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What, No Backups? Preserving Hardcopy Newspapers in the Digital Age

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Abstract:

Decentralizing and distributing digital copies is a guiding tenet behind the strategic preservation maxim, "lots of copies keep stuff safe." Yet in the United States, retaining original, hardcopies of newspapers as backups following digitization is not a priority. This predisposition to duplicate and discarding encourages cutting bound newspapers to expedite scanning, a philosophy rooted in economic constraints imposed by grant-driven U.S. newspaper digitization funding. National Endowment for the Humanities (NEH) has historically limited fiscal support for hardcopies to preparation for image capture only based on the longstanding premise that microfilmed copy become "the object of record." Partnering with Library of Congress (LC), NEH mandates digitizing from microfilm whenever possible, regardless of image quality, and LC has historically supported guillotining bound volumes for copying purposes followed by their disposal. This predilection toward destroying historic newspapers to preserve them has undermined long-term preservation strategies in the U.S.

Newspapers are complicated. The Salt Lake Tribune, for example, produced five editions per day. Which is 'the object of record?' What historic differences exist? Color images 'preserved' with black and white microfilm are forever due to the medium's technological limitations. Ongoing use of original newspapers as "leaf masters" (a term coined by conservator Gary Frost) remains a necessity to overcome intellectual uncertainties and technologically inadequacies. Even in fragile condition, newspaper leaf masters serve as: 1) backups to regenerate screen copies; 2) master copies, to augment, enhance, or correct faulty screen copies; and 3) authentication, to provide forensic evidence about original production techniques.

Undermining the broadly held U.S. misperceptions that once digitized, hardcopy newspapers become superfluous, this paper emphasizes the importance of retaining hardcopy primary source material in perpetuity. Use of custom designed polyester folders, Coroplast boxes, and environmentally controlled storage conditions to store one state's historical newspapers will be discussed.

Keywords: Newspaper preservation, microfilm, national delusion.

Slow Fires Flimflam

In 1987, filmmaker Terry Sanders released *Slow Fires: On the Preservation of the Human Record,*[1] a documentary addressing what U.S. libraries called 'the brittle books crisis.' Narrated by former television news anchor Robert MacNeil, the movie documents the hypocrisy that succeeded in destroying most of America's historic newspapers in the name of preservation. Midway through the hour-long film, Mr. MacNeil's caramelized voice communicates Mr. Sander's central theme: "It is neither flood nor fire that is the true enemy of the human record," but rather, "the slow fires—the acid embedded in the paper—that remains the greatest threat."

The Northeast Document Conservation Center (NEDCC) pans into view and a technician clothed in a white lab coat lifts an oversized, bound newspaper from a shelf to move it to an empty worktable. She opens the heavy volume's front cover, inserts the tip of a box cutter into the book's cloth joint, and deftly slices the board from the text block. "The only documents that we'll consider to guillotine [at NEDCC] are newspaper collections," she explains, "the kind that have been put in a giant volume to be stacked on a library shelf."

The binding's brown paper lining now exposed, the technician swiftly works the razor-tipped utility knife lengthwise down the book's spine, splitting the intact, chunky volume into several inch-thick groups of pages. The camera scans the *Portland Evening New*s' banner with its momentous front-page headline: "Amelia Earhart's Plane Crashes." The technician observes, "If you wait too long you may get to your shelves and find that the acid process has burned your newspapers and they've deteriorated so bad that the pages cannot be turned. At this point [the newspapers] are not able to be filmed. As you can tell from the color of the newspaper, they're turning brown and they are highly acidic; they're burning up." This bit of hyperbole is contradicted by the camera's resolute documentation—the fifty-year-old pages are pristine, their slightly yellowed borders framing crisp, white pages. But, as far as we know, the 'crisis' is on. The volume is 'infected' and needs immediate microfilming if it is to be saved.

The technician puts one of the inch-thick sections onto the bed of a nearby guillotine cutter, and rotates the circular metal wheel on top and lowers the iron platen. The old manual clamp clatters audibly as it descends. "It kind of bothers me to guillotine newspaper collections because I know the actual papers are not gonna go back on the shelves," the technician discloses. With the newspaper firmly pinned against the guillotine's iron bed, she clutches the long, metal lever and executes the cut. The sound of dense cellulose crunching is audible as the 30-inch steel blade shears through the volume's firm spine. "But to contain the information on microfilm is the ideal way to preserve the newspapers," she explains, sweeping up amputated book detritus with her hands. Spinning the wheel in the opposite direction she raises the platen, exposing a neat stack of antique newsprint now reduced to single sheets. The scene shifts again and we are blinded by the lights of a microfilm camera as the clicking commences. Mr. MacNeil's narrative avoids mentioning the newspaper's fate once it has been filmed and, captivated by the process, most viewers forget to ask, "why did we need to discard the originals?"

This film-and-discard protocol became central to securing national funding for library preservation during the 1980s. The plan hinged on demonstrating how preservation efforts

could be collaborative in addressing this crisis and Congress only needing to provide one-time funding for each work preserved. The solution needed to be accessible nationally and feed into plans to develop a national digital library. With its name reflecting these two imperatives, the Commission on Preservation and Access (CPA) was established in 1986 with Patricia Battin named first president.[2] Having previously served Columbia University as joint Director of Library Services and Vice President for Information Services, Ms. Battin was accustomed to conflating library administration and technology. She saw microfilm as essential to the nascent national strategy because it was an archival storage medium that later could be efficiently scanned.

The actual ability to scan microfilm had to be taken on faith, however, because even during the 1990s a functioning optical scanner for microfilm did not exist.[3] This issue would eventually be resolved through CPA research grants and when it was, "Preserving Access through Preservation" (doublespeak appearing in a 1991 Commission publication) would make redundant the need for original hard copy newspapers; most national preservation planners agreed.[4] Bound newspapers were bulky, required large amounts of shelf space, and after all, they were printed by the million. How could the loss of one volume possibly matter? A last use for preservation microfilming en route to the national digital library envisioned by the Library of Congress and the National Digital Library Federation[5] was considered a judicious use of the unwieldy resource.

A few minority voices publicly protested the plan's clearly technocratic bias. Comparisons were made to the overharvesting of the North American passenger pigeon, one of the most plentiful birds on the planet in the nineteenth century, hunted to extinction by 1914. But, breaking ranks with the Commission's program was so strongly discouraged among the library preservation community in the 1980s and '90s it might jeopardize one's career options. Dissenters were reminded that only through one collective voice could Congress be convinced to fund a de facto National Preservation Program to address the crisis.

Microfilming proceeded apace. Over 60,000,000 pages of newspaper were converted to microfilm during the 29 years of the United States Newspaper Program (USNP), a "unique partnership" between the Library of Congress and the National Endowment for the Humanities.[6] And most of the original newsprint used to create the film was discarded. Access to the microfilmed newspapers was available for purchase or though interlibrary loan, so the country's largest libraries moved in lockstep to jettison their gargantuan 'duplicate' paper copies in exchange for svelte editions of microfilm. Surveys to determine the number of surviving original newspapers were never conducted. It turned out some institutions discarded complete sets for microfilmed runs lacking specific issues they once owned in paper. And researchers who actually used the film understood it contained out-of-focus illegible images and missed pages. But replication using the time tested film-and-discard approach was the national directive. After filming, most experts agreed the newspapers themselves were simply "impractical" to retain, a bias that still prevails with U.S. digital projects today.

Following Library of Congress

Library of Congress's predilection to film and discard American newspapers was a documented reality long before *Slow Fires*. The illustrated *Library of Congress: A Picture Story of the World's Largest Library* published in 1966 detailed in a caption that, "Because single sheets are reproduced more quickly and accurately than bound pages, this bindery

employee is taking apart newspaper volumes that are to be photographed as part of the Library's program to preserve most of its newspaper files on microfilm."[7] As will become clear, disassembling bound newspapers is irreversible.

The origin of the policy to dispose of original newspapers after filming them can be traced to the formidable Luther Evans—who would become the tenth Librarian of Congress in 1945, and eventually director-general of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Describing his pioneering methodology for microfilming the Library of Congress's run of the *Washington Evening Star* in 1941, Mr. Evans said, "The entire back of the binding was sheared off under a power cutter and the pages photographed individually." He went on to summarize his novel method as "the ideal technique for microfilming bound newspapers,"8 because of its great efficiency. Summarizing the impact of this radical departure from traditional non-damaging microfilming some years later, S. Branson Marley, Jr., then chief of the Library of Congress's Serial Division, explained, "This was a major decision, for it meant that in order to film a file for preservation, it was necessary to destroy it; once the volumes were cut for this purpose it was impractical, and usually impossible, to restore them."[9] This policy would affect the nation because the Library of Congress 1) lead the nation's preservation program by example, and 2) as advisor to NEH, strongly influenced funding; grants that did not employ Luther Evans' strategy were not deemed competitive.

A tightly bound newspaper provides significant safeguards for its contents and protects the paper from physical damage and oxidation except where the exposed edges contact the air. Like any serial, the binding is added once the series is completed and because a newspaper is oversized, its binding requires copious amounts of hand labor. Bound newspapers typically required hand sewing rather then oversewing because of machine limitations, and were usually sewn through the fold or overcast with tiny, meticulous stitches. Once the spine is glued up these sewing structures exert minimal stress on the paper and permit the book's massive sheets to open and be turned easily. A fact known to book conservators but lost on the efficiency-oriented microfilming staff is while bound newspapers printed on acidic, unpurified groundwood grow more fragile with age, most remain flexible—usable—if the pages are carefully handled.

In essence, a newspaper's binding does far more over time to protect its contents than one might suspect. Compressing the paper minimizes its exposure to air, light, and changes in environmental conditions, thus aiding in its preservation. Once guillotined for microfilming, however, a vintage newspaper's fragility cannot tolerate the stress of being resewn. Disbound, the newsprint becomes as vulnerable as a snail without its shell, its loose single sheets far more susceptible to tearing form random physical contact.

The principle that allows many bound newspapers to continue functioning even as the chemically weakened pages age is similar to the reason a fakir can lie unharmed on a bed of nails. Distributing a body's weight evenly over a broad surface prevents pressure from an individual nail from puncturing the skin. If individual issues of a newspaper are sewn into a volume when it's in its physical prime the paper easily tolerates the torque exerted by taut thread. But as paper loses physical strength due to acid hydrolysis and oxidation, re-sewing becomes difficult if not impossible. While individual leaves of deteriorated newspapers are easily torn, collectively even a very fragile volume often remains relatively sound and intact. Damage most frequently occurs to the pages at the front and the back of the book—the places

where stresses most closely resemble the single nail—while the book's entire dense interior often remains remarkably unharmed.

Non-damaging microfilming of bound newspapers has been a viable technical option since the 1930s. Spring-loaded cradles were developed to compensate for the book's varying thickness as its pages are turned and photographed, pressed firmly against a glass plate. This method of handling fragile bound volumes prevents damage from occurring even when filming tight gutter margins and is employed to return the book to the shelf unscathed. Because it adds time and expense to the procedure, however, book cradles are reserved for books with "artifactual value."[10] Within the funding climate of the 1980s and '90s, this generally prohibited its use for historic newspapers in USNP grants and prompted Nancy Gwinn (Director, Smithsonian Institution Libraries), author of the 1987 Association of Research Libraries microfilming guide, to state, "the filming process is often damaging and irreversible."[11] Ms. Gwinn's warning was not concerned with shooting microfilm per se, but rather, with preparing bound newspapers, which she favored doing quickly.

"If you do remove the bindings from bound volumes before filming," Ms. Gwinn advised, "the quality of the film is usually improved, and the cost of producing the film is significantly reduced. The most expedient method is to use a cutting machine, known as a guillotine, for those volumes that are not to be retained."[12] Fiscal constraints inherent in USNP grants predisposed applicants to minimize microfilm production costs. And critically, when the technical advisor to USNP was asked whether it was "necessary, feasible, or appropriate"[13] to retain original newspapers after they were filmed, Library of Congress demonstrated by example that discarding historical newspapers was customary, as Luther Evans had long ago established.

What are Historical Newspapers Good For?

The convenience of accessing digital media should not be confused with the importance of preserving hard copy newspapers.

Like all media, printed newspapers contain visual clues encoded in the media that affect the reader. Michael Golden, Vice Chairman of the New York Times Company, noted, "the transfer of information from a broadsheet printed newspaper is faster than from a news website."[14] Graphic language—the size of a headline, how much space is devoted to the story, whether or not there is a photo (or two), and whether the story occurs above or below the fold—delivers significant evidence obscured in the digital environment. Print resolution is also superior to flickering webpages for reading lengthy stories.

But reader comprehension is not the reason for preserving newspapers in original format. The question for cultural institutions is how will hard copy newspapers be used in the future? The most likely answer is that surviving copies will be seen as primary source material, the authentic exemplar—what natural history museums call 'type specimens.' The erroneous assertion that acidic paper 'is turning to dust' is propagandized exaggeration. Properly housed and carefully handled, bound newspapers can continue serving for millennia in their most important role, what book conservator and educator Gary Frost terms venerable "leaf masters:"[15]

- As backups to regenerate screen copies. This security function will come into play as a result of unanticipated system failure or data loss occurring from unsuccessful archives functions;
- As master copies, to augment, enhance, or correct faulty screen copies. Access to the authentic artifact becomes significant when future researchers discover surrogates are missing pages, lack requisite information such as foldouts, color reproductions, or ads, or abound in technical deficits including poor image resolution; and,
- For authentication, to provide forensic evidence about original production techniques or to verify questions of provenance.[16]

With these archetypal uses in mind, it should be said that newspaper reproductions cannot perform the role of the original. Each technology—printed ink on paper, microfilm, or optical scan—is a distinct medium replete with it its own technological 'fingerprint.' Despite the numerous benefits reproductions can provide—ease of use, mass distribution, compact storage, or chemical stability—not every quality of the original can be replicated in an alternative medium. By definition, preservation microfilm is a black-and-white, silver gelatin photographic process unable to reproduce color images. Among its distinct media characteristics, silver gelatin microfilm is 'colorblind' to rotogravure and four-color process used to print Sunday supplements, magazines and funny pages from the 1890s to the present. Color images 'preserved' on microfilm are simply lost.

Following the Money

Perhaps surprisingly, microfilm's inability to capture data from a medium it was intended to replace was considered an acceptable compromise. CPA president Patricia Battin delimited the national goal to "preservation of the intellectual content rather than the conservation of the individual artifact,"[17] in an attempt to justify this concession and equated the problem with triage on the battlefield. Repeated retelling of this misinformation convinced Congress to act.

Inconveniently, some members of the scholarly community rejected microfilm reproductions as a viable substitute when it came to research with specific nineteenth and twentieth century printed illustrations. So, with support from the Getty Grant Program the Commission appointed a Joint Task Force on Text and Image to study uses of "information" identified as "text-cum-image." After a lengthy review, the Task Force found some text-cum-image works required an alternative to microfilm, a position that diverged from the Commission's standard operating methodology. The Task Force justified this perception by asserting, "the claims of future scholarship must be considered," and further, that although "in many cases," those claims "can only be guessed at, it is at least evident that historians of specific disciplines will always want access to the visual materials of the past."[18] Microfilm, they judged, was implicitly inadequate to capture images when imagery really mattered. The "specific disciplines" identified as requiring this special dispensation included, "anatomy, architecture, art history, cultural history, entomology, geology, history (general), medieval archaeology, and photographic history."[19] Newspapers, despite incorporating all of these disciplines from time to time, are a medium and not a discipline and therefore lacked advocates.

For material the Task Force did deem deserving of an alternative approach, physical conservation was recommended:

- As a hedge against time to await better conservation technologies for material containing text-cum-image;

- In order to return objects to normal use after preservation reformatting;
- Because items are recognized as having intrinsic value for exhibition, teaching, or research.[20]

Easily overlooked in its innocuous middle position, the recommendation to save original material so it could be returned to "normal use" after reformatting was an anomaly, the only time this concept occurred within the Commission's publications. But rather than becoming championed as an integral part of the national preservation strategy, the Task Force relegated conservation to "a service-oriented decision of primarily local interest."[21] In practice, this meant that while some media was clearly impossible to reproduce using silver gelatin microfilm, the problem of conserving original newspapers could not be addressed with federal funding. As mentioned earlier, the rationale behind this thinking was that national monies could only be used to preserve each item once, and conservation implied multiple items in numerous locations might require treatment for local use. Where microfilming increased access and digitization virtually amplified it, conservation merely addressed local use even if the material was unsuitable for microfilming. The cost of conservation had to be borne as a local expense; the national program would only fund duplication even when that did not provide a workable answer.

Between 1982 and 2011 NEH allocated 54.1 million dollars to USNP to microfilm newspapers.[22] With Library of Congress's technical advice the program allocated no money to improve environmental storage conditions for collections or to provide conservation treatment for original objects. Lacking federal assistance for all but fundable "national priorities," [23] basic care of original historical newspapers was seriously hobbled. Paradoxically, microfilm produced in accordance with national preservation recommendations required stringent environmental control to achieve permanence.[24] If achieving permanence for America's original newspapers had been a cherished value, one copy of each could have been stored in the cold, dry, pollutant-free environment mandated for microfilm as an ongoing local cost, and the archetypes saved cooperatively for a fraction of the price the nation paid to microfilm and destroy them.[25]

Did Anybody Notice?

Ellen McCrady, editor of the *Abbey Newsletter*, undeterred by implied threats of retribution, summarized the national approach to preservation in her characteristically plainspoken fashion. "I think they leapt at that solution and oversold it . . . [Commission on Preservation and Access president] Pat Battin was gung ho on microfilming, and to her this was the solution. She used to call it 'preservation.' Microfilming is not preservation. Microfilming is microfilming—it's copying. She was overstating her case."[26] Placing the responsibility for the national agenda squarely at Ms. Battin's feet, Ms. McCrady admonished, "You shouldn't distort reality in order to gain the favor of the masses. It'll backfire."[27]

During the 1980s, other countries approached newspaper preservation with far more custodial sensitivity than the United States. In Canada, for example, provincial libraries comprehensively collected the newspapers from their own province while the Library and Archives Canada (LAC) saved representative examples from each region. Each province microfilmed and sold copies of its newspapers to the LAC to centralize access, but the original newsprint editions remained stored in perpetuity within the region.[28]

The National Library of Austria developed an aqueous process for strengthening deteriorated newsprint that alkalized the paper and reinforced its strength. The process included impregnating historical newsprint with a low-viscosity emulsion of methylcellulose and polyvinyl acetate containing an alkaline (magnesium or calcium) buffer. The treatment was conducted in a vacuum chamber so stacks of sewn newspapers (without their bindings) could be saturated simultaneously. Treated papers were then frozen and freeze-dried to remove the excess moisture. Newspapers with original sewing intact were recased into the original binding, while papers requiring resewing were first hand sewn and then rebound.29

During the same time period, Zentrum für Bucherhaltung (ZFB, Centre for Book Preservation) in Leipzig, Germany, provided commercial mechanical paper splitting combined with aqueous deacidification for research libraries internationally. The newspapers were washed, split, reinforced in the center of the sheet with lens tissue, and the two severed half-sheets reattached with methylcellulose. A binding edge could be added via the leaf casting process to facilitate rebinding at a unit cost roughly comparable to producing a microfilm copy.[30] The technique was so refined it was possible to split fire-damaged newsprint and retain a one-inch charred outer edge so that following treatment the charred edge was as usable as the un-scorched center of the sheet.

The 6,400 volumes of rare, historically significant American nineteenth and twentieth century newspapers author Nicholson Baker purchased at auction from the British Library in 1999[31] represented that nation's "foreign titles." There was never any question about the British Library saving the United Kingdom's original papers, as these are considered national heritage. Patrick Fleming, Head of Operations and Services at the British Library, candidly summarized the issue at a recent IFLA International Newspapers Conference: "We [citizens of the U.K.] would put you [the U.S. preservation community] in jail for what you did to your newspapers."[32]

How is it the U.S. chose to microfilm and discard its national newspaper collections, while no other nation on Earth following suit? An explanation that rings true was proffered by Austrian book conservator Otto Wächter in 1987 who suggested that rather than a technological plague brought about by acidic paper, the problem facing American libraries was actually "a case of 'preservation policy.'"[33]

Preventive Conservation

In 1989, Barclay Ogden managed to summarize a sustainable approach for the U.S. national preservation strategy in a CPA publication that included low-cost alternatives to microfilming, including long-term retention of original material. Director for Library Preservation at University of California, Ogden wrote, "The vast majority of all artifacts could be preserved without treatment and at low cost through preservation measures to reduce their rates of deterioration and wear, thereby extending their lives and minimizing the number of artifacts in need of treatment at any one time."[34]

Now termed preventive conservation, this tactic would have dramatically reduced the rate of chemical deterioration for individual newspapers by storing them in appropriate environmental conditions.[35] Use of custom-fitting protective housing made from alkaline paperboard or chemically inert plastics would have provided important physical protection as well as a microenvironment around each volume within the building's gross storage environment. Preventive conservation might also have imposed policies restricting access to original newspapers and encouraging use of reproductions for most research, and imposed

elevated levels of physical care when the fragile originals were handled. Glove use would have been discouraged because handling newspapers with diminished haptic awareness could lead to inadvertent paper damage.[36] And, while ahead of his time in 1989, Mr. Ogden was not alone. Back in 1962, Gordon Williams, director of the Center for Research Libraries, proposed—in a report funded by the Council on Library Resources, the precursor to the CPA—a "centralized, preservation agency" where one copy of every significant book in the U.S. could be housed in cold storage and microfilming on demand to provide access.[37]

Yet even today, NEH remains staunchly committed to the philosophy that a newspaper's microfilmed surrogate somehow transubstantiates into the object of record. For example, if a microfilm copy of a newspaper is available it must be used in NEH-funded digitization projects rather than reshooting the paper from the original broadsheets despite qualitative improvements that might be realized. But scholars are not deceived. John E. Newhagen, associate professor at Philip Merril College of Journalism, University of Maryland observed in 2005, "Logic dictates the simple truth that any facsimile is not the same thing as the physical object it represents, no matter how well rendered." [38] And James Mussell, Department of English, University of Birmingham (UK), recently noted that Mr. Baker's decade-old claim in *Double Fold: Libraries and the Assault on Paper*, "that the vast majority of original American newspapers, from the 1870s on, has been destroyed and replaced by microfilm—appears to be correct."[39] The domestic implications of this tragic loss have yet to be fully comprehended.

But not all original U.S. newspapers were lost. Pockets of historical runs in private hands survived the purge although these are exceedingly rare—possibly unique. Twenty-seven years after Sanders' *Slow Fires* fanned the flames of a U.S. preservation pandemic, the 6,400 American newspaper volumes Mr. Baker purchased with his daughter's college fund, including what may be the last complete run of Joseph Pulitzer's *New York World*, are now deposited in perpetuity at Duke University Libraries and complement their other 10,000 newspaper titles. These papers, covering U.S. labor history, immigrant publications (in multiple languages), and a cross-section of historical papers from Southern States are shelved within Duke's Library Service Center, a 50-degree F., 30-percent relative humidity storage facility designed to warehouse nearly nine-million volumes.[40] And Duke is not an anomaly—University of Utah boasts approximately 10,000 volumes of its state's historic newspapers housed in Coroplast boxes[41] or polyethylene bags on dedicated shelving within the controlled environment of a standalone storage facility. Storing large numbers of rare books is what research libraries traditionally do, and nothing can be more rare today than runs of historic U.S. newspapers.

Conclusion

The process of conferring 'object of record' status on microfilm does not exonerate the misguided participants of the U.S. national preservation program who, in the name of digitization, misgauged the ability of one media to replace another. Only original objects can provide continuity with the past, as Mr. Frost[42] observed, because only the authentic items can serve:

- As backups for regenerating screen copies
- As master copies, for augmenting, enhancing, and correcting faulty screen copies
- For authentication, to verify original production techniques and determine questions of provenance.

Historic newspapers are difficult to collect because they are fragile, oversized, and require considerable storage space. As the newspaper industry itself struggles to survive in the new digital environment it is likely the morgues of many smaller weekly and daily papers will disappear. This provides an immediate opportunity to collect material in private hands spared the first national preservation purge to ensure it is not lost this time around.

Surviving hard copies need to be preserved in appropriate climatic conditions within state and private institutions capable of caring for them in perpetuity. Federal institutions, embracing Luther Evans' folly, abdicated that responsibility and the public trust was shaken. But U. S. research libraries, archives, and historical societies can demonstrate they now have their collection development priorities in order. Throw out the general collection if you must, but save the last remaining copies of your state's historical newspapers. Surely, we will need backups.

References

[1] Sanders, T. *Slow fires: on the preservation of the human record.* Narrated by Robert MacNeil. Santa Monica, Calif.: American Film Foundation, with support from Council on Library Resources and American Film Foundation, 1987. Videocassette (59 min.): sd., col.; 1/2 in.

[2] Council on Library and Information Resources, "History," Retrieved from the World Wide Web 16 July 2014: http://www.clir.org/about/history

[3] Waters, D. J. *From microfilm to digital imagery: on the feasibility of a project to study the means, cost, and benefits of converting large quantities of preserved library materials from microfilm to digital images: a report of the Yale University Library to the Commission on Preservation and Access (*Washington, D.C.: Commission on Preservation and Access, 1991).

[4] Field, J. M., "Chapter 6, building a national preservation program: National Endowment for the Humanities support for preservation," in, *To preserve and protect: the strategic stewardship of cultural resources* (Washington, D.C.: Library of Congress, 2002). Retrieved from the World Wide Web 16 July 2014: http://www.nps.gov/history/history/online_books/presidents/chap6.html

[5] Formally created May 1, 1995, the Digital Library Federation was comprised of twelve academic libraries, New York Public Library, U.S. Library of Congress, U.S. National Archives and Records Administration, and the Commission on Preservation and Access.

[6] United States Newspaper Program, Newspaper and Current Periodical Reading Room, Serial and Government Publications Division, Library of Congress, Retrieved from the World Wide Web 18 July 2014: http://www.loc.gov/rr/news/usnp/usnpp.html

[7] Gurney, G. and Apple, N. P., *The Library of Congress: a picture story of the world's largest library* (New York: Crown Publishers, 1981); revised from the 1966 edition by Gurney G. and Wise, H. F., quoted in Baker, N. *Double Fold*, 25.

[8] Evans, L., "Reference department," in, *Library of Congress, annual report of the Librarian of Congress for the fiscal year ending June 30, 1941* (Washington, D.C.: U.S. Government Printing Office, 1942): 133; quoted in Baker, N. *Double Fold*, 38.

[9] Marley, S. B. Jr., "Newspapers and the Library of Congress," *Library of Congress quarterly journal*, July 1975, 32(3), reprinted in Veaner, A. B. *Studies in micropublishing, 1853-1976: documentary sources*. Westport, Conn.: Microform Review Inc., 1976, 425; quoted in Baker, N. *Double Fold*, 38.

[10] Gwinn, N. E., *Preservation microfilming: a guide for librarians and archivists* (Chicago: American Library Association, 1987): 16.

[11] Gwinn, *Preservation microfilming*, 1987: 36.

[12] Gwinn, *Preservation microfilming*, 1987: 37.

[13] Gwinn, *Preservation microfilming*, 1987: 36.

[14] Golden, M, Vice Chairman, New York Times Company and a member of New York Times' Board of Directors, an email communication to Edward McCain, Digital Curator of Journalism, Donald W. Reynolds Institute, Missouri School of Journalism, sent 19 February 2014. Mr. Golden approved the text quoted in this article.

[15] Rieger, O. Y. *Preservation in the age of large-scale digitization: a white paper*, section 4, Implications of LSDIs for Book Collections (Washington, D.C.: Council on Library and Information Resources, February, 2008), retrieved from the World Wide Web 19 January 2014,

http://www.clir.org/pubs/reports/pub141/reports/pub141/contents.html

[16] Frost, G. *Future of the book: a way forward* (Coralville, IA, n.p., 2012): 23.

[17] Battin, P. *Scholarly resources in art history, issues in preservation: report of the seminar, Spring Hill, Wayzata, Minnesota September 29-October 1, 1988* (Washington, D.C.: Commission on Preservation and Access, 1989): 2.

[18] *Preserving the illustrated text*, 1989: 15.

[19] *Preserving the illustrated text*, 1989: 1.

[20] *Preserving the illustrated text*, 1989: 17.

[21] *Preserving the illustrated text*, 1989: 17.

[22] National Endowment for the Humanities, United States Newspaper Program, retrieved from the World Wide Web 16 January 2014, http://www.neh.gov/us-newspaper-program

[23] Smith, A. *The future of the past: preservation in American research libraries* (Washington, D.C.: Council on Library and Information Resources, April 1999).

[24] Gwinn, N. E., "Microfilm practices and standards," in, *Preservation microfilming: a guide for librarians and archivists* (Chicago: American Library Association, 1987) 96-130.

[25] On the significant benefits derived from improving environmental storage conditions, see: Sebera, D. K. *Isoperms*, 1994. See also: Reilly, J. M., Nishimura, D. W., and Zinn, E., *New tools for preservation: assessing long-term environmental effects on library and archives collections* (Washington, D.C.: Commission on Preservation and Access, 1995); and, Ford, P. *IPI's guide to sustainable preservation practices for managing storage environments* (Rochester, N.Y.: Image Permanence Institute, Rochester Institute of Technology, 2012).

[26] McCrady, E., quoted in Baker, N. *Double fold: libraries and the assault on paper* (New York: Random House, 2001): 206.

[27] McCrady quoted in Baker, 2001: 206.

[28] Turko, K., *Preservation activities in Canada: a unifying theme in a decentralised (sic.) country* (Washington, D.C.: Commission on Preservation and Access, 1996): 7. Retrieved from the World Wide Web 19 January 2014, http://www.clir.org/pubs/reports/pub60/pub60.pdf

[29] Wächter, O., "Paper strengthening at the National Library of Austria," in, Merrily A. Smith, (ed.) *Preservation of library materials: conference held at the National Library of Austria, Vienna, April 7-10, 1986* (München: London: Saur, 1987): 141-151.

[30] Conversation in UT, 1994, with chemist Dr. Manfred Anders, now CEO (Geschäftsführer), ZFB Zentrum für Bucherhaltung GmbH, Leipzig, Germany, http://www.zfb.com/en/home . A recent email from Dr. Anders (31 January 2014) explained the paper splitting machine has not proven economically viable despite its phenomenal capabilities, although hand paper splitting is still offered.

[31] Baker, N. *Double Fold*, 2001: 268.

[32] Public comment made Patrick Fleming, Head of Operations and Services, British Library, in response to a presentation of this paper at the IFLA International Newspapers Conference, Salt Lake City, Utah, 5 February 2014.

[33] Wächter, O., Paper strengthening at the National Library of Austria, 1987: 141.

[34] Ogden, B. *On the preservation of books and documents in original oorm* (Washington, D.C.: Commission on Preservation and Access, October 1989), retrieved from the World Wide Web 19 January 2014, http://www.clir.org/pubs/reports/pub5/ogden.html

[35] "Environmental criteria," National Research Council (U.S.), Committee on Preservation of Historical Records, *Preservation of historical records* (Washington, D.C.: National Academy Press, 1986): 11-32.

[36] Baker, C. and Silverman, R., "Misperceptions about white gloves," *International preservation news 37* (12/2005): 4-9.

[37] Williams, G. R., *The preservation of deteriorating books: an examination of the problem with recommendations for a solution. Report of the ARL Committee on the Preservation of Research Library Materials* ([Washington, D.C.]: Association of Research Libraries, Committee on the Preservation of Research Library Materials, 1964); Williams, G. R., "The preservation of deteriorating books, Part I: An examination of the problem," *Library Journal*, 1966 (January 1): 51-56.

[38] Newhagen, J. E. Above the fold: the value of paper newspapers, in, Carignan, Y. et. al. (eds.). *Who wants yesterday's papers? Essays on the research value of printed materials in the digital age* (Lanham, MD: Scarecrow Press, Inc., 2005): 75.

[39] Mussell, J., *The nineteenth-century press in the digital age* (New York: Palgrave Macmillan, 2012): 64.

[40] Telephone conversation with J. Andrew Armacost, Head of Collection Development and Curator of Collections, Rubenstein Library, Duke University Libraries, 27 January 2014. See: "Unusual collection of American newspapers donated to Duke libraries, *Duke today*, April 23, 2004, retrieved from the World Wide

Web 27 January 2014, https://today.duke.edu/2004/04/newspapers_0404.html. See also, Grand central station: inside Duke's Library Service Center, retrieved from the World Wide Web 28 January 2014, http://blogs.library.duke.edu/magazine/2012/05/grand-central-station-inside-dukes-library-service-center/

[41] Shrieve, A. F., Gross, V., Hunt, J., Nakashima, T., and Silverman, R. "Boxing the 'big huge': a preventive conservation conundrum," *International preservation news* 57 (08/2012): 31-34.

[42] Frost, G. *Future of the book*, 2012: 23.