

## The Place of Research Libraries in the Digital Age

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### I. INTRODUCTION

In this essay, I reflect on a topic posed to me by the organizers of a symposium on “the future of libraries in the digital age.” The topic is “Digitization, networked knowledge, and the rumored obsolescence of brick-and-mortar libraries.” The way in which the topic is stated – “rumored obsolescence” – invites the reader and the writer to take the position that brick-and-mortar libraries have a robust present and future. Indeed, I will wind up concluding that the robustness of the brick-and-mortar library is more likely than its obsolescence. There are a good number of policy reasons for preferring this outcome to a withering away of the physical library. This conclusion is necessarily speculative and contingent. I don’t have a well-specified model of the ecosystem of libraries, publishers, and users of libraries. All I can be sure of is that the future of libraries – digital, physical, and hybrid – will be determined by a complicated set of phenomena that are hard to forecast, including evolutions in technology, law, and custom.

The future configurations of libraries will be responsive to what society (which is to say, elements of society that are able to command the requisite resources) wants libraries to do. The task of engaging in

informed speculation about the future of libraries requires us to characterize the functions that libraries are likely to be called upon to perform in an environment of mass digitization and networked knowledge. As an economist, I will start with demand (we'll get to supply shortly). What do we want libraries to do in the future? Which of the things that we want libraries to do will best be done in buildings called "libraries?" Now, turning to supply, how will changes in technology change the ways in which libraries produce desirable outcomes? And how will all of these changes affect the institutional and fiscal arrangements that provide support for libraries and their work?

The discerning reader will notice that I tack back and forth between talking about libraries and physical, brick-and-mortar, libraries. I am unapologetic about the tacking. In order to answer the questions posed about physical libraries, we need to look at all of the activities plausibly delivered by libraries in any form, and then parse out the division among mechanisms of delivery. But to get ahead of the story, I'm reasonably certain that for the foreseeable future there will be a set of functions delivered by libraries in brick-and-mortar settings, complementary to functions delivered in other ways. This conclusion implies that there will be effective mechanisms to provide the requisite financial support.

A final introductory remark: Most of what I have to say applies to academic libraries – indeed to libraries in research universities.<sup>1</sup> This is not the only important kind of library, but it's the one I know best, having been both a provost and university librarian at an institution that is home to one of the world's largest academic libraries – the University of Michigan. Moreover, as provost and university librarian, I was closely involved in the largest mass digitization project to date, the Google Books Library Project, at Michigan and elsewhere. I was also one of the founders of the HathiTrust digital library, which has a growing digital collection that currently exceeds over 14.7 million volumes and uses only a modest amount of physical space to house its staff and servers.<sup>2</sup> I will say a few things about other kinds of libraries as I go along, but mostly I'm talking about large research libraries situated in universities, domestic and international.

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<sup>1</sup> The Ohio State University has an especially nice brick-and-mortar library that was substantially renovated and expanded during the digital age.

<sup>2</sup> *Statistics and Visualizations*, HATHITRUST DIGITAL LIBR., [https://www.hathitrust.org/statistics\\_visualizations](https://www.hathitrust.org/statistics_visualizations) [<https://perma.cc/9YPG-YUHS>].

## II. THE FUNCTIONS AND FUNCTIONING OF LIBRARIES<sup>3</sup>

In the beginning there was the collection, and the collection was, perforce, housed in physical buildings, with elaborate mechanisms to keep the collection both healthy and usable. Public libraries may have been “free to all,” in the felicitous phrase chiseled over the entrance of the Boston Public Library, but they were not easy to use. The great academic libraries, both private and public, were generally usable only by persons affiliated with their institutions. Except for public libraries that were organized to serve the general public, notably the Carnegie libraries, nothing was more important than protecting and preserving the collection. I personally remember the days when almost all academic libraries were closed stack, and in much of the world closed-stack libraries are still common. The great reading rooms, where we still read and study today, used to be (and in many cases still are) the only places where a patron could access the collection. Stacks were closed and patrons would ask books to be paged, and in due course (10 or 20 minutes)<sup>4</sup> the book would be brought to the patron, who would then read it in the reading room. This continues to be true of public research libraries such as New York Public and Boston Public. These are public libraries in the sense that the public has access to them (“free to all,”) but for the most part they are not lending libraries.

Many (probably most, but I don’t know of a data source that would settle the question) academic libraries limit access to the stacks to patrons who are affiliated with the library’s home institution, and similarly limit circulation. And, of course, special collections are generally closed-stack and noncirculating.

The continued existence of these large noncirculating or limited circulation collections implies that there is still a good deal of demand for brick-and-mortar libraries to perform the traditional functions of housing print collections. Below I will argue that mass digitization and networked knowledge will attenuate the demand for physical

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<sup>3</sup> For an extended discussion of the functions of libraries, see Paul N. Courant, *The Future of the Library in the Research University*, in *NO BRIEF CANDLE: RECONCEIVING RESEARCH LIBRARIES FOR THE 21<sup>ST</sup> CENTURY* 21-27 (2008).

<sup>4</sup> *History of the New York Public Library*, N.Y. PUB. LIBR., <http://www.nypl.org/help/about-nypl/history> [<https://perma.cc/X6VQ-XSHT>] (The New York Public Library proudly claims that when they opened their main building in 1911, the first book paged to a patron when the building opened took only six minutes to be delivered for reading.).

collections, but it will not eliminate it. Absent changes in copyright law or agreements between rightsholders and hosts of digital collections, the attenuated demand, even for “ordinary” collections, will remain large.

Organizing library policy with respect to the collection around safe housing and preservation made all the sense in the world well into the 20<sup>th</sup> century. Books were expensive to purchase, often difficult to replace once out of print, and expensive and time-consuming to transport from other locations. If the University of Michigan, or The Ohio State University, or Boston Public were to lose a copy of an important work, it would generally be difficult either to replace it permanently or to borrow another copy. By keeping control of their physical collections, librarians could assure (or come close to assuring) continued access for future patrons as well as current ones. Such access is essential to academic research. So long as there is a practical advantage for scholars and students to have access to a physical collection that is nearby and organized to contribute to the expertise and interests of the local institution, universities will find it valuable to maintain local access. This vital function of libraries can be performed electronically for materials that are licensed and for digitized materials that are in the public domain. In these cases the library often assists researchers and students in obtaining access both to local and remote electronic resources.

However, in the current copyright environment, much of the literature that is important to academic work can be accessed only in physical form. Physical collections provide the only way that libraries and their patrons can access the content that is not in the public domain. It is plausible that academic institutions can reduce duplication of such works nationally and internationally; but in order to meet demand for access to the scholarly and cultural records, academic libraries will continue to need a lot of shelf space for the foreseeable future. Strikingly, many institutions are increasing their capacity for long-term access to print materials and many new works are available only in print. Thus, the most traditional of uses of brick-and-mortar libraries – providing long-term, reliable access to print materials – will continue for some time to come, even as an increasing fraction of new works are produced and used in electronic form. And, of course, special collections will continue to require brick-and-mortar libraries to support their preservation and use.

Once a library collection is housed in a building or set of buildings, the buildings themselves become nodes for all manner of academic work. The librarians who curate the collections have specialized

knowledge. They know what is in their library and of materials in other libraries that relate to their local collections and to the interests of the scholarly communities that they serve. These expert librarians perform all of the classic functions of a university – research, teaching and service – because their knowledge of collections and their ability to find useful material situates them to do so.

Librarians teach undergraduates how to use the library (which is to say, how to use materials relevant to learning). They work with graduate students and faculty on research projects. They go beyond the catalog to identify finding aids and bibliographies. They organize public-facing uses of the collection that are of general interest on campus and to the broader community. They answer reference questions. They provide space for both individual and group work. This set of activities, built around knowledge of and access to collections, is essential to the functioning of university libraries, and their universities, whether the collections themselves are local or distant, electronic or in print.

Finally, just as the collections are nodes for a rich set of activities that are part of academic work, the library itself, sitting at the center of campus, open to use by students and faculty for long hours, housing broad expertise, has become the obvious place for facilities ranging from virtual reality caves to 3-D printers to audio and video studios. For a century and more, libraries specialized in holding and facilitating the use of printed material – expensive objects (books, maps, microforms) that could be easily shared over time by any user (and, hence, many users) who would take the time and effort to walk to the library. Today, in addition to printed materials, the library holds other kinds of expensive objects that are essential to the infrastructure of scholarly use and production. Many of these new objects are sophisticated and require substantial expertise to be used well. In this, they are functionally similar to traditional collections. And by virtue of location in the library, they are at the center of campus, generally easy to find and walk to.

### III. MASS DIGITIZATION AND NETWORKED KNOWLEDGE

How do mass digitization and networked knowledge affect the functions and functioning of libraries, and what are the implications of these effects on the future of the brick-and-mortar-library?

From the outset, it's important to note that mass digitization and networked knowledge are not the same thing. It's also important to distinguish between digitization of materials that were born in print,

and digital collections of materials that were born digital. A great deal of the older print scholarly journal literature, originally produced in print, has now been digitized, while current and more recent issues of the same journals are born digital.

These two forms of digital work pose different problems for libraries that are concerned with the integrity of their collections over time. Some libraries still hold print copies of works that were born in print and were later digitized. Under the doctrine of first sale, these libraries have the right to use those print copies – to lend them to patrons, to make copies of deteriorating or lost volumes for purposes of preservation, and for other purposes. The library typically has no such rights to works that are produced in digital form and licensed to the library, as is the case with many academic journals and, increasingly, academic works that are produced as e-books. The interest of the academic library (or system of academic libraries) in long term preservation is both technically and legally more difficult in the case of born-digital works than in the case of works that were born in print. Even when there is language in the licensing agreement that gives the library permanent rights to use works that are sitting on publisher's servers, those rights may not survive business exigencies or technical difficulties, and the libraries will generally not possess the files that would be requisite to assure preservation.<sup>5</sup>

Not all digital works held by libraries, then, are created equal. For works still in copyright, the digitized copies of library-owned print collections can be searched, but generally they cannot be made available for reading, except to patrons certified as having print disabilities. As we have noted earlier, the print form of these works can be read in the traditional library way (go to the shelf, get the book, read it), but many digital affordances of digitized copies are not legally available; patrons cannot access the full text remotely, nor may they make copies of the digital version for their own use. Thus, the brick-and-mortar library remains the only reliable guarantor of access and preservation to in-copyright works that were born in print. Meanwhile, library-licensed digital collections – works born digitally and licensed by the copyright holder for digital use – generally can be read by patrons, locally or remotely, and licenses often permit downloading single copies for patron use, subject to terms of use that

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<sup>5</sup> For an excellent treatment of the preservation of cultural and scholarly materials, with particular emphasis on the profound difficulties involved in preserving digital works, see ABBY SMITH RUMSEY, *WHEN WE ARE NO MORE: HOW DIGITAL MEMORY WILL SHAPE OUR FUTURE* (2016).

prohibit further copying. However, the digital files are generally not available to the library for preservation.

As one searches the library to find older and newer literature, it's often the case that one finds older work in, say JStor, and newer works on the publisher's website. One can have a collection, or set of collections, that is fully digitized without it being organized into a usable network. Indeed, much of the currently-produced electronic literature is digitized but not organized to take advantage of potential networking, and it is often quite difficult to use e-resources that are licensed to academic libraries and their patrons.

When people ask questions about the future of the library in the digital age, they often imagine that everything, or almost everything, will be available digitally via a seamless network of resources. That isn't the world we live in, and won't be any time soon. Still, it's interesting to explore the question: what would be the role of the brick-and-mortar library in an environment of ubiquitous and usable digitization of library collections?

#### IV. DIGITAL LIBRARY UTOPIA

Suppose that pretty much everything that had ever been published were available online, pretty much everywhere, and that the rights and technical environments were such that the works would continue to be available for the indefinite future – pretty much forever, on reasonable terms. Such a world could be described as one of ubiquitous digitization (of which conventional mass digitization is merely a subset) and it would of course be easy to create networks of knowledge using source material consisting of almost everything that was ever available, almost everywhere.<sup>6</sup>

The world that I have just described is far from the world we live in, for a variety of reasons, not the least of which is the law. Consider

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<sup>6</sup> An instructive example is the Advanced Papyrological Information System and its kin, which provide digitized images and associated metadata for a large fraction of papyri that are of scholarly interest. Papyri are in the public domain, and curators and scholars in the field have an interest in sharing the source material for the work broadly. The network enables, among other things, the electronic piecing together of fragments (the unit of collection in papyrology) that have become physically disconnected, often residing on different continents. Papyrologists have a rich electronic network of knowledge and source materials at their disposal. This kind of network is generally not available in other scholarly communities, although some scientific data (e.g., the Sloan Digital Sky Survey) is widely shared over the Internet. See POPYRI.INFO, <http://papyri.info/> [<https://perma.cc/BLD5-VM88>].

the HathiTrust, a digital library whose membership includes over a hundred academic libraries, and which holds over 14.5 million digitized volumes. Members of the HathiTrust do not have the right to read digitized copies of in-copyright works – even works for which they provided the original text – legally acquired through purchase or receipt of gifts – that was digitized. The digital text can be searched or used for computational research, but it cannot be used (except for persons with print disabilities) in the same way that the original books can be used. For example, The Ohio State University Library has contributed over 150,000 works to the HathiTrust collection,<sup>7</sup> but except for works in the public domain, the librarians and the library's patrons, should they have reason to read one of the books, must obtain a physical copy from the library. Today's reality is thus a far cry from "pretty much everything, pretty much everywhere," and brick-and-mortar libraries are thus essential to successful research libraries. Suppose that the technical and legal issues that prevent realization of the utopian vision were somehow resolved. Is there still a role for brick-and-mortar libraries?

Collection development is an essential function for any library, and especially so for academic libraries, which are configured to serve the particular teaching and research needs of their faculty and students. With ubiquitous usable digital collections, the technical and fiscal aspects of collection development would be much simplified. Except for special collections of various kinds, any library could make essentially all published work available to its users at low or zero marginal cost.<sup>8</sup> Collection development, as we know it, would be much less broad in compass than it is today, and there would be substantial resource savings associated with the ease of sharing most published work to users around the world.

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<sup>7</sup> *Deposited Volumes by Original Source of Content – Daily Statistics*, HATHITRUST DIGITAL LIBR., [https://www.hathitrust.org/visualizations\\_deposited\\_volumes\\_current](https://www.hathitrust.org/visualizations_deposited_volumes_current) [<https://perma.cc/R6BW-NXPT>].

<sup>8</sup> Producing and publishing scholarly work would continue to be costly, of course, and in some form or another the academy and other sponsors and producers of research would bear those costs, as they do now. But distributing academic work once it was published in digital form would cost essentially nothing, and in the utopian world of ubiquity and utility one can imagine many business models in which users and their agents (including libraries) would have access to global collections at low or zero marginal user cost. Business models that would work well for trade and for-profit publication are less easy to visualize.

It would still be the case, however, that someone – and I would expect it would be librarians – would provide expertise in the intricate details of specific literatures and collections in a world of ubiquitous collections. In the networked world we are describing, there will be any number of digital products and specialized affordances that will be essential to cutting-edge scholarship in particular fields. Sharing this kind of knowledge, which requires deep expertise in the literature, research problems and research methods, by its nature can't be ubiquitous and freely distributed across the globe. Moreover, to the extent that particular universities' strengths in the future will be built on their current strengths, existing concentrations of expertise will likely continue into the future, embodied in subject specialist librarians, as it is today.

I cannot be certain that academic institutions will continue to pay for the services provided by librarians with subject and pedagogical expertise, but I believe it to be highly likely that they would. For one thing, such loci of expertise are part and parcel of the reputation and competitive advantage of individual universities, and thus are valued by the university leadership, much as collections and the expertise to use them well have always been valued (and paid for). Additionally, faculty and students, who are the proximate users of the services of library expertise, will continue to benefit from access to the expertise.

Moreover, there is no trace in the data that the number of skilled professionals employed by the leading academic libraries is falling over time. Between 2006 and 2015 the number of professional staff<sup>9</sup> employed by libraries that are members of the Association of Research Libraries – which is to say, the largest and most prestigious academic libraries in the United States – grew slightly, from 11,008 to 11,569.<sup>10</sup> There has been a great deal of wailing and gnashing of teeth about the pressure placed on library budgets by increased serials costs.

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<sup>9</sup> The ARL libraries report numbers of professional staff, rather than “librarians” per se because the way in which such staff are classified varies across time and institutions. For example, in some libraries staff who are expert in working with digital data will be called “data librarians,” whereas in others they might be called “information technologists.” In both cases, they are providing local expertise so that patrons may use local and digital collections effectively. See ASS'N OF RES. LIBR. ARL STATISTICS QUESTIONNAIRE, 2015-16, (2016), <http://www.libqual.org/documents/admin/16instruct.pdf> [<https://perma.cc/QE4A-5DDE>].

<sup>10</sup> *Publications*, ARL STATISTICS, <https://www.arlstatistics.org/publications> [<https://perma.cc/6SMC-PFWZ>] (Author's calculations based on data reported in the ASL).

However, it can be inferred from the fact that professional staff have held their own that the leading research institutions continue to value the services provided by library professionals.

Earlier in this essay I spent some time on the problem of digital preservation and the difficulties posed by a rights environment in which libraries and related institutions are unable for legal reasons to assure the integrity of digital works over time. In the utopian vision that I have sketched for this discussion, the rights environment would not be such a problem, but there will remain the question, especially for cultural objects in a variety of digital media – of what should be preserved and who will pay for it. I am imagining that the ubiquitous scholarly collection, that is broadly available to the academy and the world for use, will also be available for preservation, and that the academic libraries will be able to solve the collective action problem associated with making sure that a sufficient number of independently held digital instances of each work exist and are maintained. Such a system could be built on any of several preservation initiatives and platforms currently in existence, including DPN, Portico, LOCKSS, and CLOCKSS.<sup>11</sup> Moving away from the utopian vision, it's worth reemphasizing that in the current world, preservation is anything but assured, and the efforts of the various initiatives and platforms to assure preservation of the scholarly literature require continuing attention. Meanwhile, the cultural literature, where "literature" includes video, audio and fancier mixed media, is extremely fragile, both technically and organizationally, and is therefore at risk. Hence the wonderfully apt title of Abby Smith Rumsey's book, "When We Are No More."<sup>12</sup>

The past several years have seen academic libraries become increasingly active in academic publishing.<sup>13</sup> Historically, of course,

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<sup>11</sup> There have been a number of initiatives designed specifically to assure the preservation of scholarly literature in digital form. See, e.g., PORTICO, <http://www.portico.org/digital-preservation/> [<https://perma.cc/2WUC-KZBD>]; LOCKSS: *Lots of Copies Keeping Stuff Safe*, LOCKSS, <https://www.lockss.org/> [<https://perma.cc/TP3Z-2YAY>]; *The CLOCKSS Archive: A Trusted Community-Governed Archive*, CLOCKSS, <https://www.clockss.org/clockss/home> [<https://perma.cc/67SW-WWMW>]; *The Digital Preservation Network*, DPN, <https://www.dpn.org> [<https://perma.cc/94L5-UEBJ>].

<sup>12</sup> RUMSEY, *supra* note 5.

<sup>13</sup> See GETTING THE WORD OUT: ACADEMIC LIBRARIES AS SCHOLARLY PUBLISHERS (Maria Bonn & Mike Furlough ed., 2015); *Promoting innovative, sustainable publishing services in academic and research libraries*, LIBR. PUBL'G COAL., <http://librarypublishing.org/> [<https://perma.cc/SA2M-X5DA>].

academic libraries have always been in the publishing business – literally the business of making works public. It is academic libraries that have assured continuing access to published literature that is out of print, which is to say, the vast majority of published literature. To the extent that academic presses are increasingly situated in libraries, there may be a physical presence as well, especially for print-on-demand versions of works that are born digital.

Additionally, the same subject specialists who are so important to the development of scholarly work and scholarly production are well-situated to learn how to act as editors and publishers in those fields. And libraries – especially large academic libraries – have technologically sophisticated staff who are capable of ingesting and transmitting (that is, collecting and distributing) academic work produced in a variety of media. This set of functions for libraries and librarians is likely to grow, and its growth may lead to cost savings and performance improvements in the production and distribution of scholarly literature. Academic libraries are, perforce, nonprofit enterprises, and the great majority of scholarly writing is produced without any expectation that the author will receive any share of sales. Library-based publication is potentially a good fit for many academic authors and their publishers.

#### V. BRICK-AND-MORTAR LIBRARIES IN A NETWORKED WORLD

A signal attribute of the Internet is that it is technologically feasible to access everything regardless of the location of the object being accessed (a server, somewhere on the Web) and regardless of the geographic location of the entity that is doing the accessing. This technological feasibility does not always imply actual feasibility because access can be restricted by governments, by service providers, and other entities. In the digital library utopia that I have sketched over the last few hundred words, by definition pretty much everything (in library collections) would be available pretty much everywhere. Access to the networked library would be essentially the same in London, England, London, Ontario, and on the London Bridge in Lake Havasu, Arizona. The geographic location of services and terminals is of at most secondary importance in the networked world.

This raises a question that is fundamental to the inquiry that motivates this paper: Of what importance (if any) is the geographic location of libraries to the performance of library functions in an environment where the vast majority of access to and use of collections takes place over the network? To the extent that the

location of the library still matters in a consequential way, the brick-and-mortar that anchor that location will also matter.

It turns out that the list of library activities and functions for which location matters is a long one, including local public goods (an economic term of art that I will define shortly); service as an agglomeration node (another economic term of art to be defined) for several activities that are essential to research universities; a site for special collections and museum-like functions; and a site for research and learning about scholarly materials that have a significant tactile component. I discuss each of these functions and their location requirements in turn.

The term “public good” has a set of technical meanings in economics, the most important of which is nonrivalry in consumption.<sup>14</sup> Facts and ideas are pure public goods – adding to the number of people who know them or who are aware of them can be done without reducing identical knowledge possessed by others. Local public goods, sometimes called “club goods,” act as public goods for a limited population. A swim club is a good example. So, too, is the classical academic library, which makes a physical collection available to members of the community. Technically, there can be rivalry in the case where more than one member of the community wants to read the same book at the same time, but except for textbooks in large courses, such phenomena are rare. It makes sense to think about the collection as a whole as a single local public good, one that produces value for those lucky patrons that are members of the relevant academic institution and situated nearby. It is because print collections are differentially valuable to local users that academic libraries are such an important component of university investment and such a salient aspect of competition among universities. Libraries attract faculty and students, and better libraries attract better faculty and students.

In the networked world there would be no differential access to the “ordinary” (i.e., not special) library collections. However, there are any number of other important local public goods, including studios, virtual reality caves, 3-D printers, and other elements of current information technology. All of these act much as books once did in the economy of the university. They are expensive and useful, too

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<sup>14</sup> See Paul A. Samuelson, *The Pure Theory of Public Expenditure*, 36 THE REV. OF ECON. & STAT. 4, 387-389 (1954); Paul N. Courant & Elisabeth A. Jones, *Scholarly Publication as an Economic Public Good*, in GETTING THE WORD OUT: ACADEMIC LIBRARIES AS SCHOLARLY PUBLISHERS 17-43 (Maria Bonn & Mike Furlough ed., 2015).

expensive for individuals or even individual departments to each have their own. Thus, it makes economic sense to share them across the academic community. In many cases, an obvious place to house them is in the library, which is usually centrally located and owned by the campus as a whole. Once such equipment is present in the library, experts who know how to use it and teach its use cluster nearby. This creates an agglomeration node for related activities, just as traditional library collections, conjoined with subject specialists, have created distinct subject-based neighborhoods within the library.

More generally, economies of agglomeration occur when the co-location of several activities decreases the average cost (or increases the amounts produced) of those activities. Academic departments exhibit agglomeration economies – chemists benefit from having chemists down the hall. So, too, librarians’ work is enhanced by having other librarians nearby, as is the work of scholars and students who draw upon librarians’ expertise, as well as each other’s interests and expertise. The library also has a special status within the university. It is neutral territory, and thus a natural site for interdepartmental and interdisciplinary interaction that avoids concerns about who owns the space or the equipment or the project. It’s often the best on-campus “office” available to students. Once the students are there, it makes sense to have experts in the use of information and information technology (librarians) in the same place. The principal agglomeration node in the pre-networked world was the collection. Once the space for the collection and its uses exists, however, it can and does adapt to a plethora of related functions that are enhanced by mutual propinquity. Note that budgetary challenges may limit the range of services that the library provides; but it will still make sense for services that are subject to agglomeration economies of the kind of described here to be performed in the library.

Moreover, there will continue to be parts of the traditional library collection that require physical curation and the expertise of librarians. Most important here are special collections. Almost all academic libraries have holdings of old and rare books (and often, maps, prints and manuscripts) that are in some combination fragile, historically significant, and likely to be objects of scholarly study. These works need expert care in order to survive, and their academic value is much enhanced by being in the proximity of librarians who have expertise in their care and interpretation. To be sure, the volume of special collections is generally small relative to the regular collection that fills the stacks, but the quality of the brick-and-mortar library required to use it well is higher than that for the average of the

collection. The amount of space required per volume is greater, and many works require special security and climate control, both of which are most easily provided at one location on a campus. Because special collections often draw a substantial audience and are of general interest, the natural place to house them is at the center of campus, where the library usually sits.

Physical collections and special collections can be of great value in teaching. Today's undergraduates grew up in the era of e-resources, and there is often nothing in their experience that allows them to connect the electronic resources that they use with the original works whence those sources derive. Effective scholarly method requires that the provenance of studies and cited works be known. Students can benefit from learning the history of scholarly practice (including the history of the book) and in order to do so, actual books – including some rare ones – are valuable links in the chain of understanding.<sup>15</sup>

Finally, in today's pre-utopian world, there are the millions of volumes of in-copyright works – many of them in HathiTrust and other academic libraries in digital form that can only be used in physical form due to copyright. These works and their contents can be accessed only through a brick-and-mortar library that holds the physical collection. Such holdings do not have to be at the center of campus in the main library buildings, as long as a convenient site is available to page the books for patron use. But climate-controlled stack space for the working collection, with reasonably good access for users, will be an essential requirement for successful academic libraries for decades to come, unless arrangements can be made such that digitized copies can be used as the principal working copies for scholarly purposes, as sketched in the "utopian" scheme discussed above. It's also worth noting that even in the utopian scheme, there would be good reason for collective and approximately complete holdings of the contents of academic libraries in physical form. Such a collection would assure (insofar as possible) the ability to connect digitized texts with the originals, and to study the originals as artifacts when scholarly purposes require such study, as will surely happen from time to time. The number of physical copies needed world-wide to secure the scholarly and cultural record in their original forms

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<sup>15</sup> See Paul N. Courant, *Scholarship: The Wave of the Future in the Digital Age*, in *THE TOWER AND THE CLOUD: HIGHER EDUCATION IN THE AGE OF CLOUD COMPUTING 202-211* (Richard N. Katz, ed., 2008), <http://www.educause.edu/research-and-publications/books/tower-and-cloud> [<https://perma.cc/35HR-9PBT>] (discussing an extended treatment of the importance of the term "scholarly literacy" in the digital age).

would be much smaller than the current holdings, which must serve as the primary collections for scholarship and teaching at the local campuses served by research libraries.

## VI. CONCLUDING NOTES

The literal meaning of “library” is “a place set apart to contain books.”<sup>16</sup> In the foreseeable future (but plausibly a fairly distant future) the importance of the on-campus physical library as a place to keep, find, and use books will be significantly reduced in importance for the “ordinary” books and serials that comprise the bulk of research collections, as digital means of accessing these works grow in importance and convenience. Even as the quantity of physical books held by research libraries falls (and as the research libraries come to share print archives of works that are available in digital form) there will still be many research libraries that will hold millions of less ordinary books. Brick-and-mortar libraries will keep the rain off and the humidity low.

We have seen in this discussion that libraries serve as the site for many activities that are essential to the successful production of scholarship, learning and teaching that are not directly connected to the traditional role of storing books and other physical media. The library provides a place to use emerging technologies, and a locus of expertise relevant to obtaining and using those technologies, including new information technologies. Librarians continue, and will continue, to provide expertise relevant to using scholarly collections. Their command over the use of networked collections is likely to be increasingly important, as the sources and curation of such collections are at distant geographic remove from the patrons and the users. Librarians will continue to play a vital intermediary role between the collection (including networked and virtual collections) and the patrons.

Libraries – the place where the books are – are now the place that houses the librarians and the functions that they perform. Those functions, like the collection-based functions of the past (and, nontrivially, the future, even in a networked world) provide natural nodes for agglomeration of a host of activities that are essential to academic work. Libraries are where the librarians, and those that they

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<sup>16</sup> OXFORD DICTIONARY OF ENG., <https://en.oxforddictionaries.com/definition/library> [<https://perma.cc/GCZ5-55YA>].

serve are, and we can expect them to continue to draw a crowd for the foreseeable future.