

## Preserving Print Legal Information\*

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*Ms. Seo reviews the preservation options for print materials and considers current efforts by law and other disciplines. She suggests how law librarians should proceed in the future to address the challenge of preserving deteriorating legal materials in print.*

¶1 Subject to aging and deterioration, library collections usually contain a significant percentage of books in brittle and fragile condition, while many more are highly acidic and at risk of becoming brittle. In particular, many volumes published within the last 150 years have rapidly deteriorated while earlier publications remain surprisingly supple. The difference can be attributed primarily to the introduction of wood-pulp papers in the mid-nineteenth century. These papers have a variety of properties and characteristics that contribute to their accelerated deterioration, including acids, lignin, and other impurities. Whether left during the papermaking process, intentionally added to alter paper quality and characteristics, or later introduced through airborne pollutants, acids in paper catalyze the hydrolysis of cellulose fibers, rendering them shorter, weaker, and, over time, brittle. Another contributing factor to the degradation of paper is lignin, which is often referred to as the glue that bonds fibers together in wood and provides structural strength for plants. These lignins also break down over time, especially with exposure to light, causing paper to discolor and depositing acidic by-products into the paper.

¶2 To compound the problem, environmental factors such as exposure to light and pollutants, and high or fluctuating temperatures and relative humidity, further accelerate the deterioration process. In these unstable or extreme conditions, hygroscopic materials expand and contract, experiencing chemical and physical changes that lead to desiccation.

¶3 Although some brittle books remain usable and can be left on the shelves with little fear of content loss, many more have been poorly treated and stored, and have been rebound in ways that exacerbate the problem. In response, librarians prioritize preservation needs and select from a number of options to preserve their brittle collections. The purpose of this article is to explore some of these options and to offer suggestions as to how law libraries should proceed in the future to address the challenge of preserving deteriorating legal materials in print.

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## Preservation Options for Print Materials

¶4 Beyond proper handling and providing appropriate and stable storage conditions, there are several options for treating acidic and brittle materials. Among these options are reformatting, deacidification, and paper splitting, all of which have advantages and disadvantages. This article focuses on these three options because recent advances have made them attractive in terms of preservation. But one should also keep in mind other traditional preservation activities, such as custom housing, conservation or repair treatment, and commercial library binding, that continue to be acceptable and appropriate options for preserving print materials.

### *Reformatting*

¶5 In the area of reformatting, a variety of options are in use today, including preservation photocopying, preservation microfilming, and digital imaging.

### *Preservation Photocopying*

¶6 Preservation photocopying is an analog reformatting process that involves photocopying or scanning and printing brittle pages onto permanent paper, and then binding to meet ANSI/LBI (Library Binding Institute) standards.<sup>1</sup> The current paper standard<sup>2</sup> requires that permanent durable paper meet the following criteria:

- a pH in the range of 7.5 to 10 (7.0–10.0 for coated papers);
- minimum average machine direction tear index of 5.25 mNm<sup>2</sup>/g (3.50 mNm<sup>2</sup>/g for coated papers);
- an alkaline reserve equivalent to at least 2 percent calcium carbonate; and
- lignin content not in excess of 1 percent by weight.

¶7 The chemical impact of lignin in paper is complex. While it does not appear that the acceptable content level has changed from earlier versions of the standard, research in the mid-1990s suggested that the deleterious effects of lignin in an alkaline environment are limited to altering optical properties of paper, not its mechanical and chemical stability.<sup>3</sup>

¶8 Preservation photocopying has a number of advantages. The process results in a preservation surrogate that users are comfortable with—a book. It also significantly reduces demand for the brittle original, thereby facilitating preservation of the

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1. AM. NAT'L STANDARDS INST., LIBRARY BINDING: AN AMERICAN NATIONAL STANDARD (2000), available at <http://www.niso.org/standards/resources/Z39-78.pdf>, describes acceptable binding techniques and material specifications for first-time binding and rebinding of books intended for library use. This standard is designed to guide commercial library binders to use methods and materials that are stable and durable, and that do not cause more damage to the text block.
  2. AM. NAT'L STANDARDS INST., PERMANENCE OF PAPER FOR PUBLICATIONS AND DOCUMENTS IN LIBRARIES AND ARCHIVES (1992), sets the basic criteria for coated and uncoated papers that will last several hundred years under normal use.
  3. See P. Begin et al., *The Impact of Lignin on Paper Permanence: A Comprehensive Study of the Ageing Behaviour of Handsheets and Commercial Paper Samples*, 19 RESTAURATOR 135, 146–51 (1998).

artifact itself. Preservation photocopying vendors recently have shifted to digital image capture and away from photocopying technologies, allowing them to provide digital images as well as reprinted volumes. While questions of delivery methods and costs remain for these data files, and the persistence of digital files remains in question, this digital by-product may hold great promise for increased access.

¶9 Furthermore, much like preservation microfilming, preservation photocopying can serve as a collaborative preservation activity, as opposed to treatments such as mass deacidification that are limited in their impact to the local copy. The *Anglo-American Cataloging Rules*<sup>4</sup> and Library of Congress guidelines suggest each reprinted title receive a separate bibliographic record from the original, easily identifying it as a preservation copy. According to the *Library of Congress Rule Interpretations*, “[t]hese guidelines identify the data elements to be used in the record for the reproduction, separate from the record for the original.”<sup>5</sup> Consistent practice in this area, combined with more fully developed standards for preservation photocopying methods and materials, will enable preservation photocopying to serve as a national cooperative preservation and access method. Widespread use of standardized bibliographic documentation shares preservation information, thereby helping to limit duplication and dilution of preservation efforts and facilitating the acquisition of preservation replacement copies.

¶10 But there are also drawbacks to this method. Preservation photocopies usually take up slightly more shelf space than the originals due to heavier weight paper and binding materials used, and twice the shelf space is required if a library also retains the original volume. They are relatively expensive to create and bind. Finally, there may be loss of or damage to the original when copying. Most often, originals are disbound for preservation photocopying to increase efficiency and reduce costs. And extremely brittle pages frequently break during the capture process.

#### *Preservation Microfilming*

¶11 A second solution is preservation microfilming. Advantages of this process include the existence of preservation standards clearly defining methods and materials, environmental standards designed to slow film deterioration, and a triple film system (preservation master, duplication master, and local use copy) that is common practice. In addition, microfilming is space-efficient, it is easy to film large materials such as newspapers, and it constitutes a collaborative national approach to preservation and access since each title filmed receives a separate bibliographic record from the original. This cataloging practice easily identifies it as a preservation copy, and the shared information facilitates the purchase of duplicate copies by other libraries and reduces duplication of effort.

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4. See JOINT STEERING COMM. FOR REVISION OF AACR ET AL., *ANGLO-AMERICAN CATALOGUING RULES*, rule 1.11A (2d ed. rev. 2002).
  5. 1 *CATALOGING DISTRIBUTION SERV., LIBRARY OF CONGRESS, LIBRARY OF CONGRESS RULE INTERPRETATIONS*, Rule Interpretation 1.11A (2d ed. 1998).

¶12 The major drawback to microfilm is that users do not like it. They find it difficult to use, and some even find the experience nauseating. While microfilming may be satisfactory for newspapers or journals because of the brevity of articles, researchers tend to prefer a book format for longer treatises and materials in which they compare texts, such as codes. There may be loss of or damage to these fragile originals during microfilming. Finally, reduction ratios are sometimes inconsistent if guidelines and standards are not strictly adhered to.

¶13 Current trends designed to improve microfilm's usability include digital microfilm readers that improve viewing, printing, and electronic delivery. Some systems, depending on software, also enable downloading, optical character recognition, and conversion to PDF or other file formats. Scanning extant microfilm is now also possible, though there may be difficulties scanning older film because of a lack of stop blips, poor quality, low density, scaling issues, and loss of information due to second-generation conversion. Faithful color microfilm that is expected to last many centuries<sup>6</sup> is also currently provided by select microfilm vendors.

¶14 Microfilming now has the advantage of tested methods with standards and known shelf lives. In addition, there is no need for complicated hardware or software to access the information stored on microfilm, while digital microfilm readers and printers continue to improve accessibility, use, and delivery of microfilm materials.

#### *HD Rosetta*

¶15 Like microfilm, HD Rosetta is an analog microtechnology.<sup>7</sup> The technology was developed at the Los Alamos National Laboratories in the mid-1990s as HD-ROM to store information on a permanent and durable medium that is not dependent on proprietary software or hardware. The process begins with digital files as the input (electronic files or scanned pages). Data can be stored as binary or pixilated data, making it possible to store images, computer data, sound, and video on one disk. For eye-readable text or graphic formats, the image of each page is etched onto a noncorrosive metal disk with a maximum resolution of 4000 x 4000 pixels, or 300 dpi for an 8½-inch by 11-inch page, that can hold up to 196,000 images (readable with an electron microscope) or 5000 to 17,000 images (readable with an optical microscope). The technology can also represent grayscale and color.

¶16 Since reading a book may be uncomfortable through a microscope, Norsam has developed a special reader that locates the image based on x/y coordinates and then displays it on a computer monitor. The resulting digital image can be OCRed, e-mailed, printed, etc., depending on software capabilities. Regardless of how the digital images are converted, manipulated, and stored, unaltered mas-

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6. See generally IPI: *Color Microfilm Dark Stability*, 21 MICROFORM REV. 142 (1992).

7. For additional information, see NORSAM TECHNOLOGIES, HD ROSETTA ARCHIVAL PRESERVATION SERVICES, at <http://www.norsam.com/hdrosetta.htm> (last visited July 20, 2004).

ter copies remain etched on the disk. These masters cannot be altered or corrupted as with digital formats.

¶17 For preservation purposes, the fewer images per disk the better. It is recommended that 1000 to 2500 images are used per disk to improve resolution and because lower resolution microscopes can be used to render the image legible. Preliminary cost estimates are still high for this reformatting option compared with preservation photocopying and microfilming, but as with all new technology and services, prices tend to drop with new business models.<sup>8</sup>

### *Digital Imaging*

¶18 Digital imaging, which is slowly being accepted as a preservation reformatting option, offers several advantages over analog preservation formats. These include remote and concurrent access to materials, full-text search capabilities, and space savings. That said, preservation is a by-product of digital reformatting when the original is stored properly and access is given only through the digital surrogate or if another preservation surrogate such as microfilm is generated. By relying on an analog format for preservation and the digital version for access, this hybrid approach uses the advantages of both formats while compensating for their limitations or drawbacks.

¶19 Considering the problems digital formats currently pose for preservation—including instability of storage media, technological obsolescence, lack of standards, and unknown storage and maintenance costs for digital masters over time—most libraries and archives are relying on a hybrid approach that incorporates both a proven analog format for preservation and a digital format for access with the future possibility of using the electronic version as the preservation copy. The hybrid approach satisfies preservation requirements and the expectations of library and archives patrons.

### *Deacidification*

¶20 Quite apart from techniques based on reformatting, some libraries have opted to use mass deacidification to extend the life of their acidic books that have not yet become brittle. Mass deacidification is a nonaqueous chemical process designed to neutralize acids in bound volumes while depositing an alkaline reserve to mitigate against future acid formation on the paper often introduced through airborne pollutants. Because volumes are not disbound and treated page by page, this preservation option has many advantages over reformatting. The mass treatment of bound volumes means that it is certainly more efficient and economical than reformatting options, there is less handling of the original, and it helps to preserve the artifact in its original format. Little selection of materials is necessary since most binding materials can be treated without adverse effect. Loose, archival, or manuscript materials also can be treated with this technique.

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8. Telephone Interview with Ken Harrington, Process Engineer, Norsam Technologies (Jan. 15, 2003).

¶21 The most significant drawback to this option is that it is not appropriate for brittle materials. This treatment does not re-hydrate or add any strength to brittle and fragile paper; to date there is no known method of doing so. Furthermore, as a relatively new process, only accelerated aging tests are available to validate its efficacy.

¶22 Currently two companies are offering this service: Preservation Technologies (Bookkeeper process) based near Pittsburgh, Pennsylvania, with treatment facilities in Pennsylvania and Gatineau, Quebec; and Zentrum für Bucherhaltung GmbH (ZFB) in Leipzig, Germany.

### *Paper Splitting*

¶23 Paper splitting, a third approach for preserving print sources, is a conservation treatment that involves physically splitting or delaminating brittle paper by carefully peeling the front and the back sides of a piece of paper apart and very precisely rejoining the halves with a new piece of thin but strong and flexible alkaline paper sandwiched in between. The focus of this treatment is on preserving both the artifact and the intellectual content. While it does preserve the artifact, the treatment is intrinsically very invasive and irreversible, even though the alteration is nearly imperceptible when the treatment is performed well. Paper splitting may be a good option for valuable artifacts that are particularly fragile and difficult to handle such as maps, unbound newspapers, and broadsides. It is available as a fully mechanized mass treatment process.<sup>9</sup>

¶24 The primary drawbacks include the intrinsic invasiveness of the technique and that it may be impossible to reassemble the work in its original case due to the increased page thickness. In addition, as a fairly new treatment, more testing is needed.

### **What Have Other Disciplines Done?**

¶25 In 1986, the Council on Library Resources developed a national plan to preserve the most significant research collections in the United States that were at risk due to brittle paper. The goal of the Brittle Books Program was to build an accessible national collection of preserved materials.<sup>10</sup> The effort required the development of a nationwide, collaborative, large-scale filming program to capture the intellectual content of brittle books and to provide bibliographic control to identify and locate master copies. The National Endowment for the Humanities (NEH) funded the program for preservation microfilming three million titles identified as the “essential core collection.” Unfortunately for law collections, the

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9. For additional information, see Zentrum für Bucherhaltung, at <http://www.zfb.com> (last visited July 20, 2004). ZFB offers mass paper splitting at its facility in Leipzig, Germany.

10. See generally COMM. ON PRESERVATION & ACCESS, COUNCIL ON LIBRARY RES., BRITTLE BOOKS: REPORTS OF THE COMMITTEE ON PRESERVATION AND ACCESS (1986).

role of the NEH and its funding for the project meant that more attention was paid to humanities research collections than to those in areas such as law and science and technology.

¶26 The United States Newspaper Program (USNP)<sup>11</sup> was established in the early 1980s to locate, catalog, and microfilm U.S. newspapers dating back to the eighteenth century.<sup>12</sup> Like the Brittle Books Program, USNP was also funded by the NEH. The Library of Congress has provided project management and technical support, while organization and project activities have occurred at the state level. One local organization acts as the lead agency to coordinate each statewide effort.

¶27 Another national effort to preserving brittle collections is Brittle,<sup>13</sup> an electronic discussion list-based cooperative program founded by the University of Kansas Libraries (and currently managed by OCLC) to provide preservation photocopying of brittle materials, mostly in the humanities. Participating libraries submit titles of volumes they plan to preservation photocopy. OCLC staff members compile and periodically share these title lists with all participating libraries. Participating libraries then have the opportunity to select titles from the list and request a copy through the Brittle discussion list. As more libraries request a preservation reprint of a particular title, the cost per copy decreases. OCLC coordinates functions such as billing and invoicing and physically preparing volumes by cleaning, collating, and digitizing them. Facsimiles are printed and bound by Heckman Bindery. This centralized approach cuts down on duplication of effort, minimizes errors, and provides libraries the opportunity to purchase preservation reprints to replace brittle originals, retrospectively fill in missing volumes when the volumes are out of copyright, or add out-of-print titles their collections lack. According to OCLC, an online database of preserved titles available as print-on-demand and the expansion into specialized subject areas beyond the humanities are expected.<sup>14</sup>

### What's Happening in Law?

¶28 In terms of condition, law collections are not healthy. According to Robert Mead and Brian Baird, the percentage of brittle books in the collection of the University of Kansas Law Library is 12.53 percent,<sup>15</sup> twice as high as all other University of

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11. See NAT'L ENDOWMENT FOR THE HUMANITIES, U.S. NEWSPAPER PROGRAM, at <http://www.neh.gov/projects/usnp.html> (last visited July 28, 2004).

12. LISA L. FOX, PRESERVATION MICROFILMING: A GUIDE FOR LIBRARIANS AND ARCHIVISTS 13 (1996).

13. For additional information, see Brian J. Baird, *Brittle: Replacing Embrittled Titles Cooperatively*, 58 C. & RES. LIBR. NEWS 83 (1997); BRIAN J. BAIRD, BRITTLE, at <http://www2.lib.ukans.edu/preservation/Brittle.htm> (revised Mar. 24, 2004).

14. News Release, OCLC, OCLC Preservation Services to Manage Brittle Cooperative (Apr. 28, 2004), available at <http://www.oclc.org/news/announcements/announcement95.htm>.

15. Robert A. Mead & Brian J. Baird, *Preservation Concerns for Law Libraries: Results from the Condition Survey of the University of Kansas Law Library*, 95 LAW LIBR. J. 69, 74, 2003 LAW LIBR. J. 3, ¶ 13.

Kansas libraries. Similar survey results at Georgetown Law Library document a 12 percent brittle rate.<sup>16</sup> These results suggest that American law library collections may contain a higher percentage of brittle materials than other disciplines. Another disturbing trend identified by the Kansas survey is the greater prevalence of red rot, five times higher within the law library's collection than those at the other libraries of the university. This is not surprising considering the amount of split sheep used on nineteenth- and early twentieth-century North American law books; Mead and Baird note that the law library has a higher percentage of leather-bound books than do other libraries on the Kansas campus.<sup>17</sup>

¶29 As for the amount of acidic materials in law collections, the percentages are similar to collections in other disciplines. The Kansas survey found 65 percent of the randomly sampled collection to be acidic (pH of approximately 5.5 or less),<sup>18</sup> while the Georgetown survey found 60 of the books sampled to be acidic at a pH of 3 or 4.<sup>19</sup> This is a significant portion of law collections that, if left untreated, will become brittle. Luckily, more than 88 percent of the University of Kansas Law Library's volumes surveyed from the 1990s were printed on acid-free paper.<sup>20</sup> So while the older legal collections are deteriorating, at least most of the current publications are not compounding and perpetuating the problem.

¶30 Commercial sectors have responded to librarians and library associations by publishing more titles on acid-free or, even better, permanent paper. They have also engaged in valuable reformatting and republishing efforts. Law Library Microfilm Consortium (LLMC) and William S. Hein & Co. have provided a useful service in preservation reformatting legal materials, especially secondary sources such as law journals and treatises. They have done this through preservation microfilming and photocopying, and are now moving into digital formats for improved access.

¶31 Although LLMC, Hein, and other micropublishers have been responsive to some of the needs of law libraries, there still remains a large body of print legal materials at risk. Some law libraries are attempting to address this problem through their own preservation projects. Unfortunately, many of these projects are being carried out by individual institutions with little or no effort made to promote their preservation activities.

¶32 The Georgetown University Law Library has pursued several reformatting projects targeting specific collections. The largest of these endeavors has been the Historic State Codes Preservation photocopying project, including all fifty states and the District of Columbia from 1840 to 1930. The intent was to preserve the

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16. Linda Nainis & Laura A. Bedard, *Preservation Book Survey in an Academic Law Library*, 78 *LAW LIBR. J.* 243, 251 (1986).

17. Mead & Baird, *supra* note 15, at 77, ¶ 18.

18. *Id.* at 74, ¶ 13.

19. Nainis & Bedard, *supra* note 16, at 252–53.

20. Mead & Baird, *supra* note 15, at 75, ¶ 15.

historic state codes in a format that is helpful to the user, to develop a comprehensive preservation collection with contributions from many libraries, and to have other permanent collections available across the country. George Washington University Law Library and Hastings Law Library have purchased the entire collection, while other libraries have purchased titles to replace deteriorated copies or fill in gaps for their jurisdictions. A list of reprinted titles from this project is available through the Georgetown Web site.<sup>21</sup>

¶33 Although slowed by recent budget cuts, the Connecticut State Library is currently preservation photocopying Connecticut state statutes. This project was selected based on two criteria: (1) the highest demand materials, and (2) the most deteriorated. Although this project duplicates a small portion of the Georgetown Historic State Codes Preservation project, it was felt that the annotations referencing amendments to the sections included in the state library's reference copies were important enough to justify the effort. Like the Georgetown project, the decision to preservation photocopy as opposed to microfilm was influenced by user preference: researchers need to be able to view several volumes at the same time. Multiple copies of the years selected were scanned, printed, and bound for the reference and stacks collections. It is hoped that a future project will mount the scanned pages for public access and additional years will be preservation photocopied.<sup>22</sup>

¶34 The state library's reformatting of the *Public Records of the Colony of Connecticut 1636–1776* led to a joint venture with the University of Connecticut.<sup>23</sup> The university intended to digitize its microfilm copies of these volumes, but discovered that the quality was less than desirable. The two institutions collaborated, and the digital collection was generated from images captured from the originals during the preservation photocopying process.

¶35 Another significant law preservation project is being carried out by the University of Michigan Law Library. Michigan is currently mass deacidifying roughly 244 volumes each month from its foreign law collection as well as books that are sent for rebinding. To save time, the librarians have chosen not to use a title selection process, but instead are approaching the collection alphabetically by country and identifying acidic materials that are stable enough for mass deacidification. The item records are updated with a circulation note that indicates the volume has been deacidified and the date of treatment. Currently, no database is available so the information cannot easily be shared with other libraries.<sup>24</sup>

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21. See EDWARD BENNETT WILLIAMS LAW LIBRARY, GEORGETOWN UNIV. LAW CTR., HISTORIC STATE CODES, at [http://www.ll.georgetown.edu/states/historic\\_codes/index.cfm](http://www.ll.georgetown.edu/states/historic_codes/index.cfm) (last visited July 20, 2004).
  22. Telephone Interview with Jane Cullinane, Library Specialist in Preservation, Connecticut State Library (Jan. 13, 2003).
  23. See UNIV. OF CONN. LIBRARIES, COLONIAL CONNECTICUT RECORDS 1636–1776, at <http://www.colonialct.uconn.edu> (last visited July 20, 2004).
  24. E-mail from Bobbie Snow, Head of Circulation, University of Michigan Law Library, to Hilary Seo (Jan. 28, 2003) (on file with author).

¶36 The Harvard Law Library is pursuing both reformatting and mass deacidification for its collections. Along with titles filmed through LLMC and the nineteenth- and twentieth-century legal treatises project, Harvard also preservation reformats titles as necessary using both preservation microfilming and photocopying vendor services. In 2003, it began mass deacidifying the international law collection, starting in the middle of the collection and proceeding by call number, at up to 100 volumes per week, with a target of 2000–2500 volumes per year. All volumes deacidified are sent to an off-site storage facility with improved climate control.<sup>25</sup> It was felt that this was a cohesive collection, but after two years the project will be re-evaluated.

### **Where Do We Go from Here?**

¶37 Law libraries cannot meet the preservation challenge by acting alone. No single institution can afford to preserve everything in its collection and not everything needs to be preserved. Collaboration with other libraries will ensure that more items are preserved and more comprehensive preservation collections are created. Also, by working together and identifying what has been done, duplication of effort can be reduced.

¶38 Whether through creating catalog records for preservation reformatted titles or through collaborative projects, it is vital to share information about titles and collections that have been preserved to avoid duplicating effort and so that other libraries are able to purchase preservation copies when available. It is hoped that in the future law libraries will develop the means for a thorough sharing of information, both on work currently being done and on the techniques that can help to preserve their collections.

¶39 Law librarians will need to continue to talk with publishers to ensure a commitment to continued commercial availability of publications. The purchase of commercial replacements is generally more economical than local reformatting efforts. Many publishers have already responded to the initial request by law librarians for the use of permanent paper. Scholarly publications are now largely printed on acid-free paper, but there are still preservation concerns with regard to deteriorating print publications and electronic information.

¶40 In the absence of a national agenda, preservation often falls through the cracks. Law library preservation needs are too big, too complex, and far too important to be left to chance. A cooperative effort, with a strong commitment from key stakeholders, is called for to carry out the necessary preservation agenda.

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25. Telephone Interview with Will Meredith, Preservation Librarian, Harvard Law School Library (Jan. 16, 2003).