

Remote Storage in Research Libraries

A Microhistory

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The storage of eye-readable information at a location removed from its parent institution has a history of more than two thousand years. Despite changes in the kinds of information that are stored and the technologies that enable their storage, the relationship between a reader's time and the distance of material from the reader is a constant challenge to information providers. Competing visions of service and economics, to which remote storage is one response, are timeless.

This short essay on the history of library storage is written at a time when the physical management of research collections relies increasingly on the use of remote facilities to house paper materials. In it, I cover two millennia, hardly pausing to document but pretending to identify a series of trends: the long-lived tension between recorded scholarship and physical space; tradeoffs between physical ownership, access, and physical space; and the changing solutions applied to these problems by many generations of librarians.

The story begins in antiquity. It is written that Socrates worried about the corrupting influence of books on learning (Plato 1955). In his age—the sixth century B.C.—knowledge traveled by word-of-mouth, and though scrolls and codices existed, Socrates was convinced that scholars would never use them. If only we had listened. The fixing of texts in papyrus, animal skins, or paper, embodied ideas, or in Negroponte's postmodern phrasing, turned them atomic (Negroponte 1995). Whatever the terminology, however, the newly embodied ideas in their physical form required space and thus began the quest for finite library space, now well into its second millennium.

Three centuries after Socrates's lament, the acquisitions rates at Alexandria, the world's first comprehensive research library, began to threaten its storage capacity. A document dating from 257 B.C. shows that the library received 434 papyrus scrolls in 33 days (Manguel 1996). And, yes, the Alexandrian Library developed a remote storage facility. Several sources cite a depository of 48,000 duplicate scrolls from the library housed in the Temple of Serapeum, located in the Egyptian quarter of the city (Millares Carlo 1993; Brundige n.d.). The hubris of a quest for acquiring universal knowledge has, from Alexandria forward, produced the nemesis of space crisis. At Alexandria, bibliographic overcrowding was "relieved" not by building but by the destruction of the scrolls and papyri by the conquering Turkish emperor whose intent it was to rid the empire of Greek and Roman influences. The collapse of classic civilization, the loss of its recorded knowledge, and the continuing preservation of knowledge that in monastic retreat had only small numbers of scrolls, postponed the next age of monumental knowledge building in the West for a millennium.

Beginning with Gutenberg, five major landmarks in knowledge building are fixed in early modern Europe (see figure 1). Gutenberg's work in printing

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changed “publication” from high art to heavy industry. While printing itself followed a very conservative trajectory—using Gothic type faces and preserving manuscript layout, with margins for annotation, for instance—readers and librarians took a more radical view of what the technology implied. Newly literate men and women quickly grasped the advantages of printed books and often replaced manuscript copies of the same work in their collections (Lerner 1998). Apparently, university libraries practiced this same substitution and even sold the items they deaccessioned to make bindings for the newly printed books. Though paper cannot yet be recycled to silicon, the rest of this transition sounds very familiar in our era of shift from printed to digital storage.

Nicholas V, Pope from 1447 to 1455 and a liberal patron of the arts, unified several Vatican collections into a single repository during his papacy. This consolidation of resources, and subsequent assembly of comprehensive collections to foster research and statecraft found like-minded advocates. Philip II of Spain armed his Escorial residence with a huge, imperial library. Henry IV established the Bibliothèque Nationale in Paris and in England Mr. Bodley's library became a feature of Oxford University (Harris 1995). Agustín Millares Carlo points to the Ordonnance de Montpellier, where Frances I issued a decree intended to gather a copy of all works published in France at the Royal Library, as the first national deposit law. The Ordonnance also legislated an early approval plan by stipulating that a copy of every book imported to France be offered to the Royal Library for purchase (Millares Carlo 1993).

In the New World

Harvard University established its library in 1636 in support of teaching and set out to acquire all the books it could. As Harvard is still often the center of intellectual life, two centuries of collection development history in North America culminated in a debate between two Harvard administrators. So important was this debate that students of library history and of remote storage cite this as a seminal framing of the issues. Eliot (1902, 55), the university president, addressed the need for additional storage of library books

with this proposal: “I am not proposing a crematorium for dead books, but only a receiving-tomb. Neither am I proposing that the bibliophile or the antiquarian should be absolutely deprived of his idols, but only that his access to them should made somewhat less convenient and attractive.” Lane (1903, 11), the university librarian, took another view: “The point to be carefully considered is, how will the books thus set aside be treated; how will their segregation affect the interests of scholars; to what degree are they still to be accessible?”

Preserved on the pages of *Library Journal*, these statements set a tone that resonates a century later. The writers' views on the issue of handling expanding library collections led to very different proposed solutions. Eliot's logic and perhaps his position as the president of the pre-eminent university in the country led him to suggest the creation of four storage facilities to serve the entire United States while the library director's vision was less sweeping. Lane proposed a regional cooperative repository to be operated by Harvard, the Boston Athenaeum, the Massachusetts State Library, and other libraries in New England (Line 1980). As a historical footnote, this particular controversy eventually ended with Eliot's retirement in 1909 and the completion of Widener Library in 1915 with shelving capacity well beyond the extant collections. Nonetheless, the basic issues of the debate on storage facilities, which revolve around the economics versus service, a lack of agreement on what predicts use and on the proper locus of cooperation, remained and remain unresolved.

Although I cannot fully articulate it, it seems that there is or might be a relationship between the convergence and divergence of acquisitions rates and construction costs, similar conceptually to the supply and demand curves of classical economics, that drives the intensity of discourse and action on remote storage. Periods of great prosperity such as occurred in the 1920s and 1960s in this country and during the oil-boom in some regions of Latin America and the Middle East, make monumental construction relatively cheap. Hard economic times reduce the prospects for both construction and collections, but between prosperity and depression lie long periods when acquisitions outstrip available storage space. Many factors play into the equation, including the sending of books by countries usually in the

Gutenberg (1450)			National Library of France (1595)
Vatican Library (1455)	Ordonnance de Montpellier (1537)	El Escorial (1565)	Bodleian (1598)
1450	1500	1550	1600

Figure 1. Steps on the Road to Bibliographic Overcrowding in Early Modern Europe

Third World in payment of dollars owed to the U.S., which in the 1960s added books by the hundreds of thousands to U.S. research libraries. This is where the First World has been since the 1970s and where it seems likely to remain for the foreseeable future.

Remote Storage in Modern Years

The second time line fixes six events in the last fifty years of remote storage (figure 2). The New England Depository, which opened in the unlikely year of 1942, conformed to Lane's vision from forty years before: a cooperative, regional facility. A similar approach took shape at the Midwest Inter-Library Center (MILC), which began in 1949 and subsequently in 1965 became the Center for Research Libraries, with storage shared originally by thirteen research libraries in Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Ohio, and Wisconsin (Center for Research Libraries 2000). The British Library Lending Division (1973) illustrates another vision with the assembly of a collection in a single location intended as a nation-wide lending resource.

By the 1980s, many research library collections had surpassed the capacities built to hold them a mere two decades before. Some of the shortfall was met with new construction, at the University of North Carolina, Boston College, the University of Texas at El Paso, and Queens College, for example. However, the building of these library facilities proved exceptional. The preferred solution became high-density storage units located at some remove from the institutions they served. The Harvard Depository pioneered the construction of specifically designed library storage facilities. In the early 1980s, the Northern California Regional Facility and a similar facility begun four years later in Los Angeles served as models in which state appropriations purchased existing space and new furnishings for the holdings of several University of California libraries. The University of Michigan bought and retrofitted a former manufacturing plant, which functions now as the Buhr Shelving Facility for collection storage. Collectively, they illustrate the diverse

storage solutions applied in the last several decades in the United States.

Research on Storing Books and Journals

The late 1970s and 1980s also produced a wave of storage research published in the library literature. The Association of Research Libraries compiled SPEC kits on the topic in 1977 and 1990 that serve as good benchmarks. O'Connor (1994) summarizes much of the periodical and monographic literature. Given the number of different solutions shown on the time line, it should come as no surprise that the authors of these studies do not agree on the most effective solution to bibliographic overcrowding.

Two major positions order the debate. There is first a Metcalf School reflecting the views of longtime New York Public and renowned Harvard librarian Keyes Metcalf. Reified in the many editions of his *Planning Academic and Research Library Buildings*, supporters of the Metcalf School espouse the virtues of a regional, cooperative scheme. Proponents stress that remote storage is best viewed as part of a program that reduces interlibrary duplication and fosters cooperative collection development. Swain (1978) describes the planning of the Northern California facility and Buckland's (1990) proposal of a "last copy" scheme with transparent ownership as the purpose of cooperative storage both develop facets of Metcalf's approach.

The Fussler School represents the views of Fussler (1969), a highly respected figure in library history who postulated that the cost of housing a large collection would be lower if some of it is in compact storage, a premise that follows the economic approach championed by Harvard President Eliot. Although his conclusions and analysis are directly contradicted by Harrar (1962), Fussler's approach holds sway in current library practice. An interesting corollary was developed by Cooper and Gorman, who each ask where the compact storage should be. Cooper (1989) compared storage alternatives and concluded that, with the exception of never-circulating material, greatest savings

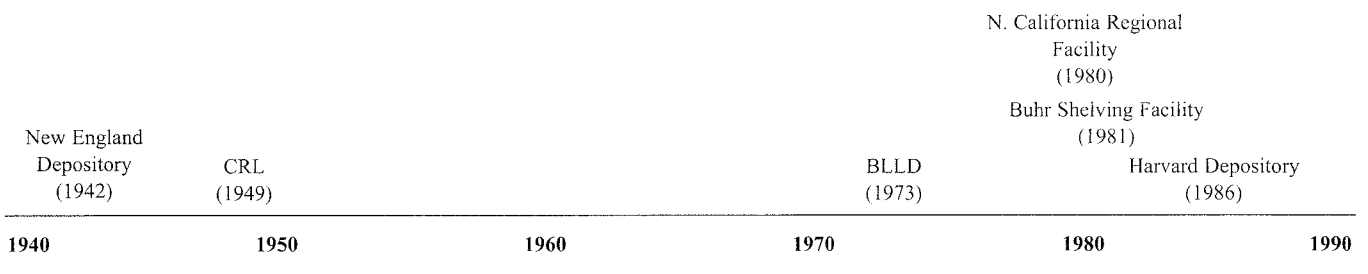


Figure 2. Major Events in the Modern History of Remote Storage

occur when compact storage is open stack and on-campus. Although he wrote two years earlier, Gorman (1987) likewise stressed that moveable on-site compact storage is optimal, principally because selection will never produce a noncirculating collection.

Despite the variety of solutions to space shortages proposed in the 1980s literature, the practice in the 1990s clearly favors the approach illustrated by the Harvard Depository. In 1986 Harvard completed a high-density, modular facility built on land sufficient to hold multiple modules, of which there are three modules currently existing at the Southborough site. Its design, well described on its Web site (Harvard Depository 1999), features climate control, sodium vapor lighting, high bay adjustable shelving, and an inventory tracking system.

The documentation for these new facilities and the thinking that produced them is generally not in the commercially published and indexed library literature, but rather available on the World Wide Web. Searches on Internet search engines that combine terms such as "remote storage," "library materials," and "high density," summon a broad array of library documents, institutional trustee minutes and press releases. These descriptions include a number of interesting facts. Remote storage is likely to occur on any and every campus. In what is surely an unusual case, Williams College has six science libraries and three off-site depositories holding back runs of science journals. Book storage appears in unexpected physical locations. Rice University, for example, has a depository under its football stadium in space shared with the University's Marching Owl Band. And an ever-larger percentage of library collections are housed in remote storage. Colorado State reports that 500,000 (33%) of its 1.5 million volumes are in storage, which is double the percentage of the Harvard University Library collections in storage. In addition to the wealth of specific information on the existence, locations, and relative capacity of these facilities, these texts show an important, public facet of current off-site storage in discussions of how remote storage facilities are described by those who design and manage them.

Still, a Lack of Enthusiasm for Remote Storage

The rationale for storage facilities is uniformly economic necessity. Given current costs and budgetary realities, off-site, high-density storage seems the only viable alternative to a mass deaccessioning of books and journals. But this is clearly a painful choice and one unhappily made. In an interview in *The Chronicle of Higher Education*, Mosher reflects on the difficulties that remote storage caused him as a Medieval Studies doctoral student. Now the library direc-

tor at the University of Pennsylvania, Mosher sees off-campus storage as a necessity, stating that (Young 1998, A27): "All our libraries are full. Something had to be done."

A reluctance to undertake remote storage in the first place finds reflection in public justification. Some of us cite the addition of public space, "seats" in the argot, as a virtuous byproduct of removing materials; gone is the argument once made that a smaller collection is an easier-to-use collection. The importance of environmental upgrades finds expression from the details of "very-flat" construction and temperature and relative humidity statistics to less technical assertions that the facilities will simply prolong the life of books. And, of course, off-site storage is much cheaper; Yale calculates it as one-tenth as expensive as traditional, on-campus, open-stacks facilities. But these assertions lack the enthusiasm so evident in the description of other contemporary initiatives, such as networked electronic resources.

Conceptual and political problems, inherent in remote storage, also emerge from the public documents. Variations on the theme of "if you can take them off campus, why keep them at all," haunt our writing. Ohio addresses this dilemma with the statement that its depositories contain "permanently held but little used library materials." Texas is more forceful, describing its off-campus storage as "a facility for planned remote storage of permanent, *important* [my italics], but little used library materials."

What will go into storage vexes us as well. The mantra, "little-used materials," is both incomplete and misleading. Proponents of the Fussler School argue that "little" should be as close to "non" as possible, but philosophy and internal politics often lead to caveats promising "flexibility in returning material to campus," quoting the Yale documents. Library users, especially faculty members, raise the crucial issue of how removal of material will affect research. Some of the public documents mention an active faculty involvement in the actual selection of materials, before they are transferred. However, the imperatives of a massive move limit faculty involvement to consultation at the planning stage; for example, Cornell is currently transferring 2,000 volumes a day, making faculty involvement difficult.

Operational Assumptions

Librarians have not resolved all the issues that off-site storage raises, but they have come to share a series of basic assumptions on how the new facilities will operate. One prerequisite for including an item in high-density storage is to have it represented in a library's bibliographic database. Not to do so is to consign it to oblivion, but providing an electronic bibliographic surrogate enables readers to browse holdings virtually at a computer screen. It also offers the potential of enhancing access through electronic wizardry

such as linking bibliographic records for these materials to electronic representations of their tables of contents. Librarians also agree on a rapid delivery of materials from storage as essential for establishing remote facilities. Twenty-four hours to two or three days appear in the new facilities descriptions, and several documents mention transmission of articles by fax or Ariel.

Ironically, these developments potentially alter the relationship between distance and access and threaten to overturn the intent of placing materials thought to be little-needed in the less desirable physical location. However, the combination of bibliographic representation of every item in remote storage in online databases (which occurs at a time in large research libraries when significant segments of centrally-housed collections are not yet shown in such databases) with the provision of delivery services that place materials in readers' hands more quickly than the current system of open stacks and self service may provide better access to materials than was possible before. Materials stored remotely may become more accessible and more used, a danger signaled by Gorman (1987), although it is very difficult to argue against promoting greater use of any library materials.

Surprisingly, current research and position papers gloss over two major issues. The first is a lack of agreement on a set of best practices for off-site storage. Not only is the research from the 1980s highly contradictory, but working groups such as the ad hoc storage consortium in the New York metropolitan area have produced widely-divergent analyses and recommendations for action (Final report of the working group 1996; Young 1999). Neither do researchers offer meaningful guidance on the complex issue of selection of materials for storage, although the use of circulation data is generally regarded at least as an initial element in examining and determining what materials should be stored. Second, authors leave unfilled our expectation of analysis of the role of new technologies and how they would affect the facilities of today. Despite the growing presence of JSTOR, a program conceived with space savings at its heart (Bowen 1996), public documents that describe remote storage make digital technology conspicuous as a strategy only through its absence. For now, library planners imply that paper collections will continue to grow substantially and that more of them will reside at remote locations.

Conclusion

I turn readers' attentions to the work of Jorge Luis Borges, an Argentine writer whose involvement in the literary world of authors, book lovers, and readers led to an understanding of libraries. Writing of an infinite "Library of Babel," Borges describes two types of intruders. The first are inquisitors

who are always on the alert for material that offends orthodox sensibilities. But a danger at least as great was seen in another group. "Other men, inversely, thought that the primary task was to eliminate useless works. They would invade the hexagons [Borges' library shelves], exhibiting credentials which were not always false, skim through a volume with annoyance, and then condemn entire bookshelves to destruction." (Borges 1962, 84–85).

In 1999, the year of Borges's centennial, librarians clearly recognize space as a resource as precious as capital and staff yet the commodification of space is not a development of the Information Age. In fact, the inability of library facilities to keep pace with the simultaneous acquisition and preservation of information has challenged our professional ancestors for centuries, and remote storage has been used to house collections for more than 2,000 years. The essence of the Eliot-Lane debate on where and how materials are stored will continue unresolved as long as eye-readable media remain important information carriers. While only incipient in the debate, the role of digital technology in information storage and retrieval promises to change the landscape significantly. How long buildings will remain the principal repository of information is no trivial question. Librarians do not wish to fall behind the technological curve, to be cast in the role of Borges's second class of intruders, nor to be seen as poor stewards of the public's property and cultural heritage. If history offers any guidance here, it is that economy and service exist in competition. Low-cost real estate and high-density shelving will be economical only to the degree that they enable the delivery of information to those who use it.

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