The Choice for Learning[1]

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We are building conventional library space without making the paradigm shift our digital environment requires. The chief obstacles to change lie in our conception of readers as information consumers, in our allegiance to library operations as the drivers of library design, and in the choice made between foundational and non-foundational views of knowledge. We have the choice of focusing on the delivery of electronic information and abandoning many of our claims on physical space or of designing library space for learning. The latter choice is illustrated by a thought experiment involving the reference desk.

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There is something magical about a digital library. Like Aladdin, we can with a motion of the hand conjure a whole library into life. The reader can invoke this marvelous library anytime and virtually anywhere. Why would one want anything different, anything less magical? With such digital libraries at our command, one has to ask why we might continue to build libraries with bricks and mortar. This is no inconsequential question. In the United States alone and among only colleges and universities, we invest every year nearly a half-billion dollars annually in new and renovated library space.[2]

In this essay, I consider the fundamental choice we must make if this huge investment in physical library space is to pay rich dividends. My observations apply only to academic libraries and derive only from experience with higher education in the United States. My argument starts with a consideration of what values physical library space creates. Not surprisingly, these are cultural values that are deeply challenged by the magic of digital libraries. I turn second to a review of our experience of building academic libraries in the United States over the last decade. I argue that we continue to build largely conventional libraries not fully engaged in the paradigm shift that our digital environment requires. Third, I suggest that the chief obstacles to a paradigm shift in the architectural design of academic libraries are largely unrecognized and lie in our idea of readers as information consumers and in our allegiance to library operations as the chief driver of library design. I also argue that the unrecognized choice we make between foundational and non-foundational views of knowledge is a major obstacle to good library space design. Fourth and last, I describe two choices we have in countering these obstacles to a paradigm shift. One choice is to focus primarily on the delivery of electronic information and abandon many of our claims on physical space. This choice is illustrated by the example of space planning at a medical library. The second choice involves designing library space for learning and is illustrated by a thought experiment involving an archetypal feature of libraries—the reference desk. I show that making a choice between profoundly different ideas of knowledge and of the business of libraries can decisively change the design of library space and of library services.

Space for Immersion Learning

Let us first consider what values physical library space creates and how those values are challenged by information technology. To do this, I ask you to bring a picture to mind. Imagine a mother sitting with her young child in her lap. Let us imagine the mother is reading a book to her child just before bedtime. The book deals

with the fearsome aspects of the dark. The pictures and the story line acknowledge the existence of monsters, but at the same time they suggest monsters are more likely to occasion adventure than fright.[3] This message is powerfully reinforced by the safety the child feels in the mother's embrace. What is happening here is learning by immersion, where every element in the immediate environment contributes powerfully to learning. Every human first learns to learn by immersion, wrapped within a place and within a body where every sensation has an embodied say. Such all-at-once integrative learning empowers a child to learn language, for instance—a veritable act of genius. Only later, when learning fragments into one-at-a-time lessons, does school make so many dull.[4]

The capability for immersion learning changes as we grow. Going to college, for instance, reframes a person's life; and the totality of the student's life on campus once more prompts immersion learning. Traditional library design, with its immensely powerful monumental statements, is one element in the attempt to create a residential environment—an immersion environment—that provides, like the mother's embrace of her child, a safe haven for exploring the uncertainties of the adult world. While there are many ways to express this design, the association of learning with religion has been a particularly powerful way to create a safe environment for learning. For instance, when in the middle of the nineteenth century Yale University built its first library building, it designed it as a church (Fig. 1). And when in the 1920s it was necessary to move to a much larger building, Yale again chose to build its magnificent Sterling Memorial Library in the idiom of a church (Fig. 2).[5] Drawing on the widely understood design elements of a church, these library buildings manifest two key cognitive values that we know draw people powerfully to space: *coherence*, or the ease with which a space can be organized cognitively, and *legibility*, or the perceived ease of use. Drawing on the spiritual associations of church architecture, these buildings also manifest two other cognitive values that draw people to space, *complexity*, or the perceived capacity of the space to occupy interest and stimulate activity, and *mystery*, or the perception that entering the setting will lead to increased learning, interaction, or interest.[6]

Figure 1
Yale College Library, 1880. Pictures of Dwight Hall, 1846–1937. Manuscripts and Archives, Yale University Library

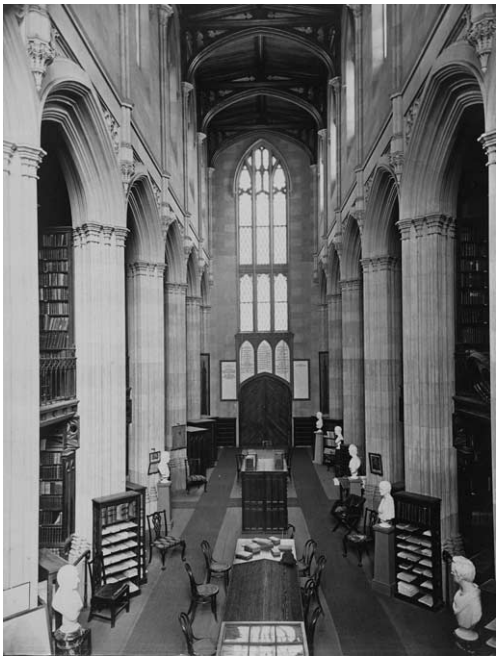
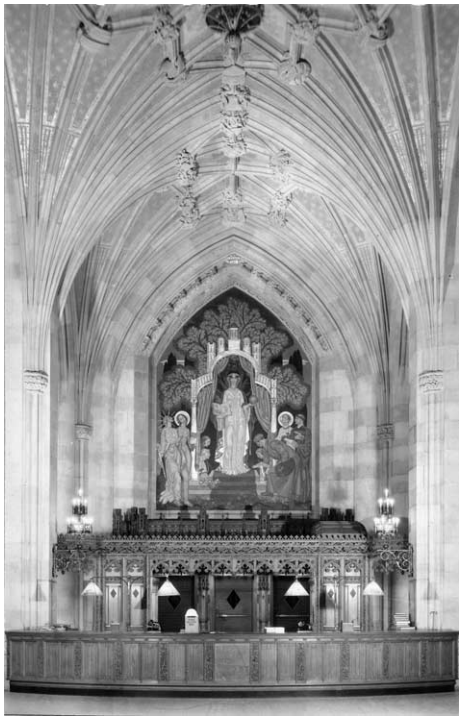


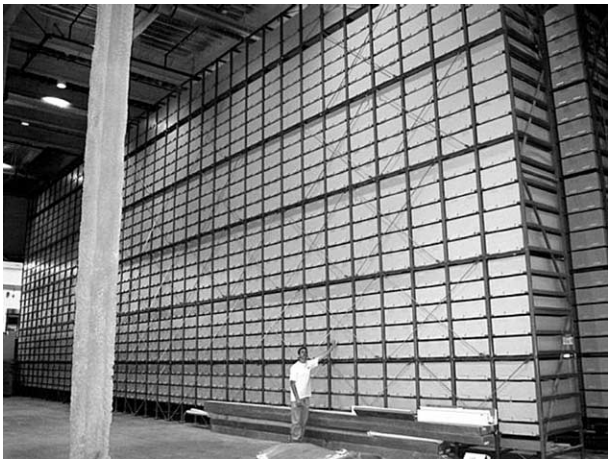
Figure 2
Sterling Memorial Library Circulation Desk. Pictures of Sterling Memorial Library, 1927–1960. Manuscripts and Archives Yale University Library



It is hard to imagine building a library like these today.[7] The first thing working against such designs is the secularization of society and the power for ordering our daily lives we have vested in digital technology. Today it is the digital drive and its associated display that promise coherence, legibility, complexity, and mystery (or adventure, as I prefer to say). Academic libraries now properly celebrate the culture of information technology as much as or more than the culture of the book. And even where we still rely on large collections of print material, we are increasingly designing shelving space using the idiom not of churches but of the warehouse. The marriage of form and function in the score or more of high-density shelving facilities built in the United States over the last twenty years is striking, even breathtaking, but there is no mistaking the design intention to exclude readers from these shelves (Fig. 3).

A second factor making traditional library space design improbable arises from one of the chief values we create through digital information technology: dramatic reductions in the time required for information retrieval. Ask readers what they most value about the digital library, and the answer will usually be its convenience. Readers can now do ''library work''

Figure 3
Lied Automated Storage and Retrieval. Lied Library, University of Nevada at Las Vegas



in virtually any environment that is convenient for them. The automation of library services and the delivery of digital information resources acknowledge in ways never before possible the value of the reader's time. Indeed, the chief value the digital library delivers is the gift of time. Where digital information is available, it is hard to understand what there is in library space, as traditionally designed, to temp readers to give up these productivity gains and once again invest their time in coming physically to the library.[8]

A third challenge to traditional library space design lies in the way we use digital technology to create virtual environments as compelling alternatives to the physical environment. This substitution behavior happens everywhere, but perhaps most commonly in the way people walk about with cell phones pressed to their ears or talking into headsets. The rivalry between virtual and real spaces is evident in the announcements required at the beginning of concerts, where audience members are asked to turn off cell phones and pagers—asked, that is, to commit single-mindedly and without disturbance to others to the physical reality of the concert. The power we have to create virtual environments is especially manifest in computer games, where we are invited to create whole cities and even entire civilizations.[9] More intimately, it is now possible to date a virtual girl friend named Vivienne. You can take her to the movies, and you can even marry her—though she comes with a virtual mother-in-law who "calls in the middle of the night on your cell phone to ask where you are and whether you have been treating her daughter right."[10] We all have heard stories of hackers who isolate themselves in their rooms and live their lives primarily in virtual reality.[11] Few of us wish so thoroughly to abandon the physical world for the virtual one, but we regularly demand the ability to create virtual communities in listservs and games and to live out our daily lives in blogs. Still more commonly, we insist on the ability to work with colleagues in virtual space, without reference to their actual physical location. "Bill Gates believes that the next great leap forward in computing terms will engineer social change as barriers among people, systems and information disappear. He touts 'Longhorn,' the next edition of Windows, as a collaboration framework, rather than a computing platform."[12] What we see in all of these behaviors, in one degree or another, is the desire to build a virtual environment robust enough to substitute for a physical environment. We want digits to do what we formerly used bricks and mortar for—providing environments in which we might immerse ourselves for learning and communal action.

These three factors—the substitution of digital culture for the culture of the book, the convenience or productivity gains available through digital information, and the ability to build and live within digital environments—pose powerful challenges to the building of physical library space. Yet we continue, without pause, to build such space. Why?

Part of the answer lies in the fact that we are a social species and hunger for places to come together for conversation and learning, activities that have intrinsic value for us. Ray Oldenburg has described the drive for such spaces in his well-known book, *The Great Good Place: Cafés, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts and How They Get You Through The Day.* The director of one public library has expressly used Oldenburg's "great good place" phrase to describe the aspiration that informs her building plans.[13] Her ambition echoes a widespread concern to create powerful public spaces, evident in the work of the Project for Public Spaces, a non-profit organization (www.pps.org) that helps communities to understand the opportunities inherent in the design of their public spaces and buildings. Phil Myrick, assistant vice president of Project for Public Spaces, observes of libraries that "information is easy to come by these days; good public spaces are not. Increasingly, the stature of libraries will depend on the very fact that they are physical places that are centrally located in almost every neighborhood."[14]

Academic libraries, like public libraries, benefit from central location. And we instinctively feel their success as spaces is best measured by heavy use by students. In one notable instance, an institution's president talked about the three goals for a hallmark library project on his campus. Significant increase in student use of the space was *not* one of these goals, but when it happened—"as some form of serendipity"—the president said the project had "worked out brilliantly. You go to the library now, and it is a very active and alive place, and I think that may have been the singularly most important outcome of our project" (*Libraries Designed for Learning*, pp. 36–37). Like this university president, we cling with sometimes little conscious planning effort to physical library space as an instrument for shaping the reader's environment. In this way, we continue to insist that libraries should provide immersion learning for the communities they serve.

A Decade of Experience Building Academic Library Space

What purposes do we avow in building and renovating academic libraries in the United States, and how well aligned are these purposes with our enduring hunger for strong physical environments—immersion environments—for learning?

We can answer that question by looking at what motivated academic library projects over the last decade and at the outcomes of those projects. We know about academic libraries built between 1992 and 2002 from a report published by the Council on Library and Information Resources and from an excellent pair of articles by Harold Shill and Shawn Tonner.[15] While there is some overlap between these studies, the CLIR

report is concerned with the factors that motivated academic library building and with planning methods; it focuses particularly on libraries as learning space. By contrast, the Shill and Tonner articles focus on what was built and changes in library use attributable to new investments in library space.

In considering what was built, and why, a few major trends are worth attention.

- Remarkably in a digital age, one of the strongest motivators for new academic library construction in the 1990s was the need to provide shelving for paper-based collections. Additional shelving was needed for poorly housed material accumulated over previous decades as well as for the continued robust print-on-paper output of publishers. Just as remarkably, however, when library directors and chief academic officers were asked whether they expected shelving needs to drive library space planning in the future, they expressed some conviction—or at least the hope—that they would not (see "Creating a Better Place," pp. 453–456, and *Libraries Designed for Learning*, pp. 10–13).

- If the concern with shelving looked backward, the concern to fit libraries with digital technology looked forward. Libraries were equipped for ubiquitous online communication with cables, wireless devices, and rooms for routers and servers. Data ports, phone lines, and electrical service were generously supplied everywhere—along the walls, in the floors, in work tables and carrels, near lounge seating, and in food service areas (see "Creating a Better Place," pp. 445–447, 451–453). Wireless technology matured during the decade, and libraries were often chosen as early implementation sites. Indeed, libraries demonstrated an impressive ability to remain current in a rapidly changing telecommunications infrastructure.

- As both the complexity of digital information and readers' decided preference for such material became evident, many librarians and faculty responded by asserting an institution-wide responsibility for cultivating information literacy.[16] This responsibility drove the academic library's involvement in instruction to new prominence. These concerns found architectural expression in electronic classrooms and in service spaces named information commons—spaces rarely encountered in libraries before the 1990s. Both spawned their own professional literature.[17]

- Snack bars and cyber cafés are now commonly included in renovation and new library projects. While some resistance to food services is still found, it is rapidly fading as the role of food in the social dimension of learning is acknowledged (see "Creating a Better Place," p. 457, and *Libraries Designed for Learning*, pp. 18–19).

- Group study space became a common feature of academic libraries. This is space that students use for collaborative learning; it responds to students' preference for "learning by doing" and other active learning behaviors. It is not designed to support the delivery of one or another library service; it is space where students are neither served nor taught, but where they take command of their own learning. While it would be hard to find any academic library project in the United States that does not now provide group study space, it would be equally hard to find a library that offers enough of such space (see "Creating a Better Place," p. 450–451, and *Libraries Designed for Learning*, pp. 16–18).

What character did libraries designed with these features take on, and how was their success judged? Interviews with those responsible for planning library projects in the 1990s indicate high levels of satisfaction with their outcomes, especially as evident in increased student use of the library. Shill and Tonner have shown that "the great majority of new and improved libraries have experienced sustained increases in usage of the physical facility following project completion. In addition, some libraries have experienced profound increases in usage, with 25.6 percent of survey participants reporting postproject usage gains exceeding 100 percent. In short, a high quality building does make a difference, and students continue to use an improved facility even after the novelty of a new library has worn off" ("Does the Building Still Matter," p. 149).

Gratifying as this success is, and beautiful as some of the libraries are, one still wonders how adequately contemporary library design is responding to changes in the academic environment where there is abundant evidence of fundamental, indeed revolutionary change in information technology, in student learning behavior, and in pedagogy.[18] Does contemporary library design match these revolutionary changes? Do an up-to-the minute telecommunications infrastructure, abundant computers, information commons and electronic classrooms, group study spaces, and even the introduction of once-forbidden food services represent a commensurate revolution in our thinking about library design?

Arguably not. Indeed, when a number of chief academic officers and library directors were asked how innovative they intended to be, many of them said the projects they guided had intentionally aimed at traditional needs and were designed to affirm the traditional identity of the library. The library director at an institution that wished to be at the cutting edge of information technology reported that "in a lot of ways, the building [itself] is a very traditional library structure.... They just put a lot of wire and a lot of technological capability into a structure that is largely a very traditional building." Another library director said, "we built a very traditional building. We sought to provide comfort, quiet, light ... and convenience," while still another library director commented that his aggressive design for information technology was meant to change perceptions not of library space but of the library as a service organization (see *Libraries Designed for Learning*, pp. 23–25). This judgment of individuals directly involved in projects of the 1990s finds an echo in the testimony of a New Zealand librarian, who visited the United States hoping to find innovations in library design that might stimulate thinking about his own library. "We looked for libraries that were really forward thinking and had, as a result of that thinking, produced advanced and exciting buildings. By and large we failed to find them.... New thinking at the planning stages rarely resulted in concrete evidence of a new manner of providing services. What we saw was mostly traditional dressed as new."[19]

In explaining this outcome, one librarian commented that "facilities are very expensive. It's hard to figure out how to experiment.... We're going to be fairly conservative about that, [especially as] changes in curriculum ... are fairly conservative, fairly slow to happen." Another director made the same point in affirming "there doesn't seem to have been a paradigm

shift yet [in library space design]. It seems to me that higher education in general does not seem to have paradigm shifts very often. So since other things change so slowly, it may be only natural that libraries do'' (*Libraries Designed for Learning*, pp. 28–29).

However explained, it is clear that the hand of tradition rests heavy on library space design. While we have introduced a number of new design elements that are responsive to changes in our service, teaching, and learning environments, those elements have had—with few exceptions—fairly superficial impact on design fundamentals. We have primarily worked to reaffirm traditional values and produced libraries where the ''traditional [is] dressed as new.'' We have mostly evaded the three challenges to traditional design described above: favoring digital culture over the culture of the book, valuing reader's time, and building and living within digital environments. Although we continue to automate library operations, our recent past provides little guidance for creating a new paradigm for the design of library space—a paradigm that is fully responsive to the revolutionary change that surrounds us. Creating a new paradigm for academic library space lies before us as a pressing task.[20]

Recognizing Obstacles to a Paradigm Shift

I turn next to the central obstacles to developing a new paradigm for library space. Three of them are the more formidable because they are largely unrecognized as obstacles. The first two are a pair of closely related issues: our conception of readers as information consumers and our preoccupation with the delivery of library services. The third obstacle is even more fundamental, having to do with the way we conceive of knowledge and learning.

Information Consumption and Library Service Delivery as Obstacles

We live in what we call the Information Age, and over the last generation we have seen much new attention given to information as a commodity in trade. Debates about national and international copyright laws and about the protection of the public domain have again become lively, not least because of the huge financial interests involved. The ability to custom tailor information and deliver it directly to readers opens immense new business opportunities. It is no wonder, in this environment, that we think of readers as information consumers. Indeed, librarians are now told by one of the most respected organizations in our profession that ''the ultimate question of life, the universe and everything is: How do we together, as a community of libraries and allied organizations, move our trusted circle [i.e., libraries] closer to information consumers at the level of *their* need?''[21]

This affirmation carries a partial truth too far. For readers in institutions of higher education are only secondarily information consumers. We really must remember that people at colleges and universities define themselves, first and foremost, as students and faculty. They have come to these institutions for the purposes of learning. Information use—information consumption, if you must—is a critically important element in learning, but to think of those served by academic libraries primarily as information consumers rather than as learners is to mistake means for ends. The ''ultimate question of life'' regarding academic library space is about learning and not about information consumption, because in truth the latter is only a means to the former.

If we so often go wrong with this ultimate issue—the definition of readers—it is hardly surprising that we get design priorities wrong. Because librarianship is a service profession, we customarily think of the design of library space as turning on the best delivery of library services. This made some sense in an era when services could be delivered only in physical space. Now that they can be delivered in virtual space, it is surely time to re-examine the primacy of service issues in library space design. The evidence is that we have not yet done so. The dominance of the service culture in current library space planning is strikingly evident in how academic library directors characterize their planning methods. Describing 240 construction and renovation projects completed between 1992 and 2001, these directors reported conducting systematic evaluations of library operations in 85 percent of the cases, while doing systematic assessments of student learning and faculty teaching behaviors in only 41 percent and 31 percent of the cases, respectively. The latter two figures are probably overstated. Follow-up interviews with a number of library directors revealed that even when they reported doing a systematic assessment of modes of student learning, they had in most cases simply surveyed student preferences regarding group study space and types of seating (see *Libraries Designed for Learning*, pp. 20–22, 33–36).

The knowledge base that guides library space planning is thus poorly balanced, tilted heavily toward library operations and away from systematic knowledge of how students learn. A case in point is the redesign of the learning commons at one large North American research library. While that library's planning principles invoke the social dimension of learning, the diversity of learner needs, and the wish to foster self-sufficiency and lifelong learning, the information on which planning actually drew was operational: library program and service descriptions and statistics, inventories of public computing facilities in the library and of current staff spaces, and the results from a user survey.[22]

The conception of readers as information consumers and of library space as service space is deeply rooted among librarians. To question these established paradigms is, it would seem, to question the verities of our profession. Challenging these verities will surely leave us feeling deeply uncertain and uncomfortable, just as faculty are who must confront the old teaching-centered paradigm of higher education and move to a new learner-centered paradigm. I argue that librarians and library designers must now join faculty in making a parallel paradigm shift. We need to understand that the success of the academic library is best measured not by the frequency and ease of library use but by the learning that results from that use. Our purpose is not to circulate books, but to ensure that the circulation of knowledge produces learning. To restate our purpose in this way is to launch a paradigm shift in library space design based not in a service culture but in a learning ethos.

Traditional Concepts of Knowledge as an Obstacle

To say that library space should be designed primarily for learning and not primarily for service is the first step in building a new paradigm. The second step is to understand how students learn and to incorporate that understanding into our design work. Taking this second step is likely to be as wrenching as the first because it requires that we confront the deep-seated bias favoring teacher-centered learning in higher education and

substitute for it a learner-centered paradigm. The higher education community in the United States has made a beginning toward this paradigm change, but we have a long way to go. This is so because the change challenges our fundamental allegiance to what is called a foundational view of knowledge.

A foundational (or cognitive) view of knowledge holds that "knowledge is an entity formalized by the individual mind and verified against reality."[23] Knowledge in this sense is founded in external reality as engaged by individual intelligence. Foundational views of knowledge celebrate the accomplishments of the individual scholar; they ratify the authority over knowledge of the teacher. Foundational views of knowledge drive much PhD education, inform the conduct of academic departments, dominate academic reward systems, and shape almost all of the structures of prestige in academe. Little wonder that higher education has for so long been dominated by teacher-centered behaviors, including—as we will see—the design of library space.

Non-foundational views of knowledge hold, by contrast, that knowledge is constructed by people acting within communities. "People construct knowledge working together in groups, interdependently. All knowledge is therefore the 'property' not of an individual person but of some community or other, the community that constructed it in the language spoken by the members of that community." (Bruffee, pp. 294–295) Non-foundational views of knowledge are most frequently met, in higher education, in the research laboratories of scientists. As John Seely Brown observes, it is

> through participation in communities that deep learning occurs. People don't learn to become physicists by memorizing formulas; rather it's the implicit practices that matter most. Indeed, knowing only the explicit, mouthing the formulas, is exactly what gives an outsider away. Insiders know more. By coming to inhabit the relevant community, they get to know not just the 'standard' answers, but the real questions, sensibilities, and aesthetics, and why they matter.

The task of the university is to make these communities, and especially the real questions and sensibilities of those communities, open and accessible to those who want to learn. It is

> the learning communities that universities establish and nurture that remove them from the realm of a delivery service, or from being mere traffickers of information, to [become instead] knowledge creators. An on-campus social learning environment offers exposure to multiple communities of scholars and practices, giving students broad access to people from different fields, backgrounds, and expectations, as well as opportunities for intensive study, all of which combine to form a creative tension that spawns new ideas, perspectives, and knowledge.[24]

Meeting the Obstacles to a Paradigm Shift in Library Space Design

I believe we might reasonably make one of two fundamentally different choices in meeting the obstacles just described to a paradigm shift in the design of library space. The first involves embracing a largely virtual future for academic libraries and abandoning most of our claims on bricks and mortar space for readers. The second requires that we make good our claims for such space by self-consciously and resolutely designing it for learning.

Embracing the Virtual Library

We might well embrace a future where "the driving philosophy for the design of the library [is] to focus on electronic access to scholarly information [reflecting the fact that]. . .the evolution of scholarly information [is] leading toward exponentially expanded electronic access to a wide variety of sources.. . . Electronic access to current and historical information *must* have priority over the housing of historic physical volumes."[25] Strongly present in this clarion call for a digital future is the idea of the library as a service operation primarily supporting information use–information consumption. In time, as the availability of electronic resources matures across all disciplines, we might reasonably abandon most of our physical space to other claimants (and there will be no shortage of them, given the central campus location of most academic libraries) and concentrate instead on the digital delivery of information and information services.[26]

There are in fact a few exemplars of designs based on a thorough-going embrace of a virtual future for libraries. One arises from academic medical libraries, which are often harbingers of things to come for other libraries. The Welch Medical Library at Johns Hopkins University is particularly pertinent, as its point of departure for planning is the belief that by 2015 all of the information resources needed by clinicians and medical researchers will be available in digital form. This conception of the future drives a shift of library staff and services out of the main library building to a number of what are called touchdown suites, located in various clinical and research buildings throughout the medical campus. The planning model assumes there will be very little walk-in demand for library services. Instead, library staff—called informationalists—work in and from these touchdown suites as consultants, collaborators, and trainers. A newly built, centrally located Knowledge Center, will serve as a support base for library staff and as a central facility for the library's educational program in information management. The original library building, no longer at the center of the medical campus, will support the history of medicine program with print and archival materials; the building will otherwise become a place to confer on the management of information in medicine. The vision for the Welch Medical Library is that in time it will not be a single place, embodied in an imposing building, but will rather be a network of places, a set of nodes for collaboration with hubs that support the networked activities. The library will physically be a network, much as is the information technology it supports.[27]

Designing Libraries for Learning

This call to a largely virtual future is powerful, not least because it is right about so much of what will happen to information use and is well suited for graduate professional education. But I regard it as a siren's call when applied to the broader learning environment of undergraduate, liberal arts education. One hears an alternative to this siren's call—a different choice, in fact, about library design—from Steven Foote, an architect who has designed a number of libraries for liberal arts colleges. He acknowledges the growing importance of digital information. But he comments that

> from an architect's perspective, the sleeping giant [among the trends driving academic library design is that]. . .relating to the rapidly growing requirements for collaborative learning space. As we trace the history of how to accommodate readers in libraries, we are struck by the new paradigms that apply.. . . It is apparent that changes are upon us and that the old programmatic models are no longer adequate.[28]

Foote here argues that the "ultimate question" in library space design is not about information consumption but about collaborative learning. This is an argument that sets right the

relationship between ends and means, between learning and information.

If one focuses on learning, one must engage with the reality that learning "occurs *not* as a response to teaching, but rather as a result of a social framework that fosters learning." (Brown, p. 65) Students known this and often express strong preferences for learning by doing, for learning that is socially situated (as in residential colleges), and for collaborative learning.[29] Library space design has in recent years recognized this preference by providing group study space. But does this fully meet our obligation to make libraries a home for learning communities? Are group study spaces an adequate affirmation in the design of library space of a non-foundational view of knowledge? What will it take to design library space where readers can distance themselves from the realm primarily of service delivery, from being mere traffickers in information, to become instead creators of knowledge?

As we have only recently begun to ask this question, it is not surprising that we lack confident answers or a set of exemplary buildings. We are just beginning to make a paradigm shift. Foote has identified several design practices that will foster collaborative learning, including

- encouraging a sense among readers that they "own" the library space they use;
- specifying tables (e.g., round tables) and other furniture that is designed for collaborative work;
- recognizing that library space and especially furniture will be used in different ways at different times during the day and night;
- attending to the acoustical needs of spaces that change with changes in use;
- providing ample space with environmental characteristics (e.g., natural light) that encourage active, collaborative learning; and
- experimenting with different ideas for accommodating learning in each space we design. (See Foote pp. 55–56)

While generalizations such as these about a new paradigm for library space design are useful, specific examples of innovative design at individual institutions may be even more powerful in driving paradigm change. This is especially true as regards the way an institution frames the issues it wants to address in designing a new or renovated library and the processes it uses to address those issues. Architects say they need great clients if they are to produce great buildings. The fact is that a completed project can never be better than the process used to bring together all the stakeholders and enable them to ask and answer the key questions about their library.[30] Library planning at Duke University, at the medical campus of Johns Hopkins University, at the Ohio State University, and at Sewanee: The University of the South exemplify forward-looking thinking and the effort to find a new paradigm for library space.[31]

To illustrate still more particularly the kind of design process that can free us from being "mere traffickers in information" and move us toward designs rooted in collaborative learning, I here propose a modest thought experiment. It will focus on just one archetypal element in library design, the reference desk. Reference desks have seen remarkably little change, even as so much else in libraries has changed dramatically.[32] Our thought experiment will explore possible changes, moving us from a design that is today almost universally used to alternatives that are just beginning to be imagined.

Bring first to mind a picture of the academic library reference desk as it is most commonly designed in the United States (Fig. 4). It is placed in an area of high reader traffic in a room of imposing size. It is customarily designed to have a visual massiveness appropriate to these surroundings. It may stand against a wall or be an island amid a surrounding space. It will certainly have a large work area for transactions that are conducted with the reader standing before the desk; it may also have lower work surfaces that permit the reader to sit. Almost always, the reader and librarian will be separated from one another by the desk, whatever its height. Rarely is the reader asked to join the librarian on the side of the desk where the librarian has access to a set of ready reference tools, the mastery of which marks the authority of the librarian. Usually (but not always), the librarian remains behind the desk and directs the reader elsewhere in the room or the library building. This design signals to the reader that the librarian behind the desk is ready to respond to all questions. The design asserts and validates the authority of the librarian over knowledge. This design positions the reader in the library in much the same way a customer is positioned in a fast-food restaurant (though with, it must be said, more sustaining results). Both reader and librarian are traffickers in information.

Objecting that this characterization of typical reference desk design is too negative, one might instead say that the librarian in this situation is often providing instructional help, guiding the reader to master the complexity of the information world. Even so described, one has to say that traditional reference desk design affirms the centrality of teaching and the authority of the teacher over knowledge. The design strongly affirms a foundational view of knowledge. There is nothing in this design and the reference service it supports to suggest that the librarian and reader are or even could be collaborators in learning. That we

Figure 4
Reference Desk. William & Anita Newman Library. Baruch College, City University of New York

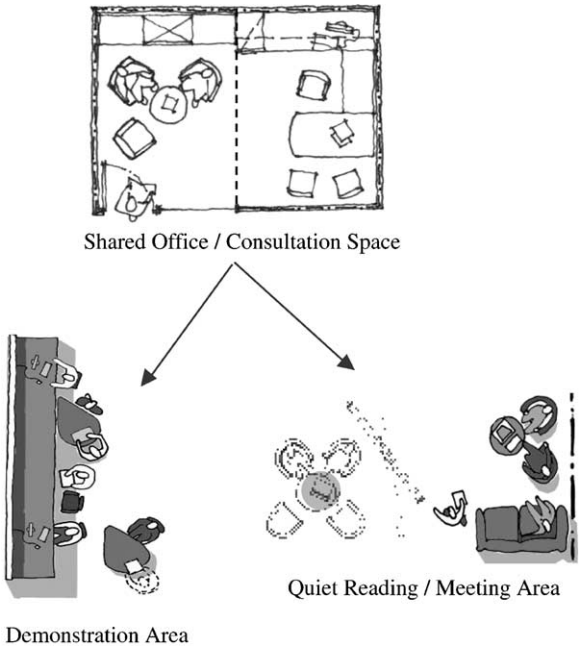
customarily design reference desks in a way so directly opposed to collaboration can hardly be surprising. This customary design mirrors the design of space elsewhere on campus, especially in classrooms and offices. It asserts the primacy of the teacher, the authority of the teacher over knowledge, and the role of the student as consumer rather than as collaborator.

Now picture an alternative design that is meant to relax somewhat the barrier between reader and librarian. This desk lowers the work surface and as much as possible removes the vertical visual barrier created in traditional design (Fig. 5). What remains is a horizontal work surface that might, or might not, be used as a shared workspace. The provision and placement of a chair for the reader and the deployment of the computer screen and input devices will indicate the degree to which the reader and librarian are meant truly to share this space. However these elements are arrayed, there is no question that this is primarily the librarian's workspace and the reader is a visitor. This and the presence of the librarian's work tools—especially ready reference works—reinforce the librarian's command over this space and authority over the exchange of information that happens here. This is still a place for trafficking in information, though certainly a more welcoming place than that produced by typical monumental designs.

There are many exemplars of these first two types of reference desk design, so we need call little on our powers of imagination in thinking about them. A third design exists, so far as I am aware, only in architectural floor plans and in the mind's eye of some librarians. A bit more imagination is therefore necessary to see this third option, exemplified by what the Welch Medical Library calls touchdown suites (Fig. 6). The first thing to emphasize about these spaces is that they are not in the library building at all. As we have seen, this removal from conventional library space is enabled by the existence in digital form of virtually all of the information resources needed by clinicians, medical researchers, and patients. The suites can be used by the academic units they are near when they are not being used by library staff. The principal features of the suites are a workstation designed for collaboration (including video conferencing) and

Figure 5
Non-Monumental Reference Desk. O'Shaughnessy-Frey Library. University of St. Thomas

Figure 6
Touchdown Suite. William H. Welch Medical Library Master Plan, May 2002. Johns Hopkins Medical Institutions



lounge furniture for small meetings and consultation. Every element in this design is meant to foster collaboration. And to the extent there is any assertion of ownership in these suites, it is the librarian, not the reader, who is the visitor in these workspaces located in or adjacent to research laboratories and offices, medical clinics, and hospitals. Space and its design are no longer used to assert the librarian's authority over knowledge. The touchdown suites create a collaborative environment in which the non-foundational character of knowledge is strongly affirmed.

This third design option represents a decisive break with traditional reference desk design. That break is underscored by the location of the touchdown suites outside of the library building. One might aim at a similar effect within a library building, as in a public library to be built in Darien, Connecticut. The library director planning this new building is emphatic about her design purposes. She observes that the traditional reference desk is a barrier to a satisfactory reference transaction and, indeed, to a comfortable relationship with the reader. ''The design for the reference service point in our new library,'' she reports, ''calls for two or three individual work stations, or 'pods,' that each will accommodate one librarian and a patron. Librarian and patron will be seated, not across from each other but more at right angles to create an easy and more intimate exchange of dialogue and information.'' This design is driven by the idea that a successful relationship with readers ''depends on a 'two-way' conversation. We have worked hard in our library to avoid one-way conversations.''[33]

The element common to all three designs considered so far is a desk and the workspace the desk creates. Might one design a desk-less reference space and, in doing so, avoid the assertion of authority that inherently accompanies most designs involv-

ing a desk? Such a design would meet the challenge posed by one commentator, who observes that "new learning styles including team learning . . . require librarians to come out from behind the reference desk." (Thomas, p. 413) I know of no example of a desk-less reference service, so in imagining it I must ask some speculative questions. Might one, for instance, design the delivery of reference service around lounge furniture, rather than a desk (Fig. 7)? Such a space, even if it were in a library building, would through its informality affirm a primarily collaborative relationship between reader and librarian. While the two would necessarily know different things (there being no other reason for them to come together), the design and furnishing of the space would not needlessly assert the primacy of what either knows or the dominant authority over knowledge of the librarian or the reader. Might such a design also help relax the well-known reluctance of readers to "interrupt" the librarian at his or her desk, a reluctance fueled by the assumption that this expert must have more important work to do than to help the reader? A design that so self-consciously avoids asserting the expertise and authority of the librarian would require some other approach to the rationing of service than having readers queue in front of a desk. How might this be done? In a brain storming session with one public services librarian at a large academic library, we imagined the librarian coming to the reader in this lounge space at the reader's request.

I do not know whether a desk-less design for reference service could be made practical. In posing the possibility and asking these questions, I want us to recognize the bias toward a foundational view of knowledge implicit in most of our current design practice and, I suspect, in our views of what is practical. I want us, at least in our imagination, to explore what happens to our ideas of practicality when design begins with a strong allegiance to collaboration among learners, with an avoidance of claims to authority over knowledge, and with an embrace of a non-foundational view of learning. Such a thought experiment suggests that in considering alternatives for the design of physical library space we will necessarily find ourselves considering fundamental changes in the way we think about library services. Doing this drives us toward a true paradigm shift in library space design.

Figure 7
Imagining a Desk-Less Reference Service. Lounge Area, Main Library. Seeley G. Mudd Center, Oberlin College

Making A Choice, Making A Difference

At some point in the future, all academic libraries will surely be able to make the same planning choice regarding physical space that the Welch Medical Library has. When the availability of digital information becomes as pervasive for all other disciplines as it now is for medicine (and for science, law, and business), we might well be able to move academic library services to the reader's workspace. And in doing that, we will adopt, for better or worse, whatever definition of knowledge and of learning the architecture of that space dictates. We have already begun this move to the extent that librarians now strongly prefer going to instructors' classrooms to provide instructional services. This movement out of the library building, which depends on our ability to create powerful digital environments for learning anywhere, reflects a conviction that learning is best accomplished at a time and in a place of the reader's choice. It expresses the value the library places on the reader's time and what one might call the native character of the reader's own learning space.

I do not know when this future may be realized for all of the disciplines of the university, and I am sure it will come more slowly for some than for others. But readers' decided preference for digital information, the pressure on readers' time, and continued technical innovation will surely make the future that medical librarians envision possible for us all.[34] Such a future is attractively aligned with the capabilities of information technology and is especially responsive to graduate, professional study. Exactly because it drives library services to the readers' workspace and custom designs services for particular work needs, this design for library services accords best with the immense variety and centrifugal forces of the modern multiversity.

There is however a strong countervailing force evident in our commitment to liberal education and to the centripetal ideal of a single universe of knowledge—the idea that the university is itself a single, coherent place rather than an inchoate assembly of discrete places. And the library may indeed be the single most powerful community builder on campus; it may provide one of the most effective opportunities through its architectural design to express the unity of knowledge that underlies the idea of the university. An identifiable bricks and mortar place may be needed primarily because we wish to affirm learning as an expression of the liberal arts and to celebrate the university as a unifying organization capable of bringing all scholars—learners and teachers in all disciplines—together in a single community of the mind.

A library fit for this purpose cannot be designed around self-referential service concerns, as libraries customarily are today. To get libraries that are something more than "traditional dressed as new," we must relax the dominance of traditional services in library planning, focus on the learning behaviors of readers, and self-consciously use space to enable community-based learning. Doing this will effect a paradigm shift in our design of both library space and library services. In doing this, we will, as John Seely Brown urges, "move far beyond the traditional view of teaching as delivery of information. Although information is a critical part of learning, it's only one among many forces at work. It's profoundly misleading and ineffective to separate information, theories, and principles

from the activities and situations within which they are used. Knowledge is inextricably *situated* in the physical and social context of its acquisition and use." (Brown, p. 65)

Library space design is concerned, quite literally, with this *situating* of information in the social context of learning. This *situating* is the core function of a bricks and mortar library. This is the sole function, in my view, that can justify the immense investments we continue to make in physical library space, even as information technology might appear to make such investments unnecessary. This *situating* function aligns the library and its building with the basic educational mission of the university. This is the function that allows us, amidst the centrifugal forces of the multiversity, to reclaim the idea of the university as a coherent community of learners. As information technology becomes the vital nervous system of the university, this *situating* function maintains and indeed strengthens the library as the heart of learning and of the university.

Notes and References

1. ©Scott Bennett, 2005. Readers of this essay and librarians may copy it without the copyright owner's permission, if the author and publisher are acknowledged in the copy and the copy is used for educational, not-for-profit purposes. A version of this paper was first delivered at the 2005 Roundtable sponsored by the Kanazawa Institute of Technology and the Council on Library and Information Resources.
2. See Scott Bennett, *Libraries Designed for Learning* (Washington, DC: Council on Library and Information Resources, 2003), pp. 6–7.
3. As does Maurice Sendak's *Where the Wild Things Are* (New York: Harper, 1963).
4. See Richard A. O'Connor and Scott Bennett, "The Power of Place in Learning," *Planning for Higher Education*, 33 (June–August 2005): 28–30.
5. The Suzzallo Library at the University of Washington, Seattle, is another magnificent library designed in the idiom of a church. The most common alternative design idiom in the United States is that of the secular palace of the mind, exemplified by such grand buildings as the New York Public Library and the Jefferson Building of the Library of Congress.
6. See Chapter 4, "Evaluation, Preference, and Human Needs," by Stephen Kaplan and Rachel Kaplan, *Cognition and Environment: Functioning in an Uncertain World* (New York: Praeger, 1982), pp. 73–98. The four factors referenced here are developed at some length in the chapter section titled "Informational Factors in Environmental Preference," pp. 81 ff. Ken A. Graetz and Michael J. Goliber cite the Kaplans' book and briefly explain these four factors in "Designing Collaborative Learning Places: Psychological Foundations and New Frontiers," *New Directions for Teaching and Learning*, 92 (Winter 2002): 15.
7. In can be done, however. Yale's Irving S. Gilmore Library of Music was recently build in a light court of the Sterling Memorial Library and strongly echoes the gothic design of its host building.
8. See Cathy De Rosa, Lorcan Dempsey, and Alane Wilson, *The 2003 OCLC Environmental Scan: Pattern Recognition* (Dublin, OH: OCLC, 2004), pp. 8–9.
9. See "Civilization III" by FIRAXIS Games, at Computer Simulation Games, http://compsimgames.about.com/cs/civilization3/ (June 5, 2005).
10. See Keith Bradsher, "Sad, Lonely? For a Good Time, Call Vivienne (3G Required, Batteries Extra)," *New York Times*, February 24, 2005: C1, C5.
11. Rolin Jones provides a moving depiction of such a hacker in his play *The Intelligent Design of Jenny Chow* (2004).
12. De Rosa, p. 100, citing "Bill Gates at COMDEX 2003: The Era of Seamless Computing," *PressPass* (November 16, 2003). Gates' speech is available at http://www.microsoft.com/billgates/speeches/2003/11-16comdex2003.asp (June 5, 2005).
13. Private correspondence, March 2005, with Louise Berry, Director, Darien [Connecticut] Public Library.
14. See Fred Kent et al., "How to Become a Great Public Space," *American Libraries* 34 (April 2003): 72.
15. See *Libraries Designed for Learning* and the two Shill and Tonner articles, "Creating a Better Place: Physical Improvements in Academic Libraries, 1995–2002," *College & Research Libraries*, 64 (November 2003): 431–466; and "Does the Building Still Matter? Usage Patterns in New, Expanded, Renovated Libraries, 1995–2002," *College & Research Libraries*, 65 (March 2004): 125–149.
16. For more information about information literacy, see the Web site of the Association of College and Research Libraries, http://www.ala.org/ala/acrl/acrlissues/acrlinfolit/informationliteracy.htm (June 5, 2005).
17. See, for instance, Lisa Janicke Hincliffe, *Neal-Schuman Electronic Classroom Handbook* (New York: Neal-Schuman, 2001); two articles by Donald Beagle: "Conceptualizing an Information Commons," *Journal of Academic Librarianship*, 25 (March 1999): 82–89, and "Extending the Information Commons: From Instructional Testbed to Internet2," *Journal of Academic Librarianship*, 28 (September 2002): 287–296; and Information Commons: A Directory of Innovative Services and Resources in Academic Libraries, http://www.brookdale.cc.nj.us/library/infocommons/ic_home.html (June 5, 2005).
18. See De Rosa, *The 2003 OCLC Environmental Scan*; Diana Oblinger, "Boomers, Gen-Exers, and Millennials: Understanding the New Students," *EDUCAUSE*, 38 (July/August 2003): 36–43; and Robert B. Barr and John Tagg, "From Teaching to Learning—A New Paradigm for Undergraduate Education," *Change*, 27 (November/December 1995): 12–25.
19. See Michael Wooliscroft, "Challenge, Stimulation and Ultimate Fulfilment: The Development of the Information Services Building at the University of Otago, 1993–2002," *Australian Academic and Research Libraries*, 34 (June 2003): 127. See also Mark Y. Herring, "Our times, they are a 'changin,' but are we?" *Library Journal*, 126 (October 2001): 43.
20. Craig Hartman, an architect with Skidmore Owings & Merrill, observes that "while there is a long tradition to draw on, there is no agreed on paradigm for the library of the future. Getting to this paradigm is the task before us;" see "Memory Palace, Place of Refuge, Coney Island of the Mind: The Evolving Roles of the Library in the late 20th Century," *Research Strategies* 17, nos. 2–3 (2000): 112.
21. De Rosa p. 105. The expression "ultimate question of life, the universe, and everything is" derives from the famous book by Douglas Adams, *Life, the Universe, and Everything* (New York: Harmony, 1982).
22. The imbalance in library space design practices is argued at greater length in Scott Bennett, "Righting the Balance," in *Library as Place: Rethinking Roles, Rethinking Space* (Washington, DC: CLIR, 2005), pp. 10–24.
23. See Kenneth A. Bruffee, *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*, 2nd ed. (Baltimore, MD: Johns Hopkins University Press, 1999), p. 180.
24. John Seely Brown, "Learning in the Digital Age," in *The Internet and the University: 2001 Forum*, edited by Maureen Devlin, Richard Larson, Joel Meyerson (Boulder, CO: EDUCAUSE, (2002), p. 69; available at http://www.educause.edu/ir/library/pdf/ffpiu015.pdf (June 5, 2005).
25. Alice Trussell, "Breaking the Mold: Building a New Engineering Branch Library Focused on Electronic Delivery of Information," *Science & Technology Libraries,* 24 nos. 3–4 (2004): 241.

Trussell emphasizes how little like a traditional library a new library looks when it focuses primarily on the delivery of digital information.

26. Jim Neal makes a powerful and provocative argument for this choice in his presentation, "Physical Places/Virtual Spaces," in *The Library as Place/Symposium on Building and Revitalizing Health Sciences Libraries in the Digital Age, 2003* (Bethesda, MD: National Library of Medicine & Association of Academic Health Sciences Libraries, 2004); a CD-DVD.
27. See "Welsh Medical Library [at Johns Hopkins University] Architectural Study," available at: http://www.welch.jhu.edu/architecturalstudy/index.html (June 5, 2005).
28. See Steven M. Foote, "Changes in Library Design: An Architect's Perspective," *portal: Libraries and the Academy,* 4 (January 2004): 41–42. The list of trends cited by Foote comes from Michael J. Crosbie and Damon D. Hickey, *When Change is Set in Stone: An Analysis of Seven Academic Libraries* (Chicago, IL: Association of College and Research Libraries, 2001), pp. 7–18.
29. See Oblinger and *How People Learn: Brain, Mind, Experience, and School*, edited by John D. Bransford, Ann L. Brown and Rodney R. Cocking (Washington, DC: National Academy Press, 1999).
30. Jeanne Narum stresses the importance of starting building projects with the right questions in "Building Communities: Asking the Right Questions," a Project Kaleidoscope document available at http://www.pkal.org/documents/Building%20Communities%20-%20Asking%20the%20Right%20Questions.pdf?CFID=79813&CFTOKEN=75943407 (June 5, 2005).
31. For more information about planning for the library at Duke, see the Perkins Library Expansion and Renovation Project, available at http://staff.lib.duke.edu/renovation// (June 5, 2005); for Johns Hopkins, see Kathleen Burr Oliver, "The Johns Hopkins Welch Medical Library as Base: Information Professionals Working in Library User Environments" in *Library as Place*, 66–75; for the Ohio State University Library, see the Learning Group of the OSU Libraries, "Report on the Renovation of the Thompson Library" (September 2004), http://kb.osu.edu/dspace/handle/1811/208 (June 5, 2005); and for Sewanee, see "Righting the Balance" in *Library as Place*, pp. 12 ff.
32. Mary Augusta Thomas observes that "the reference desk may be the only feature of a college or university library that seems to remain the same," in "Redefining Library Space: Managing the Coexistence of Books, Computers, and Readers," *Journal of Academic Librarianship*, 26 (November 2000): 413.
33. Private correspondence, March 2005, with Louise Berry, Director, Darien [Connecticut] Public Library. In making the point about two-way conversations, Ms. Berry cites Chapter 4, "Markets are Conversations," in Rick Levine, et al., *The Cluetrain Manifesto: The End of Business as Usual* (Cambridge, MA: Perseus, 2000), pp. 75–114.
34. Consider, for instance, that for years we have affirmed our ability to get the entire contents of the Library of Congress onto one small, portable storage device. But no one imagined actually doing it. Now something like this imagined technical feat promises to become an actuality, as Google undertakes the conversion to digital form of large portions of the collections at major research libraries. See John Markoff and Edward Wyatt, "Google is Adding Major Libraries to its Database," *New York Times*, 14 (December 2004): A1.