involved in raising funds for the institution among whom may be board members, friends' groups, and possibly even individual donors.

Boorstin's other major heading, "technical questions," which he further defined as physical questions, permits the gathering of those questions and concerns which have to do with the physical nature of library and archival materials and the activities and processes which can be used to enhance their continued usefulness.³ These are the questions and decisions of preservation-minded librarians and other library staff as well as of conservators and preservation specialists as they consider the physical condition and requirements both of particular materials and of whole collections.

Despite the tone of the above sentences, these concerns are not mutually exclusive. All, or nearly all, of the groups and individuals referred to in the foregoing remarks are concerned with preservation in general, with the determination of preservation policy, with the establishment of budgets, deployment of staff and the other ways and means involved in planning and doing the work of preservation. Epistemological questions, as they are answered, inform those doing the work; and, in the other direction, information about processes and procedures, new developments, new needs, and gaps in the ability of an institution to deal with these problems inform those whose role is primarily administrative in nature. Actually, trying to distinguish between the two with great precision is very difficult because

neither the people concerned nor the functions separate with any great neatness. The distinctions made are for purposes of discussion and description and should not be carried over too rigidly into a working situation.

In the paragraphs which follow, several questions or problem areas which fall under one or the other of these two broad headings are discussed. Though the discussion centers first on epistemological questions and then upon technical concerns, their interrelated and overlapping natures are quite apparent; however, the usefulness of these terms in enabling one to distinguish between differing preservation problems is apparent.

Epistemological Questions or Decisions

Perhaps the first and most basic of these is the matter of whether or not to take any particular notice of preservation or to institute any kind of preservation or conservation program within an institution. In its shortest and most concise form this question might be phrased, "Should a library preserve materials?"

There are libraries which at first glance might seem to have little or no need to become involved with preservation because their mission is to provide current materials or current information. Such libraries have no archival function and no intention to be libraries of record. However, even such libraries have the need to preserve their current materials for current use which may stretch over many years; and these institutions will ultimately find it the better part of wisdom to listen to and heed the gospel of preservation, particularly those parts which counsel safe physical handling and storage in clean, air-conditioned, pollution-free, light-controlled quarters. Further, libraries emphasizing current information will have need in many instances for active binding programs to make it possible to keep their materials organized as well as to make them available whole and complete. Almost without exception, they will also have the need to repair and rebind at least occasional items which come to some kind of grief at the hand of even the most careful and well-meaning individuals (both patron and staff). Thus, even though there may be no commitment to keep materials after their current information use is past, there is need for preservation and conservation activity in libraries which might seem unlikely places for it.

The second question, logically, is "What materials will be preserved?" This question is stated in this form because it is still not safe to assume that all libraries will or can conform to the canons of the gospel of preservation relating to provision of air-conditioned, pollution-free, light-controlled quarters. As yet, we have not been able in many libraries to acquire this level of protection for all our collections. The library which has done so is to be counted among the fortunate, and the rest must count themselves

among those still striving to meet these basic criteria. It is part of the routine of survivorship among those lacking this level of protection to work for the coming of a better day, however that may be possible. This may include the documentation of present inadequacies, helping set up a departmental library in new quarters with the necessary equipment and controls to provide a safe environment, and working with all who are interested in improving these conditions. Meanwhile, with or without all the collections of a library in ideal environments, all libraries and institutions with archival missions are faced with caring for collections or portions of collections exhibiting physical problems stemming from age and use. Hence, it appears that the question "What materials will be preserved?" is still valid. While it may be that existing quarters are inadequate, there may be parts of collections which can be dealt with in a positive fashion including the institution of improved housekeeping and teaching the staff to handle materials as they work with them in ways which will minimize wear and tear. Materials of great intrinsic value, unique items, and materials of particular research interest all may provide grist for the preservation mill. Working with such limited groups of materials both fills important needs and gives an institution the opportunity to get started with preservation activities.

How, at the present time, a library determines what to preserve beyond these fairly obvious types of things is a question for which there is no one clear answer. Such an answer awaits at least two developments. One is the availability of mass deacidification; the other is the development of priorities both within individual institutions and among groups of libraries, as to what will receive such treatment. Present indications seem to imply that deacidification service may not be too much more delayed, so planning for its use should begin now. There are some relatively obvious groups of materials in almost all institutions which may be good candidates for initial consideration. Included are those select collections often termed "reference collections" and sometimes called "core subject collections" which are frequently kept close at hand for heavy use by those providing reference service and/or working closely with researchers and students in particular subject fields. To be able to treat such collections so as to assure their continued usefulness and availability would be a major achievement. The gradual emergence of networks presenting the profession with working groups of libraries already formed and already quite dependent upon each other could easily expand their sharing into preservation and conservation by beginning to formulate plans for coordinated programs on a regional or other logical basis designed to assure geographic distribution of materials while sharing the work of preservation. Within regions, libraries could have primary preservation missions dependent upon their strengths, thereby relieving the libraries involved from the need to attempt

to preserve all their holdings equally. Such an endeavor will require the efforts of library users, librarians with many specialties, and library conservators with knowledge both of collections and of the emerging techniques. Also required will be an evaluation of collections of a type we have not had in the past, but one which can utilize past experience in judging the quality of library resources. Such a program will also require ingenuity in other areas and a great deal of determination to succeed before any materials are actually deacidified and back on the shelves.

At some risk of seeming to have answered before having asked it, I submit that the third question in this group of concerns under the heading epistemological questions is: "How will these materials be preserved?" I make this disclaimer because my remarks about deacidification and preservation planning may seem to have already provided an answer. However, I doubt that it will be so simple and direct if and when we get to the time that libraries generally have access to deacidification on a collection-wide basis. The reason is that deacidification will not be a whole cure, but will be a great help in arresting the progress of embrittlement for those things which are not yet brittle or which are not yet too brittle to be used. However, deacidification will not restore strength to paper already too deteriorated for use. Thus the question of methods of preservation remains.

In considering how materials will be preserved we have our past experiences as well as whatever indications of the future we can discern to guide us. Past experience indicates that brittleness can be dealt with in several ways which are familiar but which possibly may be reiterated without too much fear of belaboring the obvious:

1. Preservation-minded staff all across the library to handle materials in ways appropriate to their condition and to extending their usefulness;
2. Quarters adequate for providing safe physical handling and safe storage environments for materials whatever their format, size or medium;
3. Staff specializing in preservation to provide information and training for nonspecialist staff, to provide service for materials needing repair and restoration, and to provide quality control of all preservation activities;
4. An in-house facility for preservation staff to work effectively and efficiently;
5. A binding program, ordinarily based on commercial library bindery services, to provide basic protection and organization for individual volumes;
6. Services of skilled commercial hand binders/paper conservators to perform necessary work on materials of special worth and to amplify the effectiveness of the in-house conservation staff.

While these six points provide at least a description of what can be done now to permit an institution to deal with its collections and their physical deterioration thoughtfully and appropriately, they are offered neither as a preservation program nor as a cure for brittleness. These are simply techniques that libraries have utilized and are utilizing to deal with materials as they age and become increasingly subject to embrittlement. Taken as a whole, these techniques require a continued sizable allocation of resources for the personnel, space, equipment and supplies required to make possible the attempt to handle collections without creating new preservation problems or exacerbating problems which already may exist. Such techniques will remain primary elements in efforts to get the most use out of library materials.

All six of these elements name staff or assume personnel as a primary active agent. Personnel is expensive and will remain so. Almost every aspect of preservation is labor-intensive. The continued dependence upon sheet-by-sheet techniques of paper preservation makes this basic activity so expensive that it is common practice to put it off as long as possible. Furthermore, library conservators are in such small supply that each would possibly be responsible for a group of libraries if we had a truly comprehensive program of preservation. A stated objective of computerization has been to permit the shifting of personnel from purely recordkeeping activities to activity needing human interaction and skill. While it may be hoped that some staff in libraries may be transferred to preservation work as computerization proceeds, the continued pressures of inadequate funding and inflation are such that this may be achieved, if ever, only with great difficulty.

Equipment for preservation work can range from the relatively simple and not especially costly to the rather elaborate and relatively more expensive depending upon the level of operation reached in a given library. While beginnings can be made with relatively simple equipment, a facility capable of a full range of activities and of efficient operation requires a major commitment of resources; and, if a photographic facility capable of providing quality products is included, the amount needed is still greater.

One of the marks of preservation work is that it retains old techniques which continue to meet its evolving criteria, together with the equipment needed to utilize them, as it adopts scientific ways and adapts both the equipment and the techniques of modern science to its purposes. Thus, leaves of a seventeenth-century volume may be hand cleaned using a traditional technique; deacidified in a plexiglass tank designed in the 1970s using a deacidification solution also recently developed; repaired with a handmade paper, the maker of which still uses methods predating the industrial era; sewn by hand on a sewing frame identical to those used in the fourteenth century; covered with African tanned goatskin using

almost prehistoric tanning methods, stamped using binder's tools one to three centuries of age; and stored in stacks with twentieth-century protection and environmental control systems. In some libraries, such a volume may be used on an eighteenth-century table or desk beneath a portrait of the author painted from life. Thus it is that a preservation workshop may resemble both a contemporary science laboratory and a workshop in which a seventeenth- or eighteenth-century book binder would feel quite at home. A library moving into preservation may find that it already owns a considerable portion of the requisite equipment and that it is but necessary to reorganize its activities and add particular items needed to bring a preservation facility up to present-day expectations.

Supplies are continually required to keep an active program stocked with materials necessary for the full range of services to be rendered. Those doing the work are continually making inquiries of their suppliers for particular materials while the suppliers are continually adding to the range of items listed for sale. Also, these vendors will frequently fabricate items in sizes and shapes required for particular projects which permits a library to complete the work without having to adapt folders, envelopes, binders or other materials to the needs of the project. In recent years the escalation in the provision of convenience materials has proved most helpful to those faced with projects of considerable size and limited staff time to get the job done. Paper of all kinds has become increasingly expensive and the acid-free papers needed by conservators, together with other preservation products have not been exceptions. However, while prices have been increasing, the selection of materials as a whole has been improving. Production and availability of acid-free paper have increased in just the last few years. While the need for supplies is a continuing one, the needs of a particular conservation program will vary as the tasks vary, and institutions must be able to afford these materials if preservation programs are to continue.

Space as it relates to preservation is to be thought of in several different ways: space for the collections; space for the users of the collections; and space for working with the collections. Each should be adequate for its function. Storage space, or space for the collections, in particular, is a primary preservation element, and storage areas should conform to the criteria of temperature, humidity, light control, cleanliness, etc., which have been spelled out in the preservation literature. The same criteria apply also to reader space and to staff work space. In addition, the latter may also be subject to additional criteria for there is need for controlled ventilation to provide safe work areas for those using solvents and other chemicals required for some paper treatments. Space, like staff, is expensive, and must be used carefully.

Binding is, and will remain, basic to a well-conceived preservation program. It is not unusual to find incomplete and unbound periodical issues on library shelves in relatively poor condition while adjacent to them are similar issues of the same age which were bound while relatively new and which have survived in far better condition. Coupling binding and deacidification is a logical step once mass deacidification is available. If this is done, even on a selective basis, a longer usefulness is rather quickly assured for significant parts of research collections. Coupling the two operations has the advantage of achieving two major preservation operations with one handling, thereby helping to control labor costs.

With this brief consideration of linking deacidification with binding, I have slipped into the future, and it is there that I wish to continue. A second future development which seems to be more or less assured is an increased dependence on microforms as a preservation device. While microforms are not new, and while preservation is not a new use for them, there is growing emphasis on using microforms to preserve intellectual content when it is impossible or impractical to preserve original documents. The growth of cooperative programs to spread the burden of filming and to prevent needless duplication of effort in making microforms is both logical and desirable.

Other developments looming in the future are some consideration of nonprint and nonpaper media. While preservation-minded individuals have been learning how to preserve paper, libraries have broadened their missions to incorporate other newer media each of which has its own preservation needs and requirements; and still newer media continue to appear. The degree to which individual libraries will be called upon to preserve these materials has yet to be determined. Several of the newer media, in contrast with printed materials, would seem to be comparatively easily reproduced from master copies held by the issuing agencies or in a central depository so that availability may not become the problem it is with printed items. Major problems will likely be found in relation to collections of unique media materials such as sound transcriptions of local radio productions or recordings of important but noncommercial musical productions in university concert halls and similar facilities. Similarly, unique television and film materials from local stations and production facilities may also present problems to conservators and curators in widely scattered sites. All of these will require decisions and may generate preservation programs of their own as, indeed, some of them are already doing.

This completes my list of the three basic epistemological questions: (1) "Should a library preserve or conserve materials?"; (2) "What should be preserved?"; and (3) "How will they be preserved?" These are broad questions which involve all kinds of libraries, all levels of library staff, many library users and others involved in the affairs of the larger institutions to

which many libraries are attached. Each of these three questions has numerous subsidiary questions a number of which have been considered here.

Technical Questions or Decisions

As we move now to the technical or physical questions as Boorstin termed them, the emphasis will change somewhat. These matters relate more directly to the materials themselves and to what is to be done to them or with them than was true for the epistemological questions. Many of us are probably more comfortable and more at home in this area; however, if this discussion centers too much on particular problems and techniques for dealing with them, there is a danger that it may become too specific. Therefore detailed consideration of specific problems will be avoided as much as possible.

The basic problem area here is that of deciding to preserve the artifact itself, to preserve its intellectual content, or to attempt both. While technically almost any paper document in almost any condition, short of its being ash or dust, may be saved, the value of the document and the expense of preservation may be such that it is so impractical as to be impossible. Since we all must deal with practicalities, we must decide when the point of impracticality or impossibility is reached. In the working world of preservation the decision is frequently to preserve the intellectual content simply because the preservation of the original document is so expensive and the need for it so marginal that retention of the document becomes too great a luxury. Preserving the intellectual content of a document may be done in any one of several ways depending upon the particular situation. Alternatives include the following:

1. Procurement of a replacement copy if available;
2. Procurement of a copy of another or a later edition, if available and if suitable for the needs of the library;
3. Procurement of an electrostatic copy made from the worn original or from another copy in better physical condition;
4. Procurement of a microcopy or some other technologically more advanced reproduction.

Each of these ways of replacing materials presents its own set of problems. Buying either a new copy or a copy of a new edition requires that the title be in print or available on the used book market. Since the majority of titles stay in print for limited periods and relatively few titles ever appear in other than the original edition, the use of new copies to replace worn-out volumes becomes problematic for all save the most basic or most popular materials. The used book market, while helpful, requires time for searches

which are often expensive and not always successful. Serials tend to become unavailable even more rapidly in many cases than do monographs, and the time and expense of acquiring a sizable backfile on the used book market can become quite large very quickly.

Electrostatic copies also are not without their difficulties. Free and easy copying within libraries of materials under copyright and available for sale is controlled by the copyright law, so care in reproduction is needed. Old faded or stained materials tend not to copy well, and there are problems of size and extra bulk in some cases.⁴ Despite these problems and despite their cost, electrostatic copies are useful in many situations.

Preserving intellectual content by use of microforms is a recognized preservation technique and preservation microfilming is a term which has become commonplace in our vocabularies for a number of years. The use of film assumes that the materials which are to be so preserved are appropriate in the new format, that is, the material is largely textual and can be useful in other than paper form. Filming within a library, purchasing a film from another library, or purchasing a film from a commercial vendor are all common and accepted means of reducing brittle and bulky originals to film. If filming is done within a library, a master negative should be made, registered in the *National Register of Microform Masters*,⁵ and stored under appropriate conditions to serve as the basis of future copies. If film is acquired elsewhere, it should be safe to assume that a master negative exists in the vault of the vendor. There are two advantages in addition to the purely preservation aspect of preservation microfilming. First, film reduces bulk and helps libraries free space for more recent and presumably more heavily used volumes; and second, it provides the basis for the ready preparation of additional copies. In late 1979, as part of the work of the Task Force on the Preservation of the Association of Research Libraries (ARL) Collection Analysis Project in the Library of the University of Illinois at Urbana-Champaign, a very limited survey comparing costs of filming and binding periodicals was undertaken. This survey revealed that microfilm copies available from commercial sources compared favorably in cost with binding, but that those requiring original filming were two to five or more times more costly than binding.⁶ If libraries can organize preservation microfilming so as to divide the work of filming and making master negatives and then sell or trade service copies, the cost of the initial filming can be spread over many institutions and copies of useful and valuable resource materials can be made available much more economically than would be possible if libraries attempt to work independently. In this area bibliographical control becomes crucial as we have already been reminded several times in this conference.

Microfiche also has promise in preservation and dissemination of deteriorating and scarce materials. Like film, microfiche, once a master

negative is made, are easily and inexpensively copied. As institutions become increasingly interdependent and the lending of materials from institution to institution increases, microfiche would seem to be an excellent medium to permit dissemination of monographic materials, in particular, without subjecting aging and fragile originals to cross country transfer. This would simultaneously fill the needs of library users; provide master negatives of old and fragile materials, thereby lifting from them much of the wear and tear of use; and lighten the load on delivery systems since microfiche could be mailed as letter mail at much less cost than is involved in transporting the originals.

There are many instances when it is desirable both to prepare a microform and to retain the original. This is a practical way to make the content of rare books, manuscripts and other scarce, unique, or valuable materials available to users while taking the pressure of the use off the originals. This technique has been used widely both library to library and on a commercial scale. All of these reasons lie behind the inclusion of increasingly comprehensive photographic services as a major part of preservation programs.

Because everything can be expected to wear out, preservation is actually an attempt to make materials last as long as possible. Doing this is the general province of librarians as preservation policy is shaped and as particular approaches are adopted within libraries to achieve particular preservation objectives. As these techniques have tended to become more specialized and as the special techniques have required particular skills, preservation specialists and conservators have taken their places on library staffs. At some risk of leaving out or slighting some aspect of the preservation task, but in an effort to keep this presentation within necessary space limits, the following broad categories of preservation activity are indicated and described briefly:

1. *Preventive Measures:*

These measures are those things a library does or can do to reduce or halt certain kinds of wear and tear such as the training of staff to handle books and other library materials to prevent damage while shelving, transporting them on book trucks, packaging them for mailing, etc. Also included are good housekeeping to prevent infestations of insects, rodents, mildew and other problems in storage areas. Also to be considered here are the design and use of book returns which minimize wear and tear and the institution of safe storage conditions characterized initially as canons of the gospel of preservation having to do with temperature, humidity, light control and other environmental control measures.

2. *Binding:*

Binding is a basic preservation measure which provides essential physical protection and organization. Binding and rebinding are essential considerations in any preservation program.

3. *Storage Techniques:*

These techniques may be either temporary or permanent in their application to particular items or collections. They include tying volumes or groups of related items with tapes; wrapping and tying materials; tying materials between boards; inserting volumes into boxes; putting fragile materials into folders within boxes, portfolios, or boards, as well as many variations on these basic techniques which exclude light, dust, dirt, and polluted air. Such techniques provide physical protection and make it possible to shelve or otherwise store materials for extended periods of time. They may be used as interim measures to buy time while decisions regarding ultimate preservation are made, or they may be more or less permanent in and of themselves as in the case of rare books, collections of art prints, archives, and other similar materials. The use of acid-free wrappings, board, folders and other protective materials is mandatory if storage techniques are to be safely applied over long periods of time.

4. *Paper Preservation:*

Under this heading are a group of procedures the purpose of which is to increase strength and lengthen the period of usefulness of paper. Paper can be cleaned, washed, mended, recast, mounted, split, deacidified, re-sized, strengthened, laminated, and encapsulated, to name some, but not all, possible treatments. At their best, these processes can seemingly achieve miraculous results. Old, worn, dirty, stained, dog-eared and deteriorated papers may be restored to much of their original appearance and to some of their original durability. At their worst, attempts at these processes can become almost hideous parodies of the best applications and can be more destructive than leaving materials untreated. Paper preservation intended to be long-lasting should be done by those with skill, training, and experience in the work. The essential difficulty with paper preservation techniques is that they are very labor-intensive and, therefore, inherently expensive. There are, however, no real substitutes for them, though new techniques and materials continue to be developed which increase the efficiency with which these techniques may be applied.

5. *Book Repairs:*

Repairs range from relatively simple processes to more elaborate operations all designed to keep books in use. They are effective both in reducing binding costs by extending the usefulness of existing bindings and in permitting the retention of old bindings, thereby retaining the original structure and keeping appearance relatively unchanged. Such

repairs include tightening and repairing hinges, rehangng volumes in existing cases, repairing cases and reattaching them to the contents, and restoring worn bindings. All such operations are applicable to volumes made of paper, cloth and board. Volumes with leather or part leather bindings can be similarly repaired, restored, refurbished and returned to use, but they require particular attention to the leather, and, when repairs become more elaborate than simple cleaning and leather treatment, increasing levels of training and experience are needed. Book repairs, like paper preservation, are comparatively expensive because they require piece-by-piece application. They can be almost miraculous in their result when done by those with skill, training and experience. Similarly, when done by the unskilled or untrained, they can be ruinous and more destructive than leaving the book untreated.

6. Disaster Control:

What to do when fire, water, windstorm or other calamity strikes or threatens the collections of an institution is included here because of its importance in preserving collections. Planning for disaster requires participation of staff at all levels and in all parts of a library, and implementing plans when disaster strikes may involve not only library staff, but emergency service personnel, administration from outside the library, volunteers and others as well. At the heart of this planning and of its application should be those who know what to do—the conservator and conservation staff. These persons cannot be expected to deal with all that must be done when whole collections are involved, but they can provide the nucleus of knowledge needed to inform and coordinate the efforts of others in salvaging materials successfully.

This is a listing of basic areas of decision making related to preservation of materials in libraries. Time and space constraints prevent delving more deeply into details of particular problems or processes. As with the treatment of epistemological questions, the consideration of technical questions was reduced to a consideration of a small number of basic areas, first, the preservation of intellectual content; and second, the preservation of the physical object. There are major decision areas involved in both of these, several of which have been indicated.

Boorstin's two-part characterization⁷ of library preservation has been found to be a practical device for organizing this presentation, permitting the pulling together, in a particular order, of five basic questions or problem areas without consideration of administrative, operational, or other factors which might tend to relate to a particular kind of library or institution. These five broad areas are interrelated and their presentation includes the repetition of some elements under both major divisions. Such repetition was necessary as these questions were conceived, because it is

necessary that those making decisions affecting preservation but not particularly involved in day-to-day preservation activity have some knowledge of what is possible at the technical level and because the technical and operational staff must have some knowledge of the constraints and considerations affecting administrative decisions. Both the development of preservation policy and actually doing the work require contributions from all parts of the library. Users, administrators, curatorial or collection servicing staff, and preservation staff all must be involved for any part of it to work. Policy determination also requires ongoing cooperation in order that the policies be kept up to date reflecting and responding to the realities being experienced by all these groups. While preservation staff may have the words *preservation* or *conservation* in their titles, all those connected with a library are involved in preservation by virtue of their own titles, because all those connected with a library are involved in preservation in some way and to some degree; and all should have a voice in the development of preservation policy together with an understanding of that policy and their own part in its implementation. In addition, several levels of understanding of preservation processes and techniques are needed. The knowledge and proficiency of those involved in doing preservation work of a highly technical nature need not be shared by all other staff in order that the others may make appropriate and valuable contributions to the preservation policy and preservation program of an institution. Boorstin's characterization permits the making of these distinctions and this is one of its strengths. It is hoped that others will find it helpful and useful.

This presentation was introduced by the recounting of an experience in which a single old pamphlet was rescued from oblivion and a usable service copy prepared as its replacement on the shelves of a library. The major point of that account was the involvement of a number of people in the preservation process. I wish to close the presentation with an account of another preservation process. Like the introductory story this one, too, includes a number of people working at various points within a large library. It also includes several individuals from outside the library, and it is a preliminary report on the use of an industrial fungicide, orthophenylphenol, to combat a mildew infestation in a large and valuable collection.

In the autumn and early winter of 1980, mildew was found on the bindings of a limited number of volumes in one portion of the rare book collection of the library of the University of Illinois at Urbana-Champaign. Some of the first mildew found was removed with a dustcloth, and some found later was removed using a solution of thymol in alcohol. Subsequent infestation was found scattered over volumes on a single range of shelving; and, while attempts were underway to treat it with thymol vapor under a polyethylene tent, further infestations were found through-

out several parts of the stack area occupied by the rare book collections. These early evidences were on spines of bindings and other exposed edges of volumes. Some, growing on upper edges, seemed in some instances to be confined to incidental soil and dust which had accumulated on seldom used volumes. Ironically, the Rare Book stack is one of two storage areas in the library system which have, for approximately a decade, had controlled environmental conditions at least approximating those generally recognized as desirable or ideal. With the finding of the later rather widespread infestations, it was realized that without some more adequate means of control than spot treatment with thymol, the infestation would become worse and damage to the collections would be severe.

Contact was made with those responsible for the operation of the air handling system and their aid in controlling humidity sought. A campus mycologist sampled and identified the particular mold involved as a typical penicillium-type storage mold, and a phone call asking for help was placed to the Preservation Department of the Library of Congress. The call was referred to Dr. Robert E. McComb, a physical scientist on the staff of the department, who listened to my description of our problem and outlined a program of control. He recommended the use of orthophenylphenol (o-phenylphenol) as a control agent. This compound is much less expensive than thymol, vaporizes at room temperature at a rate sufficient to control infestations of the type we were fighting, and is not toxic to humans at the concentrations created by such vaporization. This compound is marketed in the United States by the Dow Chemical Company under the trade name Dovicide 1. In Britain it is marketed under the trade name Topane.⁸

Dr. McComb described the industrial uses of o-phenylphenol and outlined a mildew control program based on its use which included the following points. This initial oral recommendation was subsequently confirmed by letter⁹ and is summarized as follows:

1. Distribute o-phenylphenol throughout the area placing one or more small containers on each bookshelf.
2. Distribute o-phenylphenol in the air supply system by placing two or three small containers of it in each air supply vent.
3. Refill the containers at intervals of approximately three weeks, or more frequently as needed.
4. Cease any routine dusting, sweeping or similar cleaning in the area.
5. During the initial three months of treatment, clean floors, furniture, and other equipment, if at all, with a solution of one cup Lysol per gallon of water or one-half cup borax per gallon of water. Workers must wear rubber gloves and protect skin from either solution to prevent chemical burns.

6. After three months, mildew should be killed and may be removed from bindings using a 10 percent solution of orthophenylphenol in denatured ethyl alcohol. Workers must wear rubber gloves and protect skin from the solution to prevent burning. Cloths used in cleaning should be turned and changed frequently to prevent spreading dirt and stain from volume to volume.
7. After six months, vacuum cleaning may be resumed, and it may be used to clean books if desired if a wet/dry vacuum cleaner charged with a solution of one-half cup Lysol in one-half gallon of water is used. The filter of the vacuum should be thoroughly soaked with the fungicide solution to impregnate it thoroughly with fungicide.

This program was discussed within the library and checked out with the campus Division of Environmental Health and Safety which approved the use of o-phenylphenol in the fashion indicated. With the arrival of the first drum of 100 pounds of o-phenylphenol, the initial distribution of crystals was begun using three-ounce paper cups and surplus cardboard microfilm containers. The initial distribution was made by the staff of the Binding and Preservation Division in work sessions of about forty-five minutes to one hour each. All together nearly ten thousand small containers were employed to achieve distribution to all the shelves in the stack area dedicated to rare book collections. The initial order of fungicide provided coverage for about 60 percent of the shelves. A second drum of similar size was needed to permit us to complete the shelf-by-shelf distribution, as well as providing a reserve to permit refilling of cups and providing a supply for the ventilation system.

With completion of the shelf-by-shelf coverage, placing o-phenylphenol in the air ducts was initiated. A sample of the crystals was provided for the manager of the campus Operations and Maintenance Division unit responsible for operation of central air-conditioning equipment together with an outline of the mildew control program recommended by Dr. McComb. The air-conditioning manager indicated that it would require several days to check the compound in the technical laboratory maintained in his division and to determine its possible effects upon the air-handling equipment. While this check was in progress, he would review the design of the equipment involved to determine whether or not it might be possible to introduce the compound at a central point more easily and efficiently than at the individual vents.

At this time the project entered a new phase, as concern about possible risks of o-phenylphenol in the atmosphere reached a peak. A few members of the Rare Book Room staff became alarmed at the introduction of the chemical into the rare book storage area, fearing it would be a hazard to those working there; and the matter was reported to a Labor Education

Program group operating in the University's Institute of Labor and Industrial Relations. A staff member from this group investigated the project and consulted with an industrial hygienist on the staff of the institute who provided data on phenol and its compounds, including both o-phenylphenol and thymol, found in chemical handbooks and similar information sources. In working with these individuals we began to gain a somewhat broader view of the limits of knowledge of the effects of these chemicals. We had known for some years that certain individuals on our staff were somewhat more subject to nose and throat irritation by thymol vapor than were others; and Dr. McComb had indicated in our initial phone conversation that typically one person in ten thousand experiences some degree of allergic reactions to o-phenylphenol. As a consequence we had cautioned all those working with either compound to be aware of the possibility of irritation and to get out of contact with either should they experience any difficulty. Combining what we have learned about both thymol and o-phenylphenol from all sources, Environmental Health and Safety, the Industrial Hygienist, Dr. McComb, and our own experience, we have concluded that both compounds if used with care should ordinarily not prove hazardous. Direct contact with solutions of either should be avoided by use of rubber gloves and other protective clothing. Individuals who experience any discomfort when in contact with the vapors should get into fresh air. Persons with existing upper respiratory irritation are subject to increased irritation by either compound and should not subject themselves to either any more than necessary. Normal working periods in contact with either are usually limited to no more than an hour without a break taken in fresh air. Finally, all who will come into contact with the vapor are informed of its nature and possible effects and are instructed to leave the area if they become uncomfortable. No one is required to work with either compound.

As the problems of exposure to o-phenylphenol were still being discussed, the air-conditioning manager reported negatively to the request to place the compound in the ductwork, indicating that his conclusion was based upon two reasons: first, it was feared that o-phenylphenol might cause damage to the ductwork or other components of the air-handling system should any of it come into direct contact with the equipment; and secondly, it was feared that vaporizing the compound within the air system might increase its concentration in the atmosphere of the stack area too much to assure a safe environment for those working there. This development came as the school year was ending and as our student staff was dispersing for the summer. Labor for routine refilling of cups was scarce throughout most of the summer, though some effort was made to use occasionally available student help to refill cups from time to time.

By the time school resumed in late summer, it was apparent that our efforts had been insufficient to hold the mildew in abeyance. The staff of the Rare Book Room began to note increasing signs of mildew, some of it on front and back covers of volumes where they had been shelved snugly together, whereas most evidences found earlier had been on spines, upper edges and other similarly exposed surfaces. Some cups were empty or nearly so; and, in many which still contained what appeared to be sufficient o-phenylphenol to generate effective quantities of vapor, crystals were found to be sticking together or coalescing to form large chunks which apparently no longer vaporized fast enough to release sufficient vapor to be effective. Clearance was obtained to hire a student to devote ten hours per week to refilling cups, stirring those in which crystals were sticking together, and to begin routine cleaning of volumes using a wet/dry vacuum charged with Lysol solution. In addition, immediately after the student began work on a regular basis, small cheesecloth bags of o-phenylphenol were made up and suspended in front of the air supply vents with priority being given to those parts of the area in which mildew had been observed to be most prevalent. This program brought to an apparent halt further spread, and the initiation of the vacuuming program began to remove not only evidences of mildew but much accumulated soil and dust which had been providing germination sites for at least some of the mildew. In addition to these efforts, thymol solution and rubber gloves were provided for use by Rare Book Room staff in cleaning individual volumes found in need of it in the normal course of the operation of the Rare Book Room. Also, with the beginning of the 1981/82 heating season, the humidity level was operated at no more than 40 percent relative humidity rather than 50 percent which had been the objective for several years. The result of these efforts has been that no further outbreaks of mildew have been observed in the collections.

Many discussions attempting to identify the cause or causes of this outbreak of mildew have taken place, but no single factor or event has emerged as the culprit. By reconstructing the history of the operation of the air-handling system as best as it can be done from the memories of the staff of the Rare Book Room and some of the Operation and Maintenance staff who have serviced the system and by including in the consideration a number of other factors relating to mildew in general and to this library in particular, a general conclusion has been drawn that the area was inadvertently over-humidified for a sufficient period to permit mildew to begin to grow. A series of malfunctions of the air-handling system, which resulted in excessive humidification; consistent attempts through several winter seasons to maintain 50 percent relative humidity; and the design of the system as part of a larger air-conditioning system operated primarily to provide comfort air conditioning in the non-stack portions of the Univer-

sity Library building which cause it to maintain summer humidity no lower than 60 percent and to operate with untreated air for extended periods in spring and fall, all seem to have combined to provide the environment needed to cause the problem.

O-phenylphenol has proved to be an effective part of the mildew control program when the library staff has been able to keep an adequate supply of the chemical in the affected areas. Its use, coupled with humidity control and a continuing cleaning program, serves both to inhibit spread of mildew and to prevent the start of new infestations.

The foregoing narrative is quite condensed and does not clearly indicate the parts played by all who have been involved. Mildew was first seen and reported by a student assistant retrieving a volume for patron use. Professional and support staff in the Rare Book Room have been involved in every phase of the struggle. Library administrators cleared the way to acquire o-phenylphenol, suggested calling in a mycologist, and approved the hiring of extra student staff. Library business office staff and campus Purchasing Division staff expedited orders for fungicide and related supplies. The entire staff of the Binding and Preservation Division helped with the initial distribution of fungicide. Janitorial and maintenance staff altered work routines and schedules. Operation and Maintenance Division staff provided information about and service on the air-handling system. The Labor Education Program and Environmental Health and Safety staffs provided information and counsel. And, perhaps most important, Dr. McComb shared with the library information at his disposal concerning a new technique for using o-phenylphenol in a library situation. This experience is continuing, and the final word recounting it will not be written for some time, but this progress report illustrates again the need for involvement of people at many levels, with many skills and with many points of view to provide for the preservation and protection of library materials.

NOTES

1. Boorstin, Daniel J. "Welcoming Remarks." In *A National Preservation Program; Proceedings of the Planning Conference*. Washington, D.C.: Library of Congress, 1980, p. 12.
2. Webster's Third New International Dictionary, unabridged, s.v. "epistemology."
3. Boorstin, "Welcoming Remarks."
4. Bork, Helga. "Microforms." In *Preservation of Library Materials*, edited by Joyce R. Russell, pp. 71-76. New York: Special Libraries Association, 1980.
5. *National Register of Microform Masters*. Washington, D.C.: Library of Congress, 1976-.
6. Austin, Mardell, and Henderson, William T. "A Comparison of the Costs of Binding and Microfilming Periodicals." In *Report of the Task Force on Preservation*. University of Illinois at Urbana-Champaign: Collection Analysis Project, 1980, p. 169.

7. Boorstin, "Welcoming Remarks."
8. Horton, Carolyn. "Saving the Libraries of Florence." *Wilson Library Bulletin* 41(June 1967):1043.
9. McComb to Henderson, personal communication, 17 April 1981.

ADDITIONAL NOTES

- Baynes-Cope, A.D. *Caring for Books and Documents*. London: British Museum Publications, 1981.
- Clapp, Verner W. *The Story of Permanent/Durable Book-Paper, 1115-1970* (Restaurator Suppl. No. 3). Copenhagen: Restaurator Press, 1972.
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DISCUSSION

Douglas DeLong (Library, Illinois State University, Bloomington): You made reference to, in the future, combining regular commercial binding and deacidification. Do you feel there will be any problems with the typical oversewing methods used by most commercial binders—e.g., the threads that are used in this deacidification process? In other words, twenty years down the road, will the threads be falling out and the papers be fine? What are your thoughts on this?

William T Henderson: We all know what happens with existing papers and sewing. If we can slow down or halt the degradation of paper we can perhaps lengthen its life and the sewing technique won't be so all-important as it has tended to be with some materials in the past. Another thing I'm heartened by is the fact that we are getting away from the very heavy use of oversewing as it has been used for many years. A broader array of kinds of sewing and other techniques are available than was previously the case, and the use of adhesive bindings seems to hold promise for future usefulness as well as giving us volumes that open easily now.

Gerald Gibson (Library of Congress, Washington, D.C.): Would you talk about fumigation, and, secondly, about ink and the effect that ink has itself and in combination with other materials?

Henderson: I'm not all that knowledgeable about either ink or fumigation. On the latter, I can't say much except to say that we've been fortunate here and in my experience in not having too much difficulty with the kinds of problems that call for massive amounts of fumigation. Available informa-

tion about the UIUC Library, some of which predates me by a long while, indicates that the Library has had small mildew problems from time to time. For some reason we seem not to have been bothered by insects and we also have reasonably tight buildings and have not had too much of a problem with rodents. For mildew control in the recent past we have depended primarily upon thymol. At one time we used mercuric chloride which we gave up very quickly when we found out what it did to paper if too much was used. I'm becoming more interested in the use of Dowicide because I think the problem in our Rare Book Room stack is going to be with us as long as we have our present ventilation system. I'll have to beg off regarding inks because I simply don't know.

Gibson: Is ink, then, not particularly a problem with paper materials? It certainly is a problem with nonpaper materials with the combination of dyes and inks that are fixed to, as I mentioned in my session, a paper label on a sound recording. There is a major complication.

Henderson: Some inks, as I have had a chance to think a little more, particularly the old iron gall inks that were widely used in manuscript materials, can give rise to problems if they were not properly made in the first place. They can, in such cases, become quite acid and over a long period cause browning and embrittlement and, finally, destruction of the paper. Printer's ink, as it has typically been put together and as I understand it, is basically carbon which essentially lays on the paper more or less indefinitely. Some writers have mentioned problems stemming from other particular types of inks. As for phonograph record labels and other materials of similar nature, I suspect that the colored dyes used are probably the cause of the problems, or at least a part of the cause. I think these are some of the things that you probably would find would vary almost from one printer's lot to another. I doubt if any record producer ever tried to fix a particular standard or recipe for dyes used in making their labels. Don [Krummel], can you lend some aid here?

D.W. Krummel (Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign): Let me add a note on this, and then an appeal. As far as I know nobody is very much bothered about ink. I'm not sure why. Somehow I think we should be but I don't think any of us are. The one area where I think it is a problem is with photographs, and there, of course, it's not ink as used by printers. But the printing material is a problem when it comes to deteriorating photographic copies.

Henderson: Louise Kuflick has just told me that she will be mentioning ink this afternoon in her presentation. She and those she works with have found that it sometimes presents some problems in doing some of the deacidification processes.

Gibson: May I talk some more about ink? One problem, particularly with manuscripts (which is completely out of my area of work)—but I would caution people in deacidifying, especially manuscripts—is to make sure that the ink you're treating is not going to be soluble with whatever you're using. The manuscript of Berg's opera *Wozzeck* in the Library of Congress has some beautiful comments in the composer's hand in the manuscript and in the margin of the manuscript in red ink. The paper was tested. The ink which he had used to write the manuscript and the pencil marks he used have been tested, but the red ink wasn't tested. In the deacidification process a number of the pages of this manuscript are a beautiful baby pink. The comments are no longer in existence. There was a microfilm made of it before it was deacidified but the original simply does not carry the information anymore. So be particularly careful in deacidifying.