
Forty-Five Years After Lamont: The University Undergraduate Library in the 1990s

MICHAEL O. ENGLE

ABSTRACT

IN 1949, HARVARD'S LAMONT LIBRARY OPENED, embodying the idea that undergraduates could best be served from their own library. The undergraduate libraries also protected the collections and freed reference staff of research libraries from the effects of heavy undergraduate use. In the 1970s and 1980s, bibliographic instruction programs developed and expanded. In the 1990s, libraries are under pressure from budget cuts, staff reductions, technological change, and the higher expectations of undergraduates and their parents. Some undergraduate libraries have integrated teaching with new technology or explicitly assumed the role of gateway to the collections of the larger library while maintaining separate physical facilities for undergraduates. Other undergraduate libraries have merged with, or been absorbed into, the library system, disappearing as separate entities. The arrival of the virtual library is encouraging the centralization of capital and the decentralization of intellectual work. Research and debate on the effects of these changes on the education of university undergraduates is needed.

INTRODUCTION

When Harvard University's Lamont Library opened in 1949, it was the first library designed specifically for the undergraduates of a research university with collections and services housed in a separate building. Forty-five years later, undergraduate libraries in research universities face transitions on a much larger scale. The tools of research, teaching, and

scholarship are changing; the way undergraduates use libraries is changing; and the resources and services they use are changing. The scholarly model of the past 500 years—the physical distribution of ideas and information stored and expressed in printed words on paper—is being joined to the future, to the era of hypertext and multimedia documents stored in digital form and distributed almost instantaneously on a worldwide communications network. At the same time, the performance of research-intensive universities is the subject of public debate with the value of an undergraduate education as one major topic. If an undergraduate education at a major research university is worth the price, the adequacy of library service for undergraduates is an important factor for students and their families to consider.

The establishment of Lamont Library marks a milestone in the development of library services and collections for university undergraduates. The opening of Lamont, at a time of major expansion that established research-intensive universities in the United States as the finest in the world, accelerated the end of single central libraries as the norm in research universities (Froomkin, 1993, p. 50). The division of main libraries into research and undergraduate libraries was a first step in a long process of decentralization and distribution of central library collections into separate buildings. The construction of separate library facilities for rare books and manuscripts, regional collections, and storage of low-use materials has continued into this decade (Kuhn, 1969, p. 188; Wilkinson, 1971, p. 1568).

DEVELOPMENT OF UNDERGRADUATE LIBRARIES

The establishment of separate undergraduate library buildings was an attractive administrative choice for many reasons. Research collections of printed materials became so large that they were difficult to manage physically and were overwhelming to many novice users. When rapidly growing central collections required additional shelf space and the construction of new buildings to house them adequately, library and university administrators split central collections and services into two units for the two major user groups—undergraduates on the one hand, and faculty and graduate students on the other—and built a new building for one. The new library building could be much smaller than the one required to house the collection for both groups. Keyes Metcalf, the librarian at Harvard, recognized the difficulties undergraduates faced when using Widener Library, with a collection, building, and services designed for faculty and graduate research, and that housed library collections which were quite small, and he successfully promoted the construction of a new building for undergraduates. When other universities emulated the Lamont model, it sometimes made more sense for them to construct a new research facility. But in either case, following construction, the

collections were divided and partially duplicated, and the appropriate services were set up in each building. At many universities, research collections were then closed to undergraduates. Braden (1970) carefully documented this process at Harvard, Michigan, South Carolina, Indiana, Cornell, and Texas.

By the late 1950s, at Cornell University, the old central library, built in 1891, was overflowing with more than 800,000 volumes in a space built to hold half that number. A new building, Olin Library, was constructed for the social sciences and humanities research collection. When Olin opened in 1961, the old building was remodeled, renamed Uris Library, and reopened in 1962 with 42,722 volumes of the projected 50,000 basic collection (Braden, 1970, p. 103; Wilkinson, 1978, pp. 143-44).

By 1970, separate undergraduate collections and services were a well-established feature of many university library systems. Kuhn lists nineteen new buildings constructed after Lamont opened. The library literature of the late 1960s and early 1970s is filled with articles, books, symposium papers, and at least two dissertations (Braden, 1967; Wilkinson, 1972) documenting and assessing the effectiveness of the movement. Wilkinson, who headed the Uris Library from 1962 to 1967, grouped undergraduate library services into seven functions or collections: study hall, social center, reserve book dispenser, browsing collection, listening facility, visual materials center, and reference services (1971, p. 1568). The undergraduate library differed from the traditional central library in significant ways. It provided open access to a carefully selected core collection and special services to undergraduates in one location, including new services not usually available in research libraries of the time (e.g., audiovisual and instructional services), and it was constructed or remodeled with undergraduate use patterns in mind (Braden, 1970, p. 2). The popularity of this strategy with undergraduates was measurable. Book circulation to undergraduates increased, large course reserve collections were established and used heavily, and building traffic included not only students seeking quiet study space away from the noise of the dormitories but also those who wanted to see and be seen. Nearly thirty years after it opened, a 1990 use survey showed that Uris Library is still popular, accounting for 25 percent of the foot traffic in the sixteen-unit Cornell University Library (Murray-Rust, 1993, p. 1). The change was also popular with faculty and graduate students, who appreciated having more of the research library's collections, study carrels, and reference librarians to themselves.

In the beginning, instruction in undergraduate libraries consisted of one-on-one teaching during reference encounters and orientation tours for incoming first-year students. The instructional role of the undergraduate library was greatly developed and extended in the 1970s and after by proponents of bibliographic instruction like Evan Farber at Earlham College and Patricia Knapp at Monteith College. Virginia Tiefel at Ohio

State University took the lead in adapting college-library models of bibliographic instruction to the university environment. Instruction of undergraduates in the research process and the structure of disciplinary literatures became a central service of undergraduate libraries.

By 1976, the undergraduate library movement had peaked. There were twenty-five separate university undergraduate libraries; another fifteen undergraduate libraries shared buildings. Seventeen had come and gone since Braden's 1965 dissertation survey, and signs of reevaluation were appearing. In an article in *College & Research Libraries*, Wingate (1978) questioned the continued usefulness of separate undergraduate libraries, citing the difficulty of meeting undergraduate research needs with a core collection and the expense of duplicating services and collections. He also questioned the wisdom of segregating undergraduates from research collections (pp. 30-32). In a 1982 symposium on the state of university undergraduate libraries, Irene Braden Hoadley, then director of the Texas A & M University Library, called the separate undergraduate library a dinosaur whose time of usefulness had passed (Person, 1982, pp. 5-6).

The symposium responses to Hoadley's essay illustrate the shakeout of less viable programs and the functions that successful undergraduate libraries were emphasizing: instructional services and, to a lesser extent, course reserve and audiovisual services. In successful libraries, bibliographic instruction became a primary function as the service focus began to shift from place to process, from giving students a place of their own to preparing them for the process of lifelong learning. Librarians working with undergraduates developed a variety of innovative programs to teach basic bibliographic and critical thinking skills to new students and to orient upper-level students to the literature of their major. One result of librarians' increased involvement in instruction was a greater awareness of the low status of undergraduate teaching in the research university. In one symposium response to Hoadley, Shelley Phipps observed that "graduate and faculty research, not undergraduate education, has become the *raison d'être* of many universities. Teaching undergraduates is no longer the main responsibility of the faculty; research, publication, and recognition have usurped this function" (Person, 1982, p. 10). Her concern was soon taken up by other voices both within and outside the academy. While instructional activity grew in importance in the 1970s and 1980s, other services and collections continued to be provided. Stack and reserve collections supplemented the textbooks and paperbacks students bought for their classes. Audiovisual collections grew and expanded into new formats—cassette audio and videotapes and, later, compact and video disks. The faculty began putting video materials on reserve for individual viewing and class showings.

By the mid- to late 1980s, a host of changes surfaced that has produced the turbulence and excitement of work in a university library today. Higher education, for many years an unquestioned good in the

United States, has come under increasing public criticism. The financial resources of research universities are under pressure. Technological developments present new and constantly changing opportunities and costs for everyone engaged in scholarly teaching, research, publication, service, and support.

FINANCIAL CONTEXT

Financial pressures faced by research universities are forcing difficult choices. Since the late 1980s, research universities have been cutting back academic and administrative operations (McMillen, 1989, p. A21). The enemy has not been inflation but a complex of factors that have increased the cost of running universities and reduced available income. In an article on the role of financial aid in maintaining a diverse student body, Ehrenberg and Murphy (1993) outline the following sources of financial pressure on research university budgets: reduced annual increases in tuition, relative increases in faculty salaries, more conservative endowment practices, deterioration of physical plant, increased library costs for international materials, the expenses associated with university-wide computerization, decreased government support, more competition for student applicants, and substantial increases in financial aid to students (pp. 66-67). To these factors can be added increases in benefit expenses, especially for health care.

The three major sources of revenue—tuition, endowment income, and government support—are all down or increasing at a slower rate. A public outcry over tuition increases that consistently exceed the rate of inflation and the rate of personal disposable income growth in the United States has led boards of trustees to reduce annual increases. Until the 1980s, tuition increased at roughly the same rate as inflation and personal income. During the 1980s, faculty salaries went up by 20 percent over inflation in a more competitive labor market, and, at the same time, the financial aid costs of admitting and retaining an economically, ethnically, racially, and geographically diverse student body increased. Since 1980, tuition increases have exceeded growth in personal income, effectively increasing the financial aid needs of students and their families.

In an effort to keep up with high inflation rates and avoid equally large annual increases in tuition, many private institutions overspent their endowments in the 1970s, reducing the total rate of return on their investments. By the late 1980s, Cornell had reduced the annual amount of endowment used for income from 6 percent to 4 percent to reverse the erosion of endowment principal. State and federal support for students has leveled off as other social needs have gained higher priority (e.g., health care and deficit reduction). In the wake of the scandal over alleged improper overhead charges at Stanford University, federal support of university research through reimbursement of indirect costs has

decreased an average of almost 6 percent from 1991 to 1994 at major research universities. Each 1 percent drop can mean as much as \$1.5 million in lost income (Cordes, 1993, p. A29).

Within university library systems, similar priority shifts have become necessary. Librarians are well aware of the increased cost of international serials subscriptions. The proliferation of titles and large annual price increases, in part due to unfavorable exchange rates, has resulted in several rounds of serials cancellations and continues to shift the balance of materials expenditures away from monographs toward serials. Undergraduate collections have largely been spared these problems since most of their serials and monographs are published in North America. In addition, the strong emphasis on monographic titles available in paperback editions has kept the cost per title down.

Computerization is another matter, however. Computer technology has grown more central to library work for over a decade, a trend that shows no sign of abating. The capital costs of hardware and software and the staffing costs of maintaining, programming, and upgrading computers consume an increasingly large percentage of library budgets. Upgrading campus networks with fiber-optic cable, extending the network to offices, dormitory rooms, and off-campus users, and the seemingly continuous hardware and software upgrades are significant long-term expenses for universities. On the other hand, the federal government continues to provide major support for improving the national networks that link campuses to each other and to the rest of the world. Once the local network is in place, access to the wider world is heavily subsidized.

The greatest expense of the university, as well as its greatest resource, is highly educated and highly trained people. Because personnel costs are a large part of library budgets, this is also the only area where really significant cuts can be made when a large budget cut is mandated. In the current financial climate at research institutions, layoffs and selective excellence are part of the strategy of institutional survival. Although strong programs and services may be further strengthened, the weak or politically vulnerable ones will be cut. In most libraries, no new staff will be hired for the foreseeable future. In some, staffing is being reduced, and library services and collections are being combined. The staffs and collections of separate undergraduate libraries are prime candidates for consolidation.

At the same time that research universities and libraries are struggling to respond effectively to these financial pressures, two additional developments are strongly affecting undergraduate education and undergraduate libraries: the rise of new technology for the communication and dissemination of scholarly information and calls for a renewed emphasis on the importance of teaching. These three factors—increasing financial pressures; the rapid growth of networked, hypertext,

multimedia systems; and calls for a stronger commitment to teaching—define the current environment for librarians working with undergraduates in the research university.

The establishment of separate buildings, services, and collections was the first systematic response to the information and learning needs of university undergraduates. The second was the development of instruction programs to teach students the research process—how to use libraries to find and evaluate information and ideas. A third change is well underway—the development of Boolean-searchable computerized catalogs, indexes, and full-text databases; the networking of these resources around the world; and the arrival of hypertext, multimedia capability on the Internet and on computers connected to it. Each development has been built on the previous one. Now computer professionals, librarians, faculty, government and commercial providers, and a host of free-lance denizens of the Internet are engaged in realizing the potential of a new worldwide information system. Librarians must think to the future and stay ahead of these rapidly accelerating changes.

TECHNOLOGICAL CHANGES

A virtual library is being constructed, one that exists within and beyond the physical library. Just as library buildings, collections, and services were designed and adapted for undergraduates, now the work of undergraduate libraries is to maintain carefully what is useful in the old physical system even as the virtual system and its physical components (computers and networks) are created and elaborated. Librarians have been engaged in building and integrating the virtual library for some time, but initially as an extension of the print era—databases of searchable citations whose primary use was to locate print materials on paper or in microformat. The combination of computer software, hardware, and networks forms the most powerful tool yet for organizing and accessing information and ideas. Although these tools are often designed and developed for nonlibrary purposes, librarians are taking advantage of the technology to perform traditional library tasks more effectively. For librarians working with undergraduates, the enhancement of teaching and learning made possible by computers is truly exciting. The liveliest periodicals in higher education are full of discussions of the new teaching and learning possibilities in undergraduate education: hypermedia learning (Jensen, 1993), virtual classrooms (Sliwa, 1994), and “the library of the (not-so-far-distant) future” (Lyman, 1991). Even the term paper, the learning tool that has brought librarians and classroom teachers together for decades, is poised to make the jump to hypermedia (DeLoughry, 1994).

The word “hypermedia” is a shortened form of hypertext and multimedia. Hypermedia documents are the building blocks of the virtual library and classroom—the whole system of authoring, storage, retrieval, and interaction that constitutes a new arena of teaching, learning, and

scholarship. The virtual library is the collection of documents and files in digital format that rests in optical and magnetic memory. These documents and files can be speedily transferred around the world and simultaneously viewed or read. They can appear as text, still images, moving images, sounds, and any combination of these (the multimedia aspect of hypermedia). Software allows these digitally formatted documents to be combined, divided, stretched, and colored in either two or three dimensions. They can be linked internally to another part of the same document or externally to any other networked document (the hypertext aspect of hypermedia). The digitized information in the document can be printed, displayed on a monitor, projected on a screen, and played from speakers, headphones, or earphones.

The tools of the virtual library allow librarians working with undergraduates to expand the two functions that have become most important in the years since Lamont opened. The first of these functions is bibliographic instruction—teaching students how to navigate the information systems supported by academic libraries. The second function is selecting and making available core collections of documents that represent the knowledge and insights produced or preserved by scholars, researchers, artists, and writers. Librarians have, for the most part, delivered that instruction in person and housed those collections in a physical building. In the virtual library, the classroom, the point of use, and the library become one in a computer. The core collection which librarians select, organize, and point to exists there, too.

This is not to say that the virtual library will completely replace the physical library or that the digital document will replace the printed document in the near future. For some time yet, perhaps indefinitely, the physical and the virtual will exist side by side and interact with one another. But one thing seems clear: although printed documents like books can be created directly from digital documents, only some digital documents can be adequately represented in book form. Books retain their ease of use and portability, but the printed word, by far the main constituent of most books, favors specific styles of learning, as does the way knowledge is currently documented and taught in the academic world. Digital documents offer students and teachers a much wider choice of ways to learn and teach and new ways to access knowledge. Visual learners, those who learn better from model-based reasoning, dyslexic students, and students well ahead of or behind the level of instruction currently provided in the classroom and at reference desks, could be aided by hypermedia instruction delivered on a computer in their own rooms, in computer labs, or at public terminals in libraries—anywhere there is a computer. Sliwa (1994) calls the variety and individualization that is possible with computer-based instruction “mass customization.” He suggests that it is best used to replace some lecture/demonstration methods for large classes

and to free instructors for more one-on-one or small-group interaction with students (pp. 9-10). With computer-based hypermedia instruction, the individual determines the pace and direction of her learning, and she can leave and return anytime. Research indicates that the most effective teaching and learning strategies involve a mix of interactions with people and with computers in a variety of settings (Terenzini & Pascarella, 1994, pp. 29-30).

The case of electronic mail is an example of the importance of mixed interactions. Although communication over networks using electronic mail has grown for academic work, particularly over long distances, e-mail lacks some qualities that continue to be important in human relationships, particularly the complex nonverbal cues and responses that in-person contact provides. The anxiety that some students experience when they begin making the transition from smaller secondary-school and public libraries to a university library system is best dealt with through the multidimensional contact that is possible in person.

Existing core collections of print texts will continue alongside virtual documents as well, and librarians will need to be adept at selection in both areas. Although some projects are underway to convert, retrospectively, print documents to digital form, the number of years involved in converting just the citations representing print documents to digital form suggests that print and microform collections will continue to represent a whole era of human scholarship and culture for a long time to come. But as more texts are produced and archived in digital form, the overall balance of library holdings will inexorably shift toward the virtual environment.

To straddle effectively the worlds of the physical and the virtual library, librarians must develop skills in instruction, organization, and selection in the virtual library. The development of software for creating, organizing, and browsing World Wide Web sites on the Internet has made the virtual library an everyday reality for many librarians, faculty, and undergraduates. Creating and publishing hypermedia instructional documents in the virtual library requires three software packages on an adequately powerful personal computer hooked to a campus network and the Internet. The first piece of software needed is a Web browser (e.g., Netscape, NCSA Mosaic, Cello, MacWeb) to find and display hypermedia documents. Documents can be located on another computer hooked to the network or on the same computer's hard disk. The second piece of software needed is a hypertext editor for writing hypermedia documents and inserting the textual tags that allow hypertext links to other documents; adding image, video, and sound files; and formatting text. Although hypermedia documents can be written with word processing software, hypertext editors smooth and support the process by providing preformatted text tagging and other helpful features. To make the docu-

ments available on the network, server software is required. This gives the hypermedia documents an address on the network and "serves" them—makes them available to anyone else with browser software and a network connection.

At Cornell, Web browser software is now distributed free to students, faculty, and staff as part of a software package that allows menued access to a variety of network resources, including the online catalog, periodical indexes, OCLC and RLIN, course schedules, grades, bursar accounts, and a local Gopher client. Students can access a variety of World Wide Web servers containing hypermedia documents from libraries, departments, and an individual's computer, as well as Web sites from around the world via the Internet. Not all the dormitories are networked yet, but as many as half the first-year students in library instruction sessions use Web-capable networked computers in their rooms.

Along with hands-on instructional labs in the library, librarians are developing an instructional presence on the network in the form of hypermedia-based tutorials. These tutorials teach research strategies: how to search for books and periodicals, evaluate and cite resources, and use Internet resources. Documents in tutorials can be linked to each other, to other instruction documents on the network, and to online catalogs and periodical indexes for live searching. In addition, glossaries of terms can be linked to significant occurrences of those terms in the tutorial text. Tutorials can also be linked to online information and reference services using e-mail and customized reference, purchase request, and interlibrary loan forms.

Networked tutorials are available at any public access terminal, lab computer, or personal computer that has Web browser software and can be accessed during group sessions in the hands-on instruction laboratory. The documents can be changed, updated, and restructured from the librarian's office computer. Teaching faculty are also creating their own Web sites for classes. Librarians participate by creating hypermedia documents for the class Web server. These documents provide an annotated list of sources, search suggestions, and comments. If the librarian's computer is also a server, the class instructor can link to it from her class server. Alternatively, the librarian e-mails his Web documents to the instructor as attachments. The instructor then transfers the files to the computer serving her class, and all students have access to the information. As scholarly communication and publication moves into the digital format and onto the network, the teaching of undergraduates will follow. Each venue has its own rules for access and navigation, and each can be used to teach and learn about the other.

Web browser software can also be used to assemble and organize hypermedia documents of interest to undergraduates from Web sites around the world. The selector in cyberspace, the virtual world of Web

sites on the Internet, can scan listings of new sites on the Internet and follow promising hyperlinks to new document collections. Selectors can also use the various search engines available for finding Web sites. Criteria for selection can be based on the criteria for print and audiovisual materials. Links to appropriate sites can be assembled by the selector, organized by subject, and briefly described. Selectors can also solicit online suggestions from other Web explorers and library users, including undergraduates. Other denizens of the World Wide Web are creating subject guides to Internet resources by selecting, indexing, and linking to Web sites. Several search engines are available that allow keyword searching of portions of networked Web documents. Much work remains to be done to improve the precision of Internet searching by using standard document descriptions and formatting.

ORGANIZATIONAL CHANGES

The financial pressures and technological changes in research universities are stimulating organizational change. In a time of limited resources and new technical possibilities, libraries must adapt or risk becoming irrelevant. An informal survey of changes in the structure and services of university undergraduate libraries conducted using UGLI, a listserv for the Undergraduate Libraries Discussion Group, indicates that organizational responses vary widely. Libraries are responding by changing staffing patterns and upgrading the technological infrastructure. The effect of these changes on services and collections is difficult to assess.

Recent structural changes seem to fall into five categories:

1. construction of entirely new, technologically sophisticated library buildings that are not called undergraduate libraries but are probably used primarily by undergraduates. Examples: Leavy Library (University of Southern California) and University Center Library (George Mason University);
2. refurbishing and technological upgrading of existing undergraduate libraries. Examples: Lamont Library (Harvard University) and the undergraduate libraries at Ohio State University and the University of Michigan;
3. merger with another library unit while maintaining a separate building, service points, and collection. Example: Uris Library (Cornell University);
4. disappearance of the undergraduate library as a separate building, collection, and staff. Examples: Meyer Library (Stanford University) and Sinclair Learning Resources Center (University of Hawaii at Manoa);
5. staff reductions with no other major changes. Example: the undergraduate library at the University of California, San Diego.

The variety of these responses suggests that there is no typical organizational response by university libraries to the rapidly changing environment. Current changes in collections and services for undergraduates in research universities have not received the intensive scrutiny that accompanied the changes following the opening of Lamont. The best documented of the recent transitions may be the changes at Harvard's Lamont and Cabot libraries and the reorganization of Widener Library (Dowler, 1992; Hightower, 1993; Lee, 1993). Although some institutions are upgrading services and facilities, in others there is justifiable concern over the negative effects on the education of university undergraduates caused by the cutting or merging of the staff, collections, and services previously dedicated to undergraduates.

The merger of Olin and Uris libraries at Cornell provides an example of how one institution with a separate undergraduate library has chosen to change its deployment of staff and services in response to technological and financial pressures. The historical context of the establishment of Uris Library—its planning, opening, and first seven years of use—has been extensively chronicled by Wilkinson (1972, pp. 139-73) and Braden (1970, pp. 93-115). During the 1980s, Uris followed the general pattern of university undergraduate libraries by developing a strong instructional program. The current reorganization began in January 1993 when the head of the Uris Library moved on to another position. The library administration used the opportunity to restructure public services in Uris and Olin libraries. A committee of Olin and Uris librarians was appointed to recommend a process for merging public services (reference, instruction, circulation, course reserves, stack management, administration, and part of collection development) previously performed separately in each library. One stipulation of the discussions was that the vacated position of head of the undergraduate library would not be filled in the new organizational structure. The report of this committee recommended that the merger of access services functions (circulation, course reserves, and stack management) begin immediately under the current head of access services in Olin. This group also recommended the formation of a second committee of all the reference and instruction librarians in both libraries to meet in Fall 1993 and to recommend how services and staff should be reorganized.

The second committee met throughout Fall 1993 under the leadership of one of the reference librarians. This committee divided into subcommittees on services, collections and technology, space utilization, and staffing issues to analyze the current program and to recommend changes for the future. In January 1994, the committee recommended the establishment of a new reference service unit across both libraries. The recommended organizational structure consisted initially of four interest groups—collections, reference/information, instruction, and

technology—each coordinated by a librarian in the division. The coordinators would work with the reference head to oversee services, determine priorities, and facilitate communications.

The committee also recommended more extensive use of paraprofessional staff at service points in Uris, freeing librarians for other duties. Other recommendations included building a state-of-the-art hands-on instructional facility; merging the reference staff and programs of the two libraries; developing an outreach program for upper-level undergraduate instruction; and writing a single collection development statement for the reference collections.

Administrative responsibilities that were divided between libraries before the merger have been consolidated. The organization is considerably flattened, with the eleven librarians reporting to the head of reference. One result is a more departmental atmosphere with considerably more autonomy for individual librarians. The increased autonomy has contributed to the successful development of several initiatives to strengthen instruction for undergraduate and graduate students using computer technology. With fewer heads and more peers, consultative relations have been strengthened at some sacrifice to speed of task execution. Even with increased use of e-mail, working in one larger group informally divided into smaller working groups, rather than in the two smaller departments of the pretransition days, can be frustrating. It takes longer to accomplish some tasks in a larger group of peers than in a smaller, more hierarchical, structure; it is harder to hold individuals accountable.

Another major outcome of the merger has been increased fiscal and staffing flexibility. With the income and budgetary resources of the public service functions in two libraries combined, the director and deputy director have more flexibility to deploy capital and more resources to focus on major projects. This has resulted in a significant upgrading of hardware for office and instructional use. A new hands-on instructional facility is finished and is being heavily used by undergraduates; another facility will be completed shortly. The new facility doubles as a public computer lab when it is not reserved for instruction, adding twenty machines to the existing, and very heavily used, twenty-eight computers in a public lab in an adjacent room. Learning in a hands-on environment is very popular with students and has enhanced the effectiveness of the extensive instruction program of the combined libraries.

After years of a stable staffing environment in both libraries, the merger of reference and access service staff has resulted in an organization more responsive to change. New assignments and informal work in groups to address specific issues are becoming more common in the larger arena of the new division. Although people accustomed to the stable environment feared the changes, including the breakdown of the sepa-

rate subcultures in the two libraries, there is a growing awareness that the merger meets a need for ongoing organizational and individual adaptability to deal effectively with the new opportunities presented by technological advances and the demands of repeated budget reductions.

Another significant change has occurred because of the merger—a reduction in the quantity and quality of traditional reference service for the users of the Uris Library. Before the merger, Uris librarians worked up to twice the desk hours of the Olin librarians. Long desk hours and large teaching loads were hallmarks of the organizational culture of the old Uris environment. To equalize the desk loads in the new division and to respond to one round of budget cuts, the lowest-use Uris reference desk hours were trimmed, and information assistants were substituted for professional coverage one week night and Saturday afternoon. Paraprofessional staff also replaced a librarian where two librarians had been providing double afternoon coverage. Paraprofessional staff have done excellent work, but clearly some expertise and experience that was previously available to students during those times has been lost. The immediate referral of questions beyond the scope of paraprofessional knowledge and training is often not possible, a situation that can be only partially alleviated by improved training and communication. Along with the decrease in service hours and the general level of expertise and experience at the service desks, more librarians are working at multiple service points and teaching a larger variety of classes. Sharing skills working with specific user groups and the sharing of information about local resources is increasing. As a result, referrals are more informed. The reduction in desk hours for Uris librarians has allowed them to increase significantly their involvement in, and leadership of, library-wide groups. They have also used the additional off-desk time to plan and develop services in the virtual library.

The Olin-Uris merger at Cornell illustrates one kind of institutional response to the forces that are pulling separate units of a decentralized library system into closer contact with one another. Foremost among the catalysts of this change is the centralizing effect of systemwide computer systems. The arrival of the online catalog and its circulation, acquisitions, and serials subsystems has encouraged a shift toward organizational centralization and procedural uniformity. Differences in circulation and technical processing procedures across units of the library tend to be highlighted by common use of centralized hardware and software. These differences also interfere with efficient service delivery. In addition, administrators have to amass sufficient capital to acquire the hardware, software, and network access necessary to implement campuswide information systems. Similarly, computer expertise has to be hired or contracted centrally for system-wide maintenance and development. Computer professionals work on a whole system, not the terminals in one unit of the

library. The difficulty of concentrating the capital necessary to subscribe to and mount networked indexing and abstracting services in an environment where acquisitions money is decentralized into small pots controlled by dozens of selectors has brought the centralization issue home to collection development administrators. The high per-title cost of computer-based indexing and abstracting services requires either more extensive cooperation among selectors or the diversion of some discretionary resources into a central pool for subscribing to networked titles. One response to tightening collections budgets is to reduce the duplication of print titles in circulating collections of separate library units, thereby increasing the centralization of print resources on a given subject in one unit. System-wide online catalogs make duplication more apparent by displaying all the holdings for one title; they also make print titles at all units more accessible in every unit. Hence duplication seems less necessary. Reducing duplication of print titles saves money in the collection budget, and library users bear the increased cost of traveling among physically separate units to collect the materials they need.

The reality of a single online catalog for all the library's resources, despite their physical location, has increased undergraduate awareness of, and use of, the resources in subject collections in research libraries. This has spread the demand for undergraduate reference and instructional services across the library. Thus the online catalog is providing an opportunity, welcome in some units but not in others, to help undergraduates use the riches of specialized collections. Whether this change is an overall gain for undergraduates depends on the leadership and support of library administrators for serving undergraduates well across the system. Such a change will challenge academic departments that prefer to reserve the use of subject collections for faculty and graduate students. Effective service to undergraduates also requires a higher level of communication, awareness, and referral among individual units, a process aided by e-mail and the development of library- and campus-wide electronic lists and discussion groups.

The organizational changes necessary to adapt to an environment of constant change inevitably alter library services for undergraduates. As library administrators struggle to assign priorities to competing demands for limited resources, some resources must be allocated to the process of learning how to take advantage of the opportunities created by technological changes. At Cornell, some staff time has been transferred from providing direct services to implementing a service structure for the future. The direct service losses are apparent at the margins of traditional reference service: reductions in coverage of off-peak hours and changes in the staffing mix at service points. The gains will come in the form of increased effectiveness in reference and instruction in the networked environment. Integrating hands-on computerized instructional facilities

into instructional programs for undergraduates requires the development of new teaching strategies and new instruction materials. Librarians are also busy writing networked hypermedia instruction and reference tools that establish instruction and reference services in the virtual environment. New methods of digitizing and networking the reserve collections heavily used by undergraduates are under development.

The reference and stack collections used by undergraduates are evolving as well. Libraries are cutting subscriptions to print indexes and adding networked versions. Although the retrospective coverage of online indexing and abstracting services is still limited, each passing year makes that limitation less significant as the backfile of indexing builds. Reference monographs are less available in digital form. The bulk of the information and ideas that support the undergraduate curriculum is still available only in print form—in books and periodicals—but full-text, current-affairs databases have begun to erode the primacy of print, because these can deliver time-sensitive information more quickly. Multimedia versions of encyclopedias and dictionaries are more available. Publishers of scholarly journals and monographs are beginning to explore the unfamiliar terrain of the virtual library.

Substantial changes in the format of circulating collections await the decisions of scholars, libraries, and publishers on the future form of academic publication in the networked hypermedia environment. As all three groups explore, debate, and negotiate the future, foundations, universities, and the federal government are funding experiments in digitization and organization of knowledge. Much depends on the evolution of the faculty reward system, the extension of networked systems for peer-reviewing and publication, and the resolution of copyright issues. Discussions of altering promotion and tenure standards to include networked teaching, research, and publication are underway. It is a short step in the sciences from the fax-based reviewing system and the digitally based system that now generates printed journals to a fully networked system of review and publication. As Atkinson (1993) has pointed out, in the fully networked system for the recording and dissemination of scholarly information, the distinction between periodical and monograph disappears—a manuscript can be published as soon as it has passed muster. And the context-setting character that distinguishes monographs from periodicals will be replaced by a graduated continuum ranging from the least contextual research update to the most contextual, multilevel, richly linked document web that supplies more background and detail the farther the reader penetrates (p. 208).

Computers have become so central to undergraduate education that access to them has become a major issue. Providing access to networked computers is a significant new service in undergraduate libraries in the 1990s. Undergraduates use computers to write and print papers; send and receive electronic mail; and search indexes and catalogs, Web and gopher sites, and databases of their grades, class schedules, and work-study

openings. The library and the information technology unit in the university often share responsibility for making computer hardware and software available to students who cannot afford to buy them or who do not have a network connection. Extensive collaboration with computer professionals is crucial to giving all students the tools they need for their course work. Undergraduates are among the most computer-literate users in the university; librarians must be sure students have access to the virtual and the physical library and know how to use both effectively.

The presence of librarians and library services on the network must grow as the use of networked resources and services by undergraduates grows. Although it is too early to tell, it is possible that the importance of librarians on the network will rival the importance of the physical presence of librarians at reference desks and at public terminals. The situation is analogous to the coexistence of print and digital technologies in libraries. Librarians must have both technologies available to meet the educational needs of undergraduates. So, too, librarians will learn to balance the use of the physical and virtual environments to teach and deliver services. If real-time networked video and multiuser dimension systems become widespread and easy to use, librarians will be able to provide reference and instruction interactively and remotely when that is appropriate. By actively incorporating the virtual environment into the philosophy and geography of reference and instruction, librarians can expand the reach of their services and expertise.

CONCLUSION

The separation of undergraduate services and collections begun by the establishment of Lamont Library added impetus to the movement away from a single central library in large universities. The recent rise of networked hypermedia systems for the development, control, and dissemination of scholarly information and ideas has reversed that movement by linking collections and services that had been fragmented in physically separate buildings in university libraries. Services and collections are being recentralized in one location—the virtual library. Paradoxically, this new “location” and its constituents—the databases and the computers to view and use them—are more radically decentralized physically than any collection of buildings could possibly be because they are available at any network connection.

Separate undergraduate libraries continue to exist in some large universities. In others, services to undergraduates are not identified with a separate building. Undergraduates should be well-served in any library they use in the university and feel a sense of ownership of the whole library system. The reality is that the university, the faculty, the library system, and undergraduates themselves are split into many small, nearly autonomous, decentralized groups. The closest thing to a universal undergradu-

ate entity is usually the student newspaper and a library building they can call their own. Undergraduates need advocates in a large university library system, and they need services designed to accommodate their numbers and the way they use libraries and library resources. What works best in a given institution depends on many factors: institutional size and history, social patterns, library leadership, and user expectations, among others. The debate about the value of, and need for, separate undergraduate libraries will continue because there is no universal answer. The important point is this: undergraduates must be served and served well. Although the construction of the virtual library will change how librarians teach and how librarians organize access to resources, it will not change the basic tasks of managing recorded representations of human knowledge and experience and teaching students how to access it.

Under pressure to cut costs and improve undergraduate education, research universities and their library systems are testing a variety of strategies for making information and ideas available to undergraduates. These strategies often involve the merging, consolidating, and centralizing of administrative functions. Nearly all involve extensive technological upgrading that increases the need for centralized capital while decentralizing the production and delivery of information and ideas. Greater reliance on networked document delivery and coordinated reductions in duplicated print titles is reconcentrating print collections in subject collections. Research universities are betting on the future of cyberspace and the ability of librarians, teachers, and researchers to create, organize, and disseminate knowledge in new and more powerful ways to deal with the overwhelming growth of the knowledge base. It is becoming as important for librarians to be a presence on the network as at the reference desk and in the classroom. The challenge to librarians is to apply the instructional and organizational expertise gained from working with print-based information systems to the creation and maintenance of digital information systems that fully use the strengths of computer and communications technology and its worldwide infrastructure.

The spirit that animated the building of Lamont Library and the undergraduate library movement must be brought to bear on the challenges of the 1990s and beyond. Librarians must initiate research and a vigorous public debate on the effect that the reorganization of services and collections, the reallocation of financial resources, and rapid technological changes are having on the role of libraries in undergraduate education in the university. User studies are needed to document the effect of institutional changes on undergraduates and on the quality of the libraries that serve them. Increased awareness of how individual libraries are restructuring services and collections is necessary to maximize the effectiveness and minimize the damage inflicted by restructuring driven by financial pressures. No university library can afford to ignore the effects of the current changes on its undergraduate users.

REFERENCES

- Atkinson, R. (1993). Networks, hypertext, and academic information services: Some longer-range implications. *College & Research Libraries*, 54(3), 199-215.
- Braden, I. A. (1967). *The undergraduate library on the university campus*. Unpublished doctoral dissertation, University of Michigan, Ann Arbor.
- Braden, I. A. (1970). *The undergraduate library* (ACRL Monograph No. 13). Chicago, IL: American Library Association.
- Cordes, C. (1993). Low overhead costs. *Chronicle of Higher Education*, 40(December 8), A29, A34.
- Davis, M. E. (1994). News from the field: USC opens \$27.5M Leavy Library. *College & Research Libraries News*, 55(10), 629.
- DeLoughry, T. J. (1994). Term papers go high tech. *Chronicle of Higher Education*, 41(December 7), A23, A25.
- Dowler, L. (1992). *Lamont and Cabot: Gateways to the Harvard libraries and electronic information*. Unpublished discussion paper, Harvard College Library, Harvard University.
- Ehrenberg, R. G., & Murphy, S. H. (1993). What price diversity? The death of need-based financial aid at selective private colleges and universities? *Change*, 25(4), 64-73.
- Froomkin. (1993). Research universities face difficult choices. *New Directions for Institutional Research*, 15(3), 47-58.
- Hightower, M. (1993). Electronic age prompts redesign of libraries. *Harvard Gazette*, (March 26), 1, 10.
- Jensen, R. E. (1993). The technology of the future is already here. *Academe*, 79(4), 8-13.
- Kuhn, W. B. (1969). Undergraduate libraries in a university. *Library Trends*, 18(2), 188-209.
- Lee, S. (1993). Organizational change in the Harvard College Library: A continued struggle for redefinition and renewal. *Journal of Academic Librarianship*, 19(4), 225-230.
- Lowry, C. B. (1988). A convergence of technologies: How will libraries adapt? *Library Administration & Management*, 2(2), 77-84.
- Lyman, P. (1991). The library of the (not-so-distant) future. *Change*, 23(1), 34-41.
- McMillen, L. (1989). Escalating costs force private research universities to scale back academic, administrative operations. *Chronicle of Higher Education*, 34(August 16), A21-A22.
- Murray-Rust, C. (1993). Library users: Who are they and what are they doing here? *Kaleidoscope*, 1(10), 1-3.
- Person, R. (Ed.). (1982). University undergraduate libraries: Nearly extinct or continuing examples of evolution? A symposium. *Journal of Academic Librarianship*, 8(1), 4-13.
- Sliwa, S. (1994). Re-engineering the learning process with information technology. *Academe*, 80(6), 8-12.
- Terenzini, P. T., & Pascarella, E. T. (1994). Living with the myths: Undergraduate education in America. *Change*, 26(1), 28-32.
- Veaner, A. B. (1994). Paradigm lost, paradigm regained? A persistent personnel issue in academic librarianship, II. *College & Research Libraries*, 55(5), 389-402.
- Wilkinson. (1971). A screaming success as study halls. *Library Journal*, (May 1), 1567-1571.
- Wilkinson, B. R. (1972). *Reference services for undergraduate students: Four case studies*. Metuchen, NJ: Scarecrow. Reprint of Ph.D. dissertation, School of Library Science, Columbia University.
- Wilkinson, B. R. (Ed.). (1978). *Reader in undergraduate libraries*. Englewood, CO: Information Handling Services.
- Wingate, H. W. (1978). The undergraduate library: Is it obsolete? *College & Research Libraries*, 39(1), 29-33.