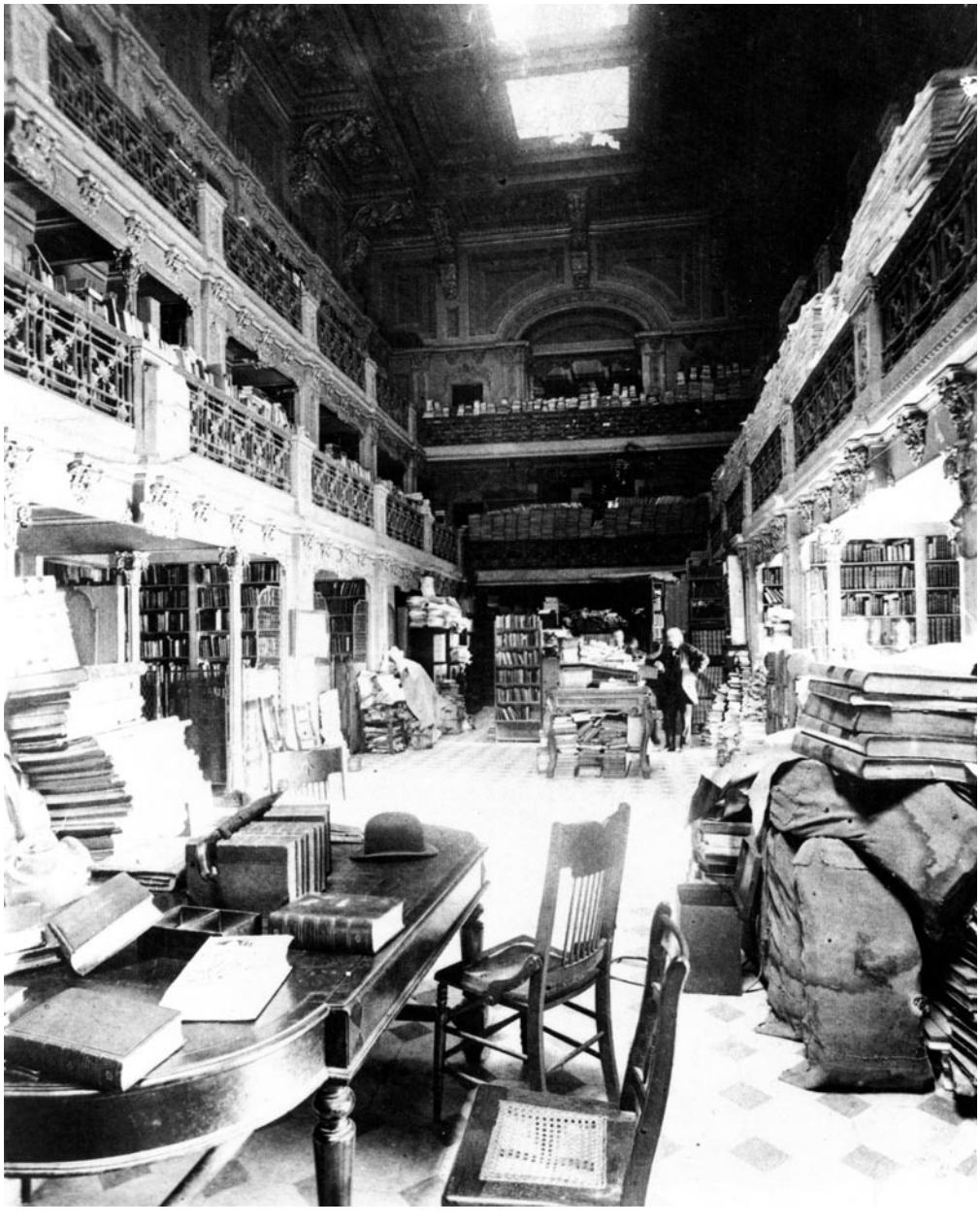
The old Library of Congress in the Capitol building. Library of Congress, Prints and Photographs Division, LC-DIG-npcc-00203.



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Stacks, Shelves, and the Law: Restructuring the Library of Congress

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On January 10, 1876, Ainsworth Rand Spofford, the chief librarian of the congressional library located in the Capitol building at the time, complained in a report presented to a United States Congressional Joint Committee that his job had been reduced to "presiding over the greatest chaos in America."[1] By Spofford's account, the situation in the Library of Congress was dire:

> This is the fourth year in which the necessity for providing additional room for the rapidly growing stores of this Library has been urged upon the attention of the Congress. During that time 60,000 volumes have been added to the collection. The two wings which were built in 1866, and which absorb all the space within the Capitol which could be annexed to the Library, have been more than filled. The temporary expedients of placing books in double rows upon shelves, and of introducing hundreds of wooden cases of shelving to contain the overflow of the alcoves have been exhausted, and the books are now, from sheer force of necessity, being piled upon the floors in all direction.[2]

Nor was the problem limited to books: the floor was also littered with maps, pamphlets, newspapers, engravings, and musical scores, among other things. Images of the old Library of Congress, which had been rebuilt in 1853 after a fire, confirm Spofford's account. The atrium used as the reading room appears to be full of piles of mailbags and mountains of unsorted printed matter; the alcoves built in the three-story gallery around the atrium to accommodate the collection seem woefully insufficient for the task. In reality, however, it was none other than Spofford who had brought this chaos on the Library of Congress. Right after the end of the Civil War, in a frenzy of consolidation, Spofford had spearheaded the move of 40,000 volumes from the Smithsonian into the congressional library as the first step in an ambitious plan to transform the modest library initially established to serve the members of the Congress into one rivaling national libraries in Europe.[3] Commentators noted with

embarrassment in 1888 that Spofford's efforts were still far off the mark: whereas the Library of the British Museum in London had 1.5 million volumes and the Bibliothèque Nationale in Paris had 2.3 million, the Library of Congress had a mere 400,000 volumes, all of which now seemed to be scattered in piles in the Capitol.[4]

Spofford's overzealous project to expand the library's collections, however, was not the only reason for this mess. By the end of the nineteenth century, newspapers were flourishing thanks to the U.S. Postal Service, which distributed them at heavily discounted rates; a fast-growing publishing industry produced material for an increasingly more literate public; and the widespread use of the rotary press made it possible to print more material than ever before.[5] The more immediate reason for the inundation of the Library of Congress with paper, however, was a legal change for which Spofford himself was partially responsible. In 1870—that is, a mere six years before the report—Spofford had successfully convinced the Congress to pass a law making it mandatory for any author requesting to copyright a work to deposit two copies at the Library of Congress. In 1871 alone, the library had received 19,826 items.[6] No wonder that its every nook and cranny was now filled with paper.

The U.S. Copyright Act of 1870 was part of a long and complicated history that unfolded on both sides of the Atlantic Ocean. Legal historians usually trace the emergence of the idea of protecting authorship to the moment when texts became mechanically reproducible in the early modern period, thus allowing authors to transfer to others their economic right to publish and sell their works.[7] Intellectual property, it turns out, was a strange kind of property.[8] On the one hand, because of the demands of a growing market for reading material, it was sold and bought (as well as pirated) with increasing frequency. On the other hand, thinkers such as John Locke insisted that, as the immediate product of one's mind, intellectual property was an inalienable possession.[9] Legal measures were devised from the seventeenth century onward in an attempt to resolve this paradox. For example, the Statute of Anne, passed by the British Parliament in 1710, imposed fines and penalties for "printing, reprinting, and publishing books without the consent of authors and proprietors" but limited the proprietorship of the "learned men" who wrote those books to twenty-one years.[10]

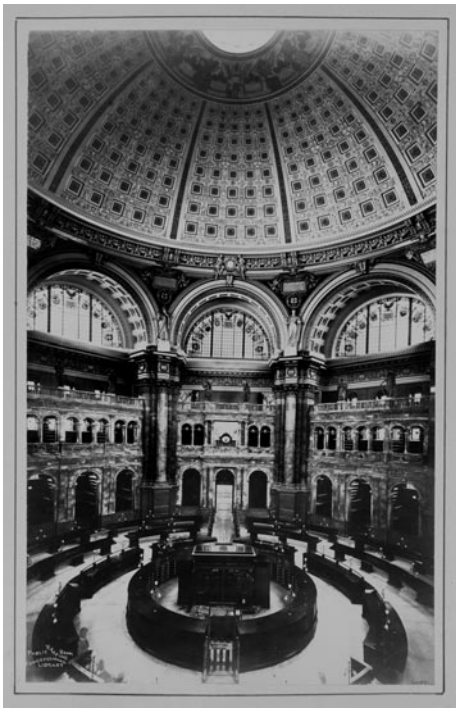
The U.S. Constitution included a clause that the Congress "have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." And yet, as Senator Jonathan Chace observed in 1888, the nineteenth-century United States was the "Barbary Coast of literature."[11] More often than

not, works that had originally been published in English across the ocean were reproduced, altered, and sold in the American market without the permission of their authors or publishers. Even though this was frequently justified as an enlightened republican policy that resisted Old World monopolies, historians have demonstrated that the willful disregard for intellectual property in the nineteenth century in the United States had more to do with the rise of a lucrative American market for printed matter, a market whose size would soon dwarf that of the British market.[12] Not until the United States started producing best-selling books such as *Uncle Tom's Cabin* (1852)—that is, when royalties promised to flow westward across the Atlantic—did laws regulating intellectual property become enforceable in the United States.[13]

Before 1865, when copyright was made contingent on legal deposit in the United States, various institutions—clerks of the district courts, the Office of the Secretary of State, the Smithsonian Institution, the Patent Office in the Department of Interior, as well as the Library of Congress—were charged with collecting copyrighted works. In 1870, all legal deposits were consolidated in the institutional body of the Library of Congress.[14] In exchange for a small application fee and after depositing two copies of a work in the Library of Congress, an author was granted copyright for a limited number of years. The library would do the paperwork and, in return, receive two free copies of a work as well as the reassurance that its collections were growing in a reliably comprehensive manner. The effect of this simple legal arrangement, however, was profound. As the historian John Y. Cole describes it, the centralization of all copyright matters at the Library of Congress "permanently altered the nature of the copyright business and the nature of the library" alike.[15]

Where did the force of the new copyright law come from? Through what mechanisms did the de jure of intellectual property become de facto in late-nineteenth-century America? Debates on the history of intellectual property have historically been dominated by the so-called personality-based justification. This theory is predicated on the assumption of "self-ownership" or what has sometimes been called "possessive individualism"—that is, the Lockean idea that the individual is the owner of his or her physical and intellectual faculties.[16] According to this theory, the permanence of the category of the individual stabilizes authorship and claims to intellectual sovereignty over the work.[17] In this essay, I join others who have critiqued the naturalization of authorship and the transformation of copyright into an intransigent category in this manner, but I do so by examining the architecture of the new building of the Library of Congress, constructed to the east of the Capitol from 1886 to 1897. I focus on the bookstacks that were constructed at the core of the Beaux-Arts

structure, the catalogues (and catalogues of catalogues) that were built in it soon thereafter, and the shelves and drawers this equipment accommodated—in short, the physical assemblage of equipment that structured the library as what we would today call a database. This architecture did not merely make it possible, in Spofford's words, to "follow out the record of any individual copyright, and thus to trace questions concerning literary property."[18] It also had a transformative effect on authorship: the operations carried out inside the building thanks to this architecture—especially operations carried out by the Government Printing Office and the Card Division—caused intellectual property to function in a new manner in the United States in the twentieth century. In this sense, this is also a story about a little-discussed aspect of databases, an arrangement that is narrowly associated today with the rise of computational technologies: that they are not merely records of the world but have the power to reorganize it.



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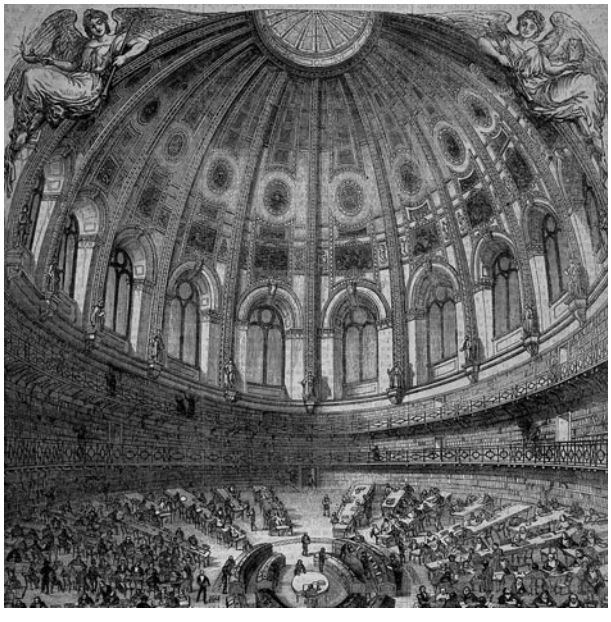
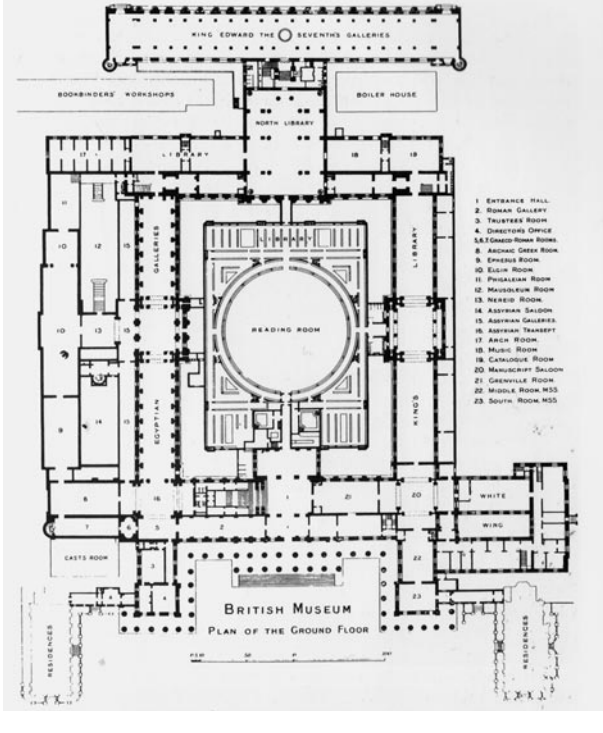
The Beaux-Arts design for what is now called the Thomas Jefferson Building of the Library of Congress was produced by the Washington, DC, architects John L. Smithmeyer and Paul J. Pelz, who, despite having won the architectural competition in 1873, had to wait for thirteen years for the Congress to pass an act authorizing the start of construction. They were ultimately replaced by Edward Pearce Casey, who, along with the Army Corps of Engineers, was credited with

Top: John L. Smithmeyer, Paul J. Pelz, and Edward Pearce Casey. The new Library of Congress (Thomas Jefferson Building), Main Reading Room rotunda, Washington, DC, ca. 1897. Library of Congress, Prints and Photographs Division, LC-DIG-ppmsca-34898.

Bottom: John L. Smithmeyer, Paul J. Pelz, and Edward Pearce Casey. The new Library of Congress (Thomas Jefferson Building), Washington, DC, completed 1897. From Snead and Company Iron Works, *Library Planning: Bookstacks and Shelving* (1908).

the completion of the building ahead of schedule and under budget. The design, implemented after many false starts, had been shaped by the specifications of Spofford, who had in mind the reading room of the Library of the British Museum, with its reference desk in the center and desks radiating from it.[19] For Spofford, this was not simply a matter of aspiring to a well-known model. He argued that a circular plan was the most rational arrangement for a modern library, because it offered an "expansive method" that allowed the building to "grow in all directions, preserving a unity of plan and avoiding those obstructions which split up most great collections into several libraries."[20] This was more fantasy than reality: buildings do not grow like plants, and the repositories of the Library of the British Museum had been fitted awkwardly into the oddly shaped spaces between the circular plan of the reading room and the rectangular plan of the museum.





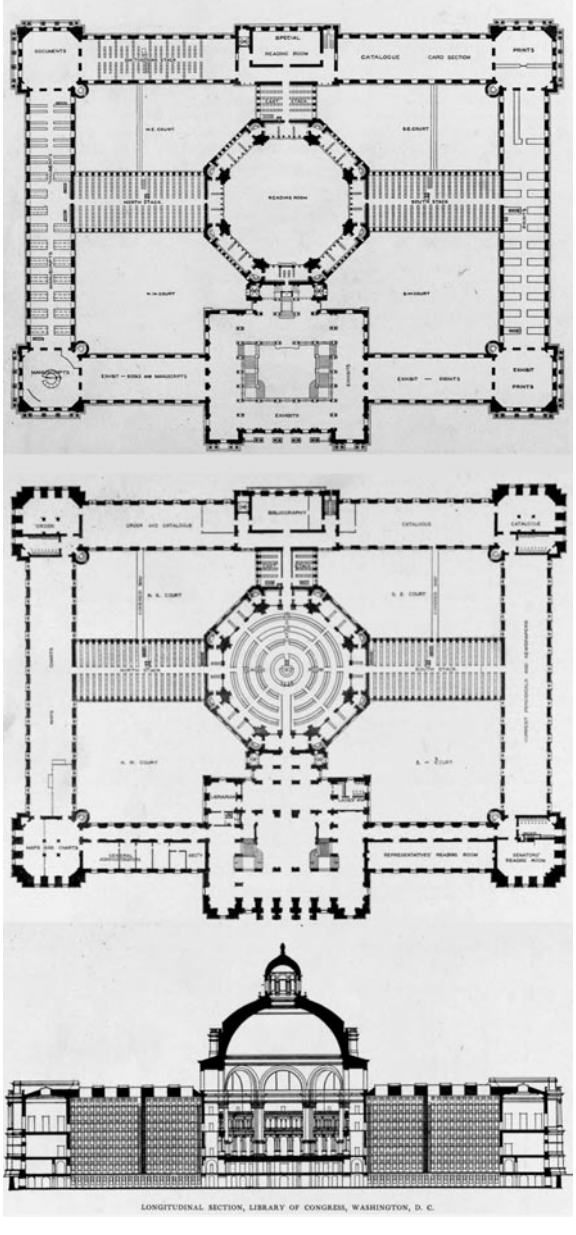
Although the Library of Congress and the Library of the British Museum had similar layouts—centrally planned reading rooms inserted into rectangular plans—the architects of the former turned the spatial logic of the latter inside out. That is, while they followed the circular plan of the Library of the British Museum, they inserted a more efficient linear spatial arrangement within it. The new Library of Congress consisted of four wings arranged around a courtyard, in the middle of which was an octagonal reading room. The desks did not radiate from the center of the octagon but grew concentrically in the manner that Spofford had imagined. Unlike the stacks of the Library of the British Museum, those of the new Library of Congress bridged the main reading room and the east, north, and south wings of the building. These linear rows of shelves would then be extended into the southeast and north-

Top: Sydney Smirke. Main Reading Room, Library of the British Museum, London, 1854. Engraving by G.F. Sargent published in *The London Journal* (1855).

Bottom: Plan of the ground floor of the British Museum in 1930. From *Summary Guide to the Exhibition Galleries of the British Museum*, 14th ed. (1930).

east courtyards of the library in subsequent decades. The concentric logic of the circular reading room was thus hybridized in the Library of Congress with the rectilinear logic of the modern stack.

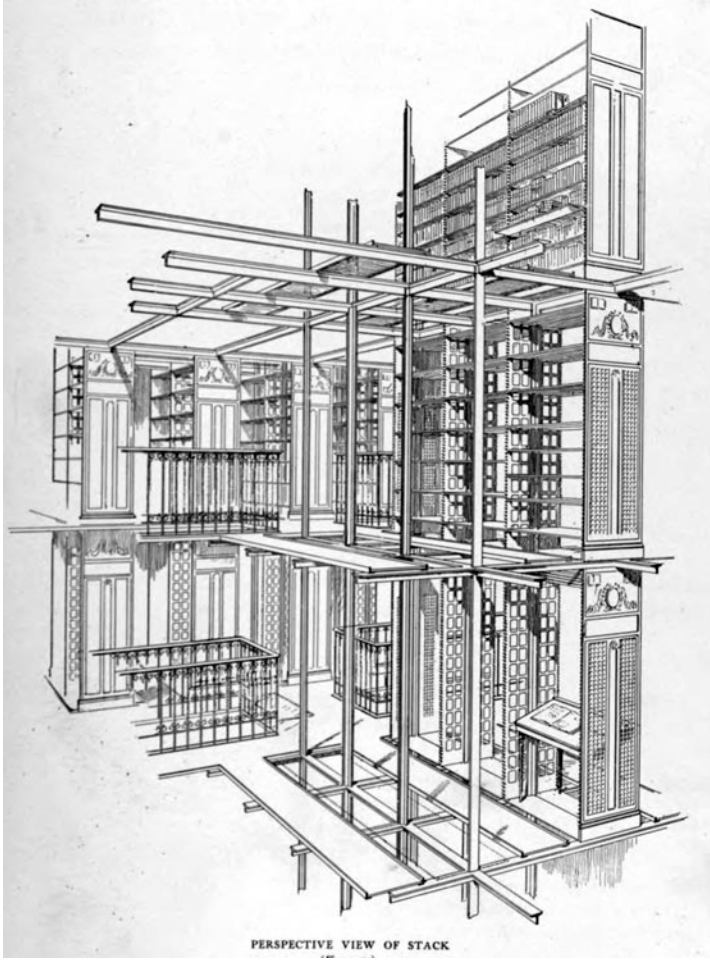
According to contemporary accounts, the stacks constructed by Snead and Company Iron Works were the most important innovation of the new building.[21] Snead and Company patented the design of this "bookstack system" in 1890 and received a gold medal for it at the World's Fair in Chicago in 1893, but not until the construction of the stacks at the Library of Congress did bookstack construction become the company's core business.[22] The ingenuity of the Snead shelves was that, like those of Henri Labrouste's Bibliothèque Sainte-Geneviève in Paris, they were structural—that is, the cases did "not rest on the flooring but the flooring on the general system of the cases."[23] What determined the unit of construction was a system of steel columns that were connected through a horizontal framework of steel beams that also supported thin decks between the tiers of the stacks. While the stacks were ordinarily constructed as a self-supporting system surrounded by masonry walls, when reinforced with diagonal bracing they could be made to be entirely independent of the structure of the building.[24] As Bernard R. Green, the engineer in charge of constructing them, explained, a "true book stack was built within a building" but was "not necessarily any part of it."[25] This meant that in section the floor heights of the building had to be multiples of the tier heights of the stacks so that floors and decks could align occasionally. The Snead stacks went up to ten tiers at Harvard's Widener Library in 1915; to sixteen at Yale in 1930; and to nineteen at Columbia in 1934.[26] Compared to these university libraries, the Library of Congress's stacks were modest: the section was made up of nine tiers, each of which was seven feet tall. Depending on the program, the height of a floor corresponded to two, three, or four times the tier height of the stacks. An elaborate system of lighting,



John L. Smithmeyer, Paul J. Pelz, and Edward Pearce Casey. The first- and second-floor plans and longitudinal section, new Library of Congress (Thomas Jefferson Building), Washington, DC, 1886–1888. Library of Congress, Prints and Photographs Division, ADE Unit 2447.

ventilation, and communication (including pneumatic tubes, and, later, speaking tubes and telephones) was thoroughly integrated into the shelves, thus allowing library staff, as Green provocatively claimed, to operate "bookstacks in the dark."[27] Conveyor belts brought books from up and down the stacks, into the main reading room, and to the Congress via a tunnel. All this was in the name of serving the reader, who was not allowed to go into the stacks but could nonetheless approximate the experience of browsing the collection: the system was reportedly so efficient that it allowed a book to appear at a reader's desk within eight to twelve minutes after being ordered.[28]

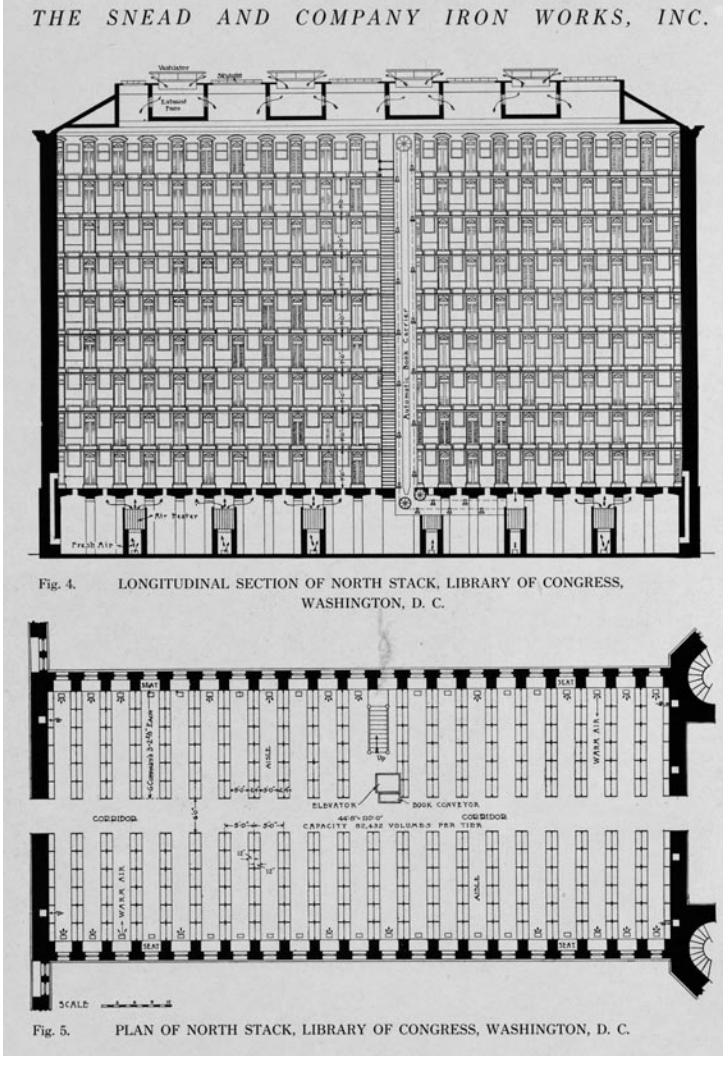
"Built within a building," the stacks of the Library of Congress partially fulfilled Spofford's fantasy of an "expansive" library that grew concentrically—except that the stacks grew in a linear fashion. Green, too, believed that the most significant advantage of the Snead system was its flexibility and capacity for growth. Even though the company did not use the rhetoric of standardization until the 1930s, the elements of the system were designed and constructed to be interchangeable from the outset. Not only did the Snead stacks function as a kit of parts that could be as easily adapted to numerous Carnegie and small college libraries as to monumental libraries such as the Library of Congress, the New York Public Library, and the Widener Library at Harvard, but, according to the company's catalogues, the system also offered an additional adaptability: components from the upper parts could be swapped with those from a lower part despite the fact that the latter had to carry more load.[29] This flexibility had enormous implications for those who classified and indexed a collection. In Green's words, because "the adaptability of a properly designed book stack [was] as universal as the possibility of storing any large quantity of books in a classified and accessible arrangement, . . . *location* [was] thus no longer a serious architectural or administrative question."[30] The alcove type, an inheritance of early modern libraries, fixed a book's place in a recessed section of a build-



Snead and Co. Iron Works. Shelf axonometric. From Snead and Company Iron Works, *Library Planning: Bookstacks and Shelving* (1915).

ing.[31] For example, in the old Library of Congress, philosophy books were intended to be accommodated in an alcove designated for them. Even though most libraries had an indexing technique of some sort (usually a catalogue in book format), the erudite reader's mind was meant to serve as the index of the collection: standing in the atrium of the building, this reader could see and comprehend the library in its entirety as a representation of the world. But whereas the alcove library could not deal well with overflow, Snead shelves were ideally designed for it. Because books did not have to have a fixed location in the Snead stacks, they could be moved into other shelves, sections, or floors as needed. This meant that, while the holdings of the library were accommodated by an architecture, they were now independent from it. A library "collection" could thereby be conceived as an autonomous entity that could potentially be separated from its architectural infrastructure, packed, and unpacked somewhere else.

In 1897, the Library of Congress moved from its old location in the Capitol to its newly completed building. Some eight hundred tons of printed matter—787,715 books and 218,340 periodicals—were reportedly transferred over the course of twelve weeks.[32] At the end, however, only 400,000 of those volumes—that is, less than half of the collection—could be made available to readers.[33] And, by all accounts, after the move the library was even messier than it had been in the Capitol building under Spofford's watch. The Snead stacks alone could do little to mitigate the chaos that had motivated Spofford to make a case for a new building. The problem, as the new chief librarian, John Russell Young, delicately put it in his report to the Congress that year, was that the Library of Congress was "a ship without a rudder"—by which he meant that it had no proper catalogue that worked as an index to its collections.[34]



Right: Section and plan of the north stacks at the new Library of Congress (Thomas Jefferson Building), Washington, DC. From Snead and Company Iron Works, *Library Planning: Bookstacks and Shelving* (1908).

Opposite: Deposits in the basement of the new Library of Congress, ca. 1907. Library of Congress, Prints and Photographs Division, LC-F81-3334.

Spofford had professed to be oblivious to the problem of cataloguing, rejecting any attempts to institute "a universal law upon library arrangement" and frequently offering his memory as the ultimate catalogue instead.[35] The earliest catalogues of the Library of Congress, compiled at the turn of the nineteenth century, were divided into classes according to size—folios, octavos, and duodecimos—while entries in each class were numbered in the order the book was accessioned.[36] Once Jefferson's library was purchased in 1815, the collection followed Jefferson's arrangement, which in turn was indebted to Francis Bacon's organization of the faculties: history for memory, poesy for imagination, and philosophy for reason. Librarian after librarian in the course of the nineteenth century tried to fit a sprawling collection into this tripartite structure, which worked no better than the alcoves into which Spofford crammed piles of printed matter in the old congressional library. The catalogue published in 1815 by the Librarian of Congress George Watterston, for example, kept Jefferson's Baconian system intact but revised it by increasing the number of categories from forty to forty-four.[37] Jefferson's organization scheme was maintained even after it became necessary to add modern terms to the subject index—railroads, sports, photography, ping-pong, and cold storage were among the more notorious examples.[38] One particular Librarian of Congress, John S. Meehan, even attempted to restore the forty Jeffersonian classes by trimming Watterston's forty-four.[39]

By the middle of the century, if anything resembling a comprehensive bibliographic database was being compiled in the United States, it was not at the Library of Congress.[40] The catalogue of the library, in fact, was kept as a scrapbook of sorts for a while, an assemblage of cut-and-pasted text held together in a bound volume that expanded over time.[41] In 1864—that is, a few years before the introduction of the Copyright Act—Spofford published the last comprehensive catalogue of the Library of Congress in book format.[42] This last book cata-

logue was "constructed upon the principle that the reader [was] entitled to find all the works upon any topic described under that topic, and by a single reference."[43] Here Spofford outlined a cataloguing strategy that departed from those of his predecessors at the library:

> The purpose of this catalogue is to afford the readiest available key to the books upon every subject which the Library of Congress embraces. It is not its purpose to furnish a bibliographical system, nor to add another to the numerous existing attempts toward the classification of human knowledge. In any such classification, any arrangement except the alphabetical one must, from the nature of the case, be purely *arbitrary*.[44]

Spofford considered attempts to classify all of human knowledge increasingly moot. So, too, was the idea that the library was for learned readers whose presumed mental faculties would align perfectly with the order of the library. The Baconian organization of the library, like countless early modern schemes to classify and organize knowledge, had been a cosmogram of sorts.[45] That is, it treated the library as a *representation* of the human mind—or, for that matter, of the universe—and attempted to apply the principles presumed to be governing the latter into an arrangement of the former. Spofford's alphabetical organization of the collection, like that of many an encyclopedist, was an attempt to sever this relationship of necessity between the order of the cosmos and the order of knowledge.[46] Yet his rants against the Baconian organization of knowledge notwithstanding, Spofford ultimately returned to Watterston's forty-four-chapter system but grouped the chapters into ten major subjects. "Thus, the various divisions in theology, law, and medicine," he wrote, "will be found arranged in subordinate alphabets under those general heads, instead of being scattered throughout the catalogue."[47] In other words, Spofford's system did not so much eliminate Jefferson's Baconian order as hybridize it with pragmatic arrangements.

That the new library might need an index that was something other than a book might have occurred to Spofford had he not been so willfully indifferent to the efforts of such liberal-minded social reformers as Charles A. Cutter, head librarian of the Boston Athenæum, and Melvil Dewey, chief librarian first at Amherst, then at Columbia, and, finally, at the New York State Library in Albany.[48] Both figures played central roles in the founding of the American Library Association at the 1876 Centennial International Exhibition in Philadelphia and saw the emergent field of "library economy" (a discipline that would later be known as "library science") as providing not only a blueprint for organizing books but also for shaping modern society at large.[49] "The time *was* when a

library was very like a museum, and a librarian was a mouser in musty books, and visitors looked with curious eyes at ancient tomes and manuscripts," Dewey wrote in the first issue of the American Library Association's official journal. "The time *is* when a library is a school, and the librarian is in the highest sense a teacher."[50] Such statements announced—more radically than Spofford ever would—the arrival of a different kind of reader: the new library was not for the erudite scholar whose intellectual faculties were projected outward as the structure of the library but rather for "a reader among books" as was "a workman among his tools."[51] The class distinction was crucial here: some would go so far as to describe efforts to build public libraries at the turn of the twentieth century as a "humanitarian" project to educate the working classes and to provide them with the appropriate intellectual means.[52] The new library modernized its subjects not by thrusting them into the past (as was the case with the museum) but rather into the future with instrumental knowledge. For reformers such as Cutter and Dewey, the library was not one modern institution among others; it was the very institution of modernity.

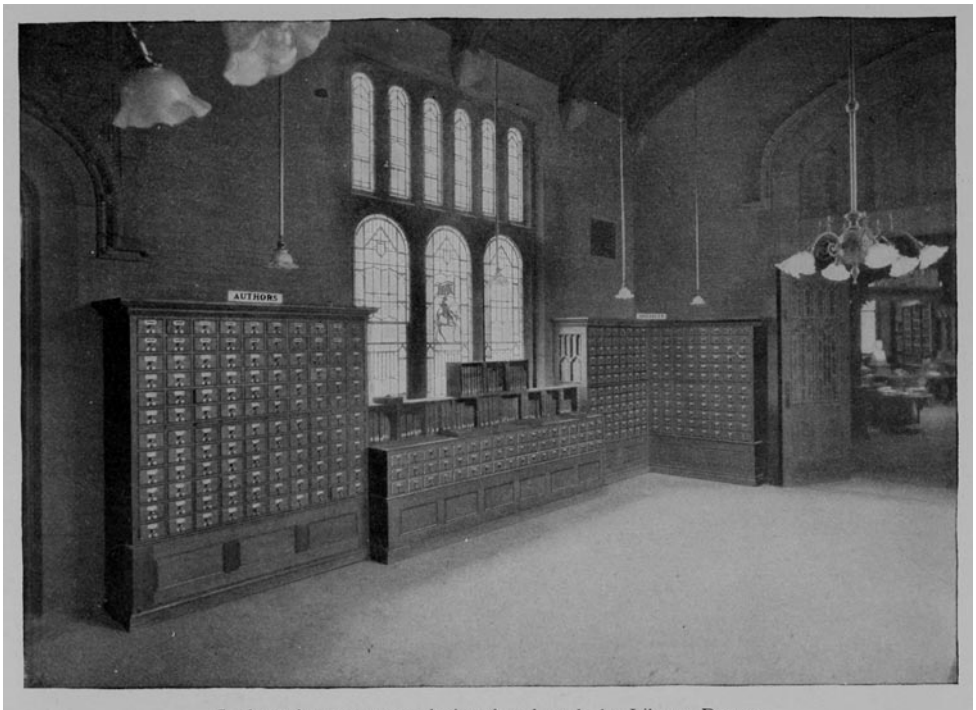
Cutter and Dewey each came up with distinct but ultimately similar systems for organizing their libraries. Dewey's purposefully misspelled "relativ" classification, in provocative opposition to what its inventor saw as the "absolute" classification systems of the past, placed books under a numeral from 0 to 9 denoting subject matter and added decimal points for each subdivision.[53] Cutter's "expansive" classification, which would ultimately transform into the Library of Congress system of classification, distinguished each book first by its subject matter, second by its author, and third by its date.[54] A work on French history, for example, would be found under F 39: "F" for history and "39" for France. Cutter argued that one of the virtues of the system was its flexibility: subject matters and their subdivisions could be expanded as needed and the classification scheme adapted according to the scale of the library.[55] As Markus Krajewski argues, the virtue of these systems was that they could be infinitely varied with the mere addition of an extra letter or numeral.[56] Dewey, like Spofford, understood that the division of the library into nine classes was arbitrary, but, as he saw it, a small amount of "procrustean torture" was necessary for the system to work efficiently.[57] This did not mean, however, that the practical requirements of the library would be sacrificed to "theoretical harmony and exactness."[58]

In a sense, Cutter's "expansive" and Dewey's "relativ" classification systems were the logical complements to Snead's expandable, stackable, and interchangeable bookstacks. A relative classification scheme did not catalogue books according to their assigned place in an alcove or in an idealized circular plan.

Any item was better accommodated by Snead bookstacks since all that mattered was where it was located with respect to its neighbors. This meant that collections became portable entities only partly dependent on their physical architecture. Because Cutter and Dewey's systems kept track of the "relative" as opposed to the "absolute" location of a book, the catalogue did not need to be overhauled when the collection grew over time or when new subdivisions were introduced.[59] Stacks organized according to a relative classification system were as immune to the abstractions of a metaphysical order as they were to the exigencies of the shelves upon which books were placed.

That Dewey would compare his decimal system to "a case of nine pigeonholes" is therefore significant.[60] He was referring to the nineteenth-century office equipment that provided a grid of openings whose function was left purposefully unspecified so that paperwork could be arranged and rearranged in it as needed. Dewey was not simply being metaphorical, however. In 1876, the same year the American Library Association was inaugurated, Dewey founded in Boston a business that supplied specialized equipment—including its own system of bookstacks—to libraries. Making a library catalogue out of slips of paper instead of in bound volumes was a technique that had been employed by bibliophiles since the early modern period. But not until Dewey's company, the Library Bureau, started supplying file cabinets and the corresponding stationery consisting of loose pieces of cardboard did the card catalogue become a fixture of the modern library.[61]

Furthermore, Dewey's Library Bureau facilitated the transfer of organizational technologies from the library to the office at the end of the nineteenth century. Pigeonhole cabinets were made for letters: correspondence would be placed in these cabinets only after being abstracted and folded. The various horizontal and vertical filing technologies that became available on both sides of the Atlantic in the 1860s accommodated not only letters but all kinds of

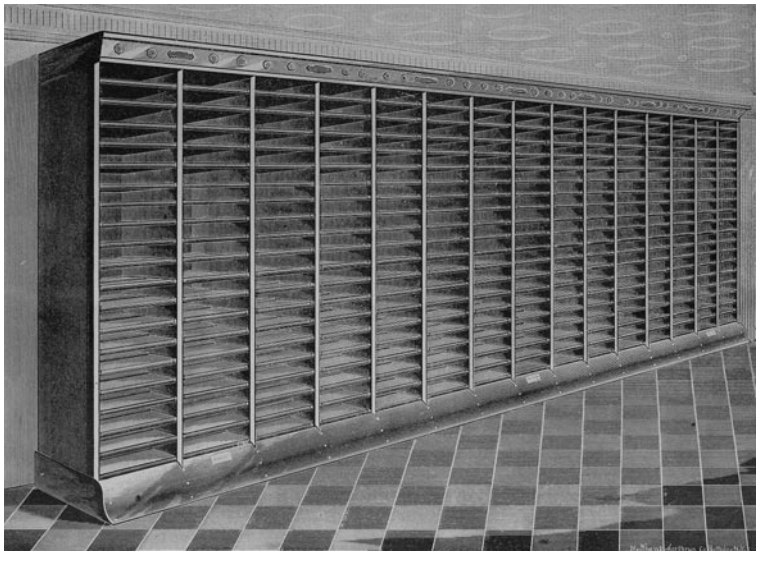


Card catalog tray cases designed and made by Library Bureau.

(unfolded) documents and offered even more opportunities for classification and reclassification.[62] Whereas pigeonhole cabinets offered one level of classification, file cabinets offered many: a section could be subdivided into secondary levels, tertiary levels, and so on—just as Cutter's and Dewey's classification systems could be subdivided with the mere addition of letters or numerals. The Library Bureau was immensely successful. By 1900 it listed among its customers not only libraries but railroad companies, banks, hospitals, factories, and mail-order companies, among many others.

The card catalogue marketed by the Library Bureau was essentially a vertical filing cabinet built for standardized library cards. Even Spofford's alphabetically organized "arbitrary" catalogue, the last catalogue of the Library of Congress in book format, could not sustain change. These catalogues were out of date as soon as they were printed. The card catalogue, by contrast, could be modified with minimal effort. Cards could be added for newly accessioned items, deleted for deaccessioned ones, and rearranged within the file cabinets as needed. Cross-referencing became easier: the same card could simply be copied and placed under different headings—author, subject, title, and so on—in separate file cabinets. "The great feature which has caused librarians the world over to count the card catalog as the greatest library invention," declared the product catalogue of the Library Bureau from 1890, "is the ease of keeping it up to date and in perfect order."[63] A bibliographic database built with cards promised to be never outdated or useless (until it was replaced by an entirely different technology). Under the leadership of George Herbert Putnam (formerly the head of the Boston Public Library), the Library of Congress finally decided to adopt a classification scheme inspired by Cutter's "expansive" system. By the turn of the twentieth century, card catalogues of the kind marketed by the Library Bureau had almost entirely replaced the bound ones in the library's octagonal reading room.

The installation of the card catalogue in the Library of Congress, however, did more than increase the efficiency with which information could be stored and retrieved in the building. Something peculiar happened, especially after the establishment of the Card Division of the Government Printing Office in the basement of the building. Beginning in July 1898, the Card Division, with the help of linotype machines, started printing on standardized cards copies of the entry for each title received by the library's Copyright Office.[64] In the meantime, the office also tried to catch up with the older collections

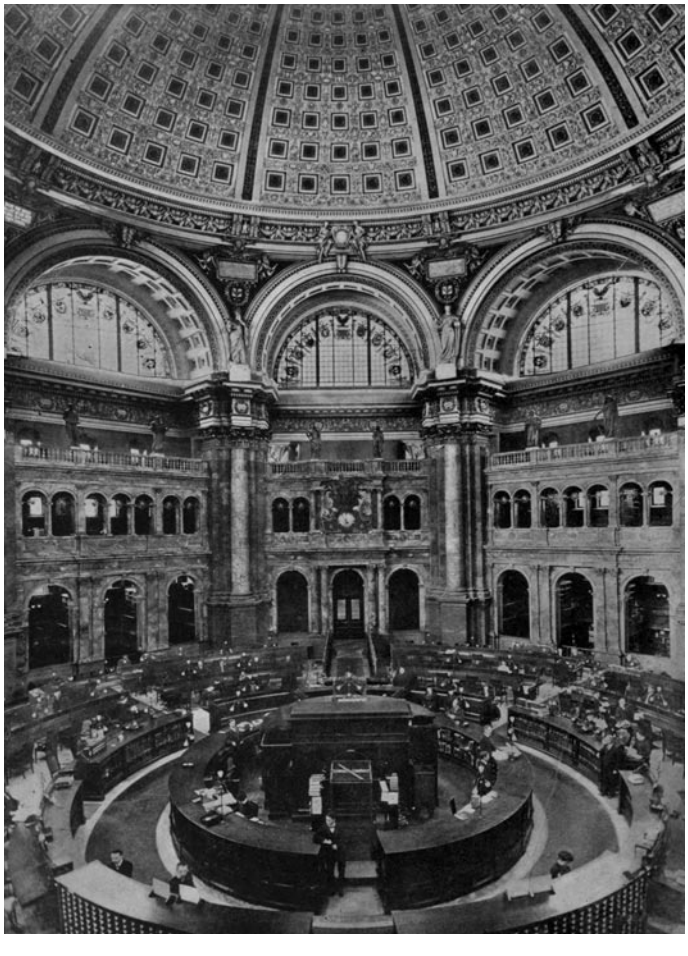


Opposite: Library Bureau. Card catalogue tray cases. From *Classified Illustrated Catalog of the Library Bureau: A Handbook of Library and Office Fittings and Supplies* (1900).

Left: Schicht and Field Company. Metal pigeonhole cabinets. From Schicht and Field Company, *Labor-Saving Devices for Mercantile and Public Offices* (1880).

by transferring to standardized cards the bibliographic information that was previously recorded only in books and on slips of paper. Each card received a serial number that corresponded to the order of the work's registration in the Copyright Office and, eventually, a Library of Congress identification number. By 1919 the Card Division had grown so large that it required its own stacks.

The most important work of the Card Division, however, was carried out not within the confines of the library but beyond. At first the office printed extra cards only for the use of the Library of Congress itself. But in October 1901 the library determined that these extra copies could be sold at a fair price to other libraries "to promote the advancement of bibliography and library economy."[65] Although the services of the Card Division were initially offered to libraries exclusively, within a few years anyone could order cards from the Card Division of the library. By 1902 the Printing Office was printing cards at a rate of 175 titles a day and 50,000 titles a year.[66] The card production introduced new forms of portability. In 1904 about three-fifths of the cards were sold through "traveling catalogues" that any library could request from the Library of Congress for the length of two months, after which time the catalogue had to be returned with shipping costs paid by the requesting library.[67] Such measures not only provided bibliographic information to smaller libraries but helped them make decisions about what items to purchase in particular subject areas.[68] In 1965—that is, six years before the card catalogue was supplanted by MARC, the Machine Readable Catalogue, which is today accessed through the internet—



Right: John L. Smithmeyer, Paul J. Pelz, and Edward Pearce Casey. Main Reading Room rotunda, new Library of Congress (Thomas Jefferson Building), Washington, DC, ca. 1900. Library of Congress, Prints and Photographs Division, LC-DIG-det-4a11688.

Opposite, top: Stacks in the Card Division of the Library of Congress, ca. 1919. Library of Congress, Prints and Photographs Division, US GEOG FILE—Washington, DC, Library of Congress.

Opposite, bottom: People working in the Card Division of the Library of Congress, ca. 1900. Library of Congress, Prints and Photographs Division, LC-USZ62-118631.

the Card Division of the Library of Congress reached its peak subscription: it had 17,000 subscribers and sold over 61.5 million cards that year.[69]

The American Library Association had been advocating since its inception for cataloguing that was "cooperative." What they meant by this by the turn of the century, however, amounted to little more than standardizing rules for cataloguing.[70] For the card reproduction to have the "cooperative" impact that reformers at the American Library Association envisioned, what was needed was a database like that of the Library of Congress—that is, a database that was

not only large but complete. The Card Division of the Library of Congress was the implementation of "cooperative cataloguing" at a much more ambitious scale.[71] As Putnam explained in the first edition of the library's *Handbook of Card Distribution*, the cost of producing even a single entry for the card catalogue was substantial, including the labor of the expert cataloguer and the labor of the typist, the printer, and the sorter, to say nothing of the cost of composition, presswork, paper, ink, and postage.[72] What was the point of duplicating this effort and expense at libraries across the United States? "American instinct and habit revolt against multiplication of brain effort and outlay where a multiplication of results [could] be achieved by machine."[73] That the Library of Congress ought to produce cards for the entire country simply made sense: not only because it was by now poised to be the largest library in the Western hemisphere but because it received two copies of every work soon after—and sometimes before—publication. As the historian Jane Rosenberg points out, by providing bibliographic information, frequently before the appearance of a publication, the Card Division ended up promoting new and forthcoming publications on behalf of the publishing industry, thereby expediting acquisition decisions by libraries across the country.[74]

The decision to distribute cards, then, was a significant move, one that helps explain the underlying commercial rationale of a field that called itself "library economy" at this particular moment. Putnam imagined a system in which the smaller institutions pooled their funds to purchase the card service at a nominal price. In 1902 the production of cards for each title cost the Library of Congress 25 to 35 cents per title.[75] The same year the Card Division charged 2 cents for every first card and 0.5 cents for each card ordered subsequently.[76] For a small library, Putnam argued, this constituted significant savings of money and time. Once the services of the Card Division were in place, library commissions were formed across the country to collect small libraries' card orders, forward them to the Library of Congress, and distribute the cards once they were received.[77] The revenue from the sale of cards increased dramatically from almost $4,000 in the fiscal year 1901–1902 to over $24,000 in 1908–1909, but, as Charles Harris Hastings, the chief of the Card Division, stressed, the Library of Congress did not make any money from the enterprise.[78]

Meanwhile catalogue-making led to more catalogue-making. Before the introduction of the card catalogue into the Library of Congress, the printed catalogue in book format was the primary index of the library's collection. The structure of the old congressional library, conceived as a representation of the mind, was itself represented by a book. The card catalogue, apart from begetting the Card Division, which needed its own catalogue, and traveling catalogues that could be borrowed and returned to the Library of Congress, gave rise to

printed catalogues that advertised the activities of the Card Division in pamphlet form. The card catalogue was thus ultimately represented by books as well. In such iterations, the library catalogue transformed into its commercial cousin, the mail-order catalogue that was in widespread use in turn-of-the-century United States.[79] Furthermore, from 1901 onward, the activities of the Card Division were complemented with a "National Union Catalog," a consolidated catalogue that included important publications not held at the Library of Congress.

Whether real, as in the case of the Library of Congress catalogue, or imaginary, as in the case of the National Union Catalog, these cataloguing efforts brought the center to the periphery. Putnam explained the effect of the catalogue-making efforts of the Library of Congress: they "place[d] in each local center of research, as complete as possible a statement of the contents of the national collections at Washington." Regardless of its size, every small library was now part of a bibliographic network at whose center sat the Library of Congress, which meant that researchers could ascertain bibliographic information even though the work in question might not be at their local library. Furthermore, the introduction of the distribution services of the Card Division coincided with the development of the Interlibrary Service.[80] Not only bibliographic information but the books themselves could be accessed by qualified researchers across the country. Putnam stressed that the Library of Congress was now effectively more than a bibliographic bureau; it was a bureau of information for the entire United States.[81]

Yet, not every point in the periphery had an equal share of the information in the center. The Library of Congress classification system was ultimately adopted only by larger and more academically oriented libraries. The economy of giving and taking between libraries, after all, was a more complicated affair than what Putnam described. First, not every institution in the system was equal. In fact, the Library of Congress had an entirely different arrangement with libraries that fell within the category of "depository libraries."[82] Although these libraries were chosen to make sure that the entire country was covered geographically, priority was given to locations that were considered "centers of educational activity" or "centers of library activity."[83] Instead of selling cards to these institutions, the Library of Congress "deposited" its cards at these libraries for free, or, rather, in exchange for cards printed by them—despite the fact that the Library of Congress produced cards at a rate no other institution could hope to match. For example, Putnam explained that just as a copy of every card printed by the Library of Congress went out to the New York Public Library, a copy of every card printed by the New York Public Library came to the Library of Congress.[84]

Second, librarians from the smaller institutions complained that the library's card service did not help them economize as Putnam claimed.[85] The paperwork

involved in ordering cards from the Library of Congress was substantial. The librarians had to read the printed catalogues of the Card Division and master intricate procedures before ordering the cards needed by their institutions. The labor that went into filling out the order slips was not significantly less than the labor of entering information from scratch on blank cards, especially because the Library of Congress would provide only "main entry cards," written for author headings. The card for each work then had to be rewritten by the requesting library for other headings—subject, title, and so on—straining the resources of smaller libraries.[86] In other words, the various catalogues of the Library of Congress did not so much save time and labor as reconfigure their arrangement over a network of its own making. If, as Putnam noted, the federal government of the United States "in its executive capacity [was] itself investigator, author, publisher, manufacturer, distributor, statistician, bibliographer, and librarian," it stacked the decks decidedly in favor of some and against others.[87]

IIIII

These days one customarily imagines that data is collected or mined from the world as if it were a natural resource; that computational technologies organize and reorganize it; and that visualization techniques make it legible to human beings.[88] A database, by this logic, is a representation of the world. If this late-nineteenth-century history of the Library of Congress is any indication, a database is not so much a representation of the world as a reconstruction of it. The work of the Library of Congress entirely reorganized the world of information in the United States at the end of the nineteenth century by subsidizing the operations of libraries as well as those of a growing publishing industry—albeit in ways that favored some over others. It invented a new kind of reader, one who was not expected to arrive at the library with preexisting learning but who would now be taught and served by the library. If copyright law became enforceable in the United States at this particular moment, it was because of these developments. In other words, authorship was not a natural category that was bound to assert itself sooner or later but one that was established as a result of the database built by the Library of Congress. What stabilized intellectual property was the work of an army of clerks armed with ingenious equipment: officials who filed copyright claims in file cabinets, librarians who recorded bibliographic information on cards to be put away in card catalogues, staff who placed those works on the shelves of the Snead bookstacks, typists who copied the information on more cards, printers who reproduced those cards in addition to the pamphlets that advertised them, and the network of librarians everywhere who ordered, reworked, and filed that information away in their own shelves, cabinets, and drawers.

Notes

1. Ainsworth Rand Spofford, *Annual Report of the Librarian of Congress for the Year 1875*, 44th Cong., doc. no. 31 (Washington, DC: Government Printing Office, 1876), 7.

2. Spofford, *Annual Report of the Librarian of Congress for the Year 1875*, 4.

3. The Confederate states kept a separate register for copyright from 1861 to 1865 that was later absorbed by the Library of Congress. Raymond Robinson, "Confederate Copyright Entries," *William and Mary Quarterly* 16 (1936): 248–66.

4. In 1888, Boston Public Library had 200,000 volumes and Harvard University 250,000. Edward C. Towne, "The Congressional Library Question," *North American Review* 147, no. 381 (August 1888): 228–29.

5. On the importance of the postal system, see Richard R. John, *Spreading the News: The American Postal System from Franklin to Morse* (Cambridge: Harvard University Press, 1995).

6. John Y. Cole, "Struggle for a Structure," in *The Library of Congress: The Art and Architecture of the Thomas Jefferson Building*, ed. John Y. Cole and Henry Hope Reed (New York: W.W. Norton, 1997), 40.

7. Historians have argued that the first legal frameworks to protect intellectual property can be traced even further back to the Florentine patent statute of 1421 and to a 1474 statute of the Venetian Republic. See Bruce W. Bugbee, *Genesis of American Patent and Copyright Law* (Washington, DC: Public Affairs Press, 1967), 12–27.

8. In the Anglo-American tradition, intellectual property is usually said to encompass the areas of copyright, patent law, and trade-secret law.

9. John Locke, "Of Ideas and Their Origin," in *Essay Concerning Human Understanding*, bk. 2 (1689; New York: Dover, 1959), 121–43; and John Locke, "Of Property," in *Two Treatises of Government*, ed. Peter Laslett (1690; Cambridge, UK: Cambridge University Press, 1988), 285–302.

10. The British Statute of Anne, 10 April 1710. Twenty-one years was for already printed works and fourteen years for works composed but not printed. By the early nineteenth century, English debates about copyright were unfolding parallel to those about free-trade policies. Peter Baldwin, *"The Copyright Wars": Three Centuries of Trans-Atlantic Battle* (Princeton, NJ: Princeton University Press, 2014), 110.

11. United States Constitution, article I, section 8, clause 8. For a dated yet still helpful account of the beginnings of American intellectual property law, see Bugbee. The first copyright law of the United States is usually cited as that passed on 31 May 1790. The law provided protection for up to twenty-eight years and required that a copy of the work be deposited in the clerk's office of the local U.S. district court and another one with the secretary of state. Chace's comment comes from U.S. Congress, *Reports of Committees of the Senate of the United States for the 1st Session of the 50th Congress*, doc. no. 31 (Washington, DC: Government Printing Office, 1888), 19 March 1888.

12. American print runs in the nineteenth century were typically four times the size of British ones but the price per book in the US was usually much lower. By the end of the nineteenth century, the American market was twice the size of the British. Baldwin, 117, 119.

13. Baldwin, 121. Also see Barbara Hochman, *"Uncle Tom's Cabin" and the Reading Revolution: Race, Literacy, Childhood, and Fiction, 1851–1911* (Amherst: University of Massachusetts Press, 2011).

14. Copyright for foreign authors again posed a problem. Spofford attempted to establish a similar kind of exchange agreement with other countries but did not have much success. See David Mearns, *The Story Up to Now: The Library of Congress, 1800–1946* (Washington, DC: Library of Congress, 1947), 105–6.

15. Cole, "Struggle for a Structure," 35.

16. The idea of possessive individualism was theorized by C.B. Macpherson, *The Political Theory of Possessive Individualism: From Hobbes to Locke* (Oxford, UK: Clarendon Press, 1962). Slavery was a thorn in the side of possessive individualism from the beginning. See Jennifer Rae Greeson, "The Prehistory of Possessive Individualism," *PMLA* 127, no. 4 (October 2012): 918–24, which discusses Venture Smith's *A Narrative of the Life and Adventures of Venture, a Native of Africa: But Resident above Sixty Years in the United States of America: Related by Himself* (New London: Holt, 1798).

17. See, for example, Josef Kohler, *Philosophy of Law*, trans. Adalbert Albrecht (New York: A.M. Kelley, 1969); L. Becker, "Deserving to Own Intellectual Property," *Chicago-Kent Law Review* 68 (1993): 609–29; Wendy J. Gordon, "A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property," *Yale Law Journal* 102 (1993): 1,533–1,609; Adam D. Moore, "A Lockean Theory of Intellectual Property," *Hamline Law Review* 21 (1998): 65–108; Tom G. Palmer, "Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects," *Harvard Journal of Law and Public Policy* 13 (1990): 817–66; and Ken Himma, "Justifying Intellectual Property Protection: Why the Interests of Content-Creators Usually Wins Over Everyone Else's," in *Information Technology and Social Justice*, ed. Emma Rooksby (Hershey, PA: Information Science, 2006). An alternative theory follows a different trajectory that can be traced to utilitarianism: that without guarantees of intellectual property, authors and inventors would not have the incentive to make new works, which would ultimately lead to social decline. For this theory, see S. Chesterfield Oppenheim, "A New Approach to Evaluation of the American Patent System," *Journal of the Patent Office Society* 33, no. 8 (August 1951): 555–68; Fritz Machlup, *Production and Distribution of Knowledge in the United States* (Princeton, NJ: Princeton University Press, 1962); Edwin C. Hettinger, "Justifying Intellectual Property," *Philosophy and Public Affairs* 18 (1989): 31–52; Ejan Mackaay, "Economic Incentives in Markets for Information and Innovation," *Harvard Journal of Law and Public Policy* 12 (1990): 867–909; Patrick Croskery, "Institutional Utilitarianism and Intellectual Property," *Chicago-Kent Law Review* 68 (1993): 631–57; and Adam D. Moore, *Intellectual Property and Information Control: Philosophic Foundations and Contemporary Issues* (New Brunswick, NJ: Transaction, 2001).

18. Herbert Small, *Handbook of the New Library of Congress in Washington, with Essays on the Architecture, Sculpture, and Painting by Charles Caffin, and on the Function of a National Library by Ainsworth R. Spofford* (Boston: Curtis and Cameron, 1897), 128.

19. For a good history of the Library of the British Museum, see P.R. Harris, *The Library of the British Museum: Retrospective Essays on the Department of Printed Books* (London: British Library and Cambridge University Press, 1991).

20. Ainsworth Rand Spofford, "A 'Wholly Distinct' Library Building" (1872), in *Ainsworth Rand Spofford: Bookman and Librarian*, ed. John Y. Cole (Littleton, CO: Libraries Unlimited, 1975), 78.

21. Theodore W. Koch, "Planning a Library Building with Special Reference to Bookstacks," *Michigan Libraries* 1, no. 4 (June 1912); reprinted in Snead and Company Iron Works, *Library*

Planning: Bookstacks and Shelving (Jersey City, NJ: Snead and Company Iron Works, 1915), 109.

22. Small, 80.

23. Small, 81.

24. Snead and Company Iron Works, 75.

25. Bernard R. Green, *Book Stack and Shelving for Libraries* (Jersey City, NJ: Snead and Co., 1908), 15.

26. Charles Henry Baumann, "The Influence of Angus Snead MacDonald and the Snead Bookstack on Library Architecture" (Ph.D. diss., University of Illinois, 1969), 122.

27. Bernard R. Green, "Library Bookstacks in the Dark" (paper presented at the Baltimore meeting of the American Association for the Advancement of Science, 1909); reprinted in Snead and Company Iron Works, 118.

28. John Russell Young, *Report of the Librarian of Congress*, 55th Cong., 2nd sess., doc. no. 13 (Washington, DC: Government Printing Office, 1897), 7.

29. Snead and Company Iron Works, 75.

30. Green, *Book Stack and Shelving for Libraries*, 15–16. Emphasis mine.

31. Eric Garberson, "Libraries, Memory and the Space of Knowledge," *Journal of the History of Collections* 18, no. 2 (2006): 105–36.

32. Young, 4.

33. Young, 7.

34. Young, 17.

35. Ainsworth Rand Spofford, "The Problem with Classification" (1900), in *Ainsworth Rand Spofford*, 174.

36. Library of Congress, *The Exhibit of the Catalog Division*, Notes for the Louisiana Purchase Exposition, St. Louis, MO, 1904, no. 3 (Washington, DC: Government Printing Office, 1904), 8.

37. See, for example, Mearns, 28–29. In the 1815 catalogue, books were arranged alphabetically in each Jeffersonian class, and an alphabetical list of author names was provided. Jefferson's classification was retained in the catalogues of 1830, 1839, 1849, and 1861.

38. John Y. Cole, "The Library of Congress in the Nineteenth Century: An Informal Account," *Journal of Library History* 9, no. 3 (July 1974): 236.

39. Cole, "The Library of Congress in the Nineteenth Century," 224.

40. The Smithsonian, for example, had a more elaborate cataloguing system in place. Mearns, 58. In a chapter of the catalogue printed in 1854, an attempt was made to consolidate the cataloguing efforts of the Library of Congress and the Smithsonian Institution, but Smithsonian librarian Charles Coffin Jewett's efforts bore no fruit. Library of Congress, 9.

41. Library of Congress, 9–10.

42. For a history of the library up to that point, see William Dawson Johnston, *History of the Library of Congress, 1800–1864*, vol. 1 (Washington, DC: Government Printing Office, 1904).

43. A.R. Spofford, "Preface," in *Catalogue of the Library of Congress*, vol. 1 (Washington, DC: Government Printing Office, 1869), iii.

44. Spofford, "Preface," iii; emphasis added.

45. See John Tresch, "Technological World-Pictures: Cosmic Things and Cosmograms," *Isis* 98, no. 1 (2007): 84–99. For cosmograms in the early modern period, see Frances A. Yates, *The Art of Memory* (1966), in *Selected Works of Frances Yates*, vol. 3 (London: Routledge, 2001); and Paolo Rossi, *Logic and the Art of Memory: The Quest for a Universal Language*, trans. Stephen

Clucas (London: Continuum, 2006).

46. On the severing of this tie in Enlightenment encyclopedism, see Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1966; New York: Vintage, 1994); and Richard Yeo, *Encyclopaedic Visions: Scientific Dictionaries and Enlightenment Culture* (Cambridge, UK: Cambridge University Press, 2001).

47. Spofford, "Preface," iv.

48. On Cutter, see Francis L. Miksa, *Charles Ammi Cutter, Library Systematizer* (Littleton, CO: Libraries Unlimited, 1977). On Dewey, see Wayne A. Wiegend, *Irrepressible Reformer: A Biography of Melvil Dewey* (Chicago: American Library Association, 1996).

49. Apart from his activism as a librarian, Dewey took it upon himself to simplify the spelling of the English language and advocate for temperance, the metric system, and domestic science, among other things.

50. Melvil Dewey, "The Profession," *Library Journal* 1, no. 1 (1876): 6; emphasis in original. Dewey was the journal's managing editor.

51. Dewey, "The Profession," 6.

52. Sidney Ditzion, "Social Reform, Education, and the Library, 1850–1900," *Library Quarterly: Information, Community, Policy* 9, no. 2 (April 1939): 156–84.

53. Melvil Dewey, *A Classification and Subject Index for Cataloguing and Arranging the Books and Pamphlets of a Library* (Amherst, MA: Case, Lockwood, and Brainard, 1876).

54. Charles Ammi Cutter, *Expansive Classification*, 2 vols. (Boston: Cutter, 1891–1893).

55. Cutter's system did not prove to be as popular as Dewey's, although most academic libraries, in addition to the Library of Congress, adopted Cutter's classification scheme.

56. Markus Krajewski, *Paper Machines: About Cards and Catalogs, 1548–1929*, trans. Peter Krapp (Cambridge: MIT Press, 2011), 87–122.

57. Melvil Dewey, *Decimal Classification and Relativ Index for Arranging and Indexing Public and Private Libraries and for Pamflets, Clippings, Notes, Scraps, Books, Index, Rerums, Etc.* (Boston: Library Bureau, 1885), 28.

58. Dewey, *A Classification and Subject Index*, 4.

59. Dewey, *A Classification and Subject Index*, 6–7.

60. Dewey, *Decimal Classification and Relativ Index*, 28.

61. See, for example, Ann Blair, "Information Management," in *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven: Yale University Press, 2010), 11–61; and Krajewski, 9–24.

62. JoAnne Yates, *Control through Communication* (Baltimore: Johns Hopkins University Press, 1993), 21–64. Also see Cornelia Vismann, *Files: Law and Media Technology*, trans. Geoffrey Winthrop-Young (Stanford, CA: Stanford University Press, 2008): 71–122.

63. *Classified Illustrated Catalog of the Library Bureau: A Handbook of Library and Office Fittings and Supplies* (Boston: Library Bureau, 1890), 13.

64. Library of Congress, 10.

65. Library of Congress, 18.

66. Herbert Putnam, "The Printed Catalogue Cards of the Library of Congress," in *Handbook of Card Distribution* (Washington, DC: Government Printing Office Library Division, 1902), 9.

67. These are the conditions stipulated for traveling catalogues in *Library of Congress Card Division Bulletin*, no. 10 (15 August 1916).

68. The traveling catalogues were also occasionally exhibited. Library of Congress, 19.

69. Gene Gurney, *The Library of Congress: A Picture Story of the World's Largest Library* (New York: Crown Publishers, 1966), 105.

70. For how the American Library Association was quick to endorse the Card Division of the Library of Congress, see *The Library Journal* 26, no. 26 (November 1901): 805.

71. Jane Aikin Rosenberg, *The Nation's Great Library: Herbert Putnam and the Library of Congress, 1899–1939* (Urbana: University of Illinois Press, 1993), 45–46.

72. Putnam, "The Printed Catalogue Cards of the Library of Congress," 2.

73. Putnam, "The Printed Catalogue Cards of the Library of Congress," 9.

74. Rosenberg, 50–59.

75. Putnam, "The Printed Catalogue Cards of the Library of Congress," 2.

76. *Handbook of Card Distribution* (1902), 32.

77. Rosenberg, 185 n. 31.

78. Charles Harris Hastings, *Library of Congress L.C. Printed Cards: How to Order and Use Them* (Washington, DC: Government Printing Office Library Branch, 1909), 23.

79. On how commercial catalogues were the products of other databases, see Zeynep Çelik Alexander, "The Larkin's Architectural Technologies of Trust," *Journal of the Society of Architectural Historians* 77, no. 3 (September 2018): 300–18.

80. Mearns, 175–76.

81. Herbert Putnam, "What May Be Done for Libraries by the Nation," *Library Journal* 26, no. 8 (August 1910): 14.

82. *Handbook of Card Distribution* (1902), 48.

83. *Handbook of Card Distribution* (1902), 48.

84. Putnam, "What May Be Done for Libraries by the Nation," 14.

85. Rosenberg, 52.

86. *Handbook of Card Distribution* (Washington, DC: Government Printing Office Library Division, 1907), 11.

87. Putnam, "What May Be Done for Libraries by the Nation," 9.

88. Among the few sources that provide a critique of this view, see Lisa Gitelman and Virginia Jackson, eds., *Raw Data Is an Oxymoron* (Cambridge: MIT Press, 2014).