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Guest Editorial

Working Together for a Better Tomorrow

The 1995 holiday season was a very special one for my husband and me, and one we shall long remember. We had the opportunity to celebrate not only with our six-year-old granddaughter (and her parents) but also with our five-month-old grandson (and his parents). It was a time not only for rejoicing but also for remembering what is truly important in life and reassessing the value of our assorted enterprises.

Of what value, I might well question myself, are my efforts as Dean of Libraries and the Library and Information Science Program at Wayne State University to the future well-being of these precious young people or for the grandchildren of other men and women? And of what value are my efforts as ACRL President? In the greater scheme of things, does it really matter that ACRL has a new Strategic Plan? Surely my professional work must bear some relationship to what is most important in my life or I could not justify the level of investment I make in time and energy. So this is a special message for those of you who, like me, also question from time to time the value of your work as an academic or research librarian.

I believe now, as never before, that academic and research librarians have a strategic role to play in contributing to the well-being of current and future generations. Our abilities to organize, provide access to, and preserve information have always been of public value. However, the realities of the ever-expanding information glut of our data-rich/knowledge-poor society require more aggressive leadership on our part in order to ensure that people from all backgrounds and levels of society can locate, access, evaluate, and effectively use information to address the decisions and problems in their lives.

I cannot expect a good future for my grandchildren if they must live in a world populated largely by the have-nots. I also think that most librarians share in my belief of the potential value of their contributions to the well-being of individuals. (In all my speaking engagements, I have yet to find a single person who became a librarian for fame or riches!) Most of us entered librarianship because we had a work experience in a library that caused us to believe that, as librarians, we could make a positive difference in people’s lives. Of course, the constant budget cuts, the unending stream of half-awake students needing to be introduced to the research challenges of an academic library, and the necessary business aspects of library operations can weary us. And sometimes it is the seeming, or real, lack of appreciation for our contributions—particularly by faculty—that causes us to question the value of our efforts.

The latter is almost ironic given that, increasingly, leaders in K-12 and higher education are acknowledging the importance of resource-based learning that actively engages students in learning from the very information resources that will be available to them after graduation or drop out—when the lectures and the textbooks are no longer available. Last November, for example, California State University held a systemwide conference on information literacy, with faculty and librarians from all of its twenty-one campuses participating. But while there is
growing concern among higher education leaders for more active undergraduate learning (frequently prompted by state legislators' concerns for faculty productivity and businesses' demands for graduates who can communicate well and be effective problem solvers), many leaders still do not see the relationship between the role of librarians and improved undergraduate learning.

What can we do to make sure that our potential contribution will be called upon to improve undergraduate learning environments? What can we do as a professional association to enhance our collective contribution? My answer is the same as that recently expressed to members of the National Association of State University and Land Grant Colleges by its president C. Peter Magrath. In a December 1995 letter, Magrath called for an expanded focus on addressing state and local governmental relationships. Quoting from University of Virginia president John Casteen, he emphasized three points: (1) "unity within the state higher education systems is essential for public support," (2) national organizations must be willing "to work on a partnership basis with key state interests," and (3) "advocacy for higher education must attract third party supporters who will state our case because, in part, we are meeting their needs."

It seems that the dilemma of academic librarians parallels that facing higher education in general. Librarians have a lot to offer, but that potential will come to naught unless librarians can act in unity within states, unless we can work in partnership among our state and regional chapters and ACRL, and unless we can get other nonlibrarian advocates to champion our cause. What does this mean for individual ACRL members and for our association? Let me suggest a number of things.

First, our newly adopted Strategic Plan is right on target. Two of its four goals, developed by our membership, acknowledge that we must operate in the broader higher education and information policy environments, that we must help shape those environments, and that we must build partnerships to promote desired outcomes. Just as ACRL cannot accomplish the above goals without support from its members, another goal acknowledges that academic and research librarians from across the country need support—specifically in the area of continuing professional development—from ACRL. (The fourth and final goal commits us to be wise in the use of our resources in accomplishing our endeavors.)

Second, I believe that Magrath's comments speak to the absolute necessity of rethinking the relationship between ACRL and its chapters. We need to shake out the mental and historical cobwebs and clearly define what chapters want and need from ACRL and what ACRL wants and needs from its chapters in order to accomplish its membership's priorities as articulated in the Strategic Plan.

This defining process is far from complete. For example, just this fall a task force made up of two members from Chapters' Council and three members from the ACRL Governmental Relations Committee, and chaired by ACRL past-president Tom Kirk examined what can be done to streamline and strengthen the impact of ACRL's Washington efforts— their report was accepted by the ACRL Board at Midwinter and will result in changes for both groups. In addition, informal discussions have been taking place for over a year among Chapters' Council and ACRL leadership to define wants and needs—some of which are becoming clearer. The following is what I have been hearing:

**Chapters' Needs**
- Quality continuing education offerings that can be available at the state/regional level.
- Quality publications.
Information on a wide range of topics (many of these requests come from individual institutions).

- Good representation and good results in issues related to information policies and federal legislation that affects higher education and its libraries.
- Support in influencing state legislation and regional accrediting efforts.

**ACRL's Needs**

- A way to meet the continuing education needs of librarians and non-MLS library employees who cannot attend national conferences.
- Support from the state level on national policy and legislative initiatives.
- Support from the state level on regional accreditation initiatives.
- Proven chapter leadership to move into ACRL positions.

This informal list of chapters and ACRL's needs appears to be quite complementary; but the challenge will be to set up a relationship that facilitates productive interactions and that provides appropriate incentives. I believe that there is no more important challenge facing us than this.

Finally, I believe we need to take more seriously Magrath's call to unity. Historically, librarians have had little political clout. If we cannot come together for the common good—the common advancement of librarians as partners in the provision of quality education and economic development—then there is little hope for the realization of our potential contributions. While my particular focus is on academic and research librarians, the coming together must embrace librarians from all types of libraries. The respect, or lack thereof, that is accorded to school and public librarians has everything to do with how academic librarians are perceived and even more to do with how the information needs of people are met.

Elizabeth Martinez’s call for ALA to be the champion of people’s rights to intellectual participation should be our rallying cry. Can we do less than respond by emphasizing what we have in common rather than emphasizing our differences? I hope not; for, to a large extent, the quality of my grandchildren’s futures is dependent upon our response.

**Patricia Senn Breivik**

President, ACRL
Redefining the Status of the Librarian in Higher Education

Bill Crowley

Progress in the study of the role, function, and status of the academic librarian requires system-level analysis. Drawing on the field of higher education, this article seeks to avoid "individual blame" controversy through focusing on membership norms for the academic system and its librarian subsystem. Changes in the librarian subsystem are being advocated by influential higher-education theorists. Unless librarians secure peer status through adherence to core academic standards, the emerging era of electronic information will see a diminution in the librarian's influence over library affairs.

Productive exchanges over certain core aspects of the role, function, and status of the librarian within higher education are becoming increasingly more difficult to sustain. An almost tangible fatigue, resulting from years of intradisciplinary dispute over educational requirements, a perception of professional marginalization, and a discerned future of resource scarcity, seems to have negatively affected discourse in this critically important area. In her 1990 dissertation on the professional identity of librarians in American higher education, Jacquelin Marie Page addressed the emotions generated by the issue. Recognizing the personal unpleasantness that her research might evoke, Page avoided direct contact with academic librarians. Instead, she limited her information gathering to the content analysis of library school catalogs and job advertisements. The author's 1995 inquiry involved the status of librarians within research universities and drew responses ranging from the clearly reasoned to the explosively emotional. Passion by itself is no bar to inquiry; the vehemence of some of the replies to the author's American and Canadian surveys actually advanced his research effort. Nonetheless, much will be lost if researchers, concerned about the sensitivity of the topic, forswear investigations fundamental to understanding the place of the librarian within the academy.

Library and information science researchers have asserted that progress within the profession on critical issues often depends on outside intellectual assistance. In the specific case of academic libraries, the advantages are obvious: academic libraries are components of larger institutions. To study the forces that affect a college or university is to consider factors that affect its library. A second argument for calling on the resources of other fields and disciplines is the self-re-

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reflective character of research within library and information science. In this context, Jeffrey N. Gatten found a failure to make use of insights drawn from other specialties and disciplines. This inadequacy is not unique to library and information science. Levels of intellectual insularity affect virtually all disciplines and many research questions.

Higher education is a field focused on the realities of the academic enterprise. As such, it represents a critical resource for the study of university and college libraries. In 1985, George Keller reported that scholars trained in economics, psychology, politics, history, and sociology regularly contribute to the analysis of higher-education issues. Collectively, such research makes the higher-education literature extraordinarily useful for librarians with an interest in the perceptions of faculty and administrators.

Since the 1960s, a specific field of study called "higher education" has developed, now taught at some one hundred American and four Canadian institutions. Admittedly, most of the scholarship and opinion produced by this enterprise are ignored by academic presidents, deans, and other practitioners. Notwithstanding, the collective literature of higher education provides an excellent guide to the biases and truths that dominate the academic system. In this context, it can serve as a rich resource for those attempting to interpret, and perhaps improve, the academic subsystem inhabited by the librarian.

Of particular concern to the study of the status of the librarian within higher education are the following questions:

1. What are the characteristics of the academic system?
2. What are the characteristics of the library subsystem?
3. Do the characteristics of the academic system differ significantly from the characteristics of the library subsystem?
4. What, if anything, can or should be done about any differences between the academic system and the library subsystem?

At a future date, this researcher intends to provide an assessment of the place of the academic library in the Canadian system of higher education. The present analysis concentrates on the place of the library and librarian within the American academy.

Characteristics of the Academic System

The sheer size and complexity of American higher education confounds most efforts at generalization. In 1994, The Carnegie Foundation for the Advancement of Teaching identified 3,595 providers of higher education in the United States. Given the number and variety of colleges and universities listed by the Carnegie Foundation, full review of the American system of higher education and its librarian subsystem threatens a multivolume work. Fortunately, a useful replacement can be constructed through utilization of the higher-education phenomenon known as "upward drift." Briefly, upward drift is the historic tendency for community colleges to grow into four-year colleges, for teachers colleges to become universities, and for universities to increasingly emulate the Universities of Michigan or California. Given this pattern for development, the future of the American academy can often be discerned through review of innovations currently being implemented in its elite institutions. Descriptions drawn from observations of these eighty-eight Research Universities I and thirty-seven Research Universities II inevitably represent an amalgam of biases, perceptions, and facts. Burton R. Clark, in The Academic Life: Small Worlds, Different Worlds, described the system as consisting of hierarchies and miniworlds, where research dominates teaching, and institutions and departments vie in a never-ending search...
for prestige and power. It is a society where the teaching/research faculty and administration abide in precarious balance. Within the system, administrators guide, cajole, and reward through the allocation of tangible resources. Intangible rewards, such as praise and proclamations of ideological community, also are employed but with less effect. Particularly in the sciences, higher education is a competitive “culture of credit,” torn between collaborative ideals and the contest for influence and government grants.

Within departments, the research university is an environment where the goals of prestige in a discipline, institutional tenure, and the prerequisites of a full professorship are paramount. These are achieved through research renown, an adequate level of teaching effectiveness, appropriate institutional service, and the intense cultivation of senior faculty. It is the habitat of “The Ph.D. Octopus” and “The Ph.D. Squid.” It is also a well-established system where would-be participants put personal lives on hold for the years of study and research necessary to earn a doctorate. With increasingly rare exceptions, the Ph.D. and its equivalents are required of all players in the competitive arenas found at the heart of America’s leading academic institutions. Unless compensated for through extraordinary achievement in another context, lack of a doctorate equals life on the periphery of the research university.

Characteristics of the Library Subsystem
The condition of academic libraries on the eve of the twenty-first century is well documented in the library and information studies literature. Continued restrictions in funding and multiplying demands by scholars for access to electronic information are common to most accounts. In a response to the author’s 1995 surveys, one library educator—whose confidentiality was guaranteed as a condition of reply—asserted in an e-mail message of January 31, 1995, that:

the reality facing academic libraries today . . . is one of budgetary cutbacks and financial constraint. The literature is full of how research universities are struggling to cope with this reality—staff cuts and serials cancellations are two of the major ways. Organizational restructuring in academic libraries has resulted in flattening the managerial hierarchy.

In a 1987 essay in the American Scholar entitled “Libraries and Learning,” the historian Oscar Handlin described research libraries as fighting a losing battle to maintain collection comprehensiveness in a world dominated by hyperspecialists and narrow research interests. Among the problems Handlin saw were the waste of resources on purchasing little-used material and the loss of the library information monopoly because of the availability of information in electronic formats. Judging research library efforts to maximize use of scarce resources through collaboration and automation, Handlin concluded that salvation did not lie with either approach. He also saw librarians as central to the travails of the academic research library. Chief among the sins ascribed to librarians was a willingness to align “with presidents, deans, and provosts and too readily acquiesce in budgetary constraints.” In addition, librarians “are also excessively vigilant, on guard against interference by users whom they too often treat as adversaries rather than as allies.”
Differences in Academic System and Library Subsystem Characteristics

The sociologist Robert K. Merton described subgroups as "structurally constituted by those who develop distinctive social relations among themselves which are not shared with members of the larger group. All groups are potentially vulnerable to such sub-group formations." For the purposes of this exploration, Merton's remarks on groups and subgroups hold for academic systems and subsystems.

Exploring the differences between the academic system and the library subsystem requires an ability to recognize reality in unguarded moments. Burton R. Clark described academic power as involving "delicate fictions" and "ambiguous definitions," while stressing that "deans and provosts have enough to do without deliberately stirring up trouble for themselves." The use by administrators of both tangible and intangible assets has already been noted. Indeed, one might profitably study rhetorical support for the library ("heart of the university") in the context of administrative strategies for maintaining morale in a period of resource scarcity.

Occasionally, academic leaders will reveal a more equivocal perception of the librarian to nonlibrary audiences. Jacques Barzun, former dean of faculties and provost of Columbia University, tended to be supportive in the library press. His admonition that "scholars should be librarians and librarians should be scholars" is fairly well known. Less familiar to the profession may be his evaluation of the librarian's status in *The American University: How It Runs, Where It Is Going.*

In this major work, Barzun, writing as a higher-education theorist, termed librarians and journalists "intellectual middlemen" who confused "the assembling of items found here and found there" with true research. Characterizing librarians as "intellectual middlemen" tends to add to a campus climate that overlooks their contributions. But such mild disparagement usually lacks direct consequences for budgets and personnel rosters. More serious are forceful assertions that librarians do not possess the intellectual competence to manage library affairs.

In 1985, Frank Newman, president of the Education Commission of the States, authored *Higher Education and the American Resurgence,* an influential Carnegie Corporation Special Report. This work argued that libraries need to move from an emphasis on acquiring materials to accessing them wherever they are located, an assertion in accord with contemporary library theory. However, Newman avowed that academic librarians lack the capability to direct their institutions in a new electronic world. He stated:

Library personnel, while now fully competent to handle the library automation that has taken place, have neither the education nor the emotional commitment to prepare for the shift in outlook required to change from owning, cataloging, and lending, to becoming electronic data sleuths ready to link a student or faculty member to someone else's data bank. Moreover, the time has come for information specialists [nonlibrarians] to learn more about the needs of the library.

In light of such assertions, placement of academic libraries under associate provosts or vice presidents for information services represents more than administrative realignment. From a system-based perspective, it is a logical step in a process through which the academic system will assume more control over matters formerly left to the library subsystem. Although the occasional appointment of librarians to associate provost or vice president positions is to be welcomed, such developments do not minimize the reality of the changes being implemented. For the academic system, the provision...
of electronic information to faculty scholars now has new significance. As such, it will not be left to a subsystem whose dissimilar educational standards and variant operational norms complicate administrative and faculty understanding.

Addressing the Differences between the Academic System and the Library Subsystem

Discussions of differences between the academic system and the library subsystem inescapably involve consideration of the doctorate. This inevitability arises from the fact that the doctorate is a symbol that subsumes such other factors as research and teaching, even as it offers a possible basis for cooperation between librarians and teaching faculty. To illustrate the complexities involved, the author edited a defense of the librarian-as-manager from a response to his 1995 surveys. His intent was to compare the position of library director with that of education dean. The respondent wrote:

I differ strongly with your statement that library administrators [College of Education Deans] should have a PhD. It has never been proven satisfactorily that the doctoral degree is a prerequisite for effective leadership, vision, or even operational management. The primary function of a library director [College of Education Dean] is to lead, innovate, and advocate; it is no longer necessary (and in fact it never was necessary) to have a PhD to certify to the faculty that one understands their needs and can translate those needs into effective services and resources.21

Within the library subsystem, a doctorate is not required by subsystem norms. This fact is demonstrated by the substantial number of directors without doctorates in the ARL.22 However, lack of a doctorate is a serious problem within the larger academic system. Even in the relatively low-status field of education, the prospect of a dean substituting a master’s degree and management experience for a Ph.D. or Ed.D. degree verges on the incomprehensible. Deans frequently oversee multimillion dollar budgets and substantial personnel. Yet, particularly in areas related to the curriculum, deans are expected to have both administrative experience and the doctorate.

Research in communications and information diffusion suggests an additional complication for a master’s degree subsystem within a doctoral structure. With such disparity in educational levels, the potential for communication effectiveness is markedly diminished. Charles A. Schwartz argued that “academic librarians are strategically situated to be the main agents of electronic development of

Although the occasional appointment of librarians to associate provost or vice president positions is to be welcomed, such developments do not minimize the reality of the changes being implemented.

the scholarly information system.”23 However, studies of the diffusion of information, and the faculty’s own possessiveness regarding communication within disciplines, suggest otherwise. It is simply unrealistic to plan for a future where the teaching faculty cede such authority to librarians, unless librarians are viewed by faculty as peers or near-peers within the academic system.

Before considering whether the library subsystem should adopt the educational standards of the parent system, it is necessary to understand why librarians operate with required qualifications so different from those of the teaching faculty. From a system point of view, it appears that the subsystem developed along lines that limit the
doctorate as a resource for career advancement.

In a 1995 article entitled "The Opportunity Costs of Faculty Status for Academic Librarians," Bruce R. Kingma and Gillian M. McCombs examined the conditions necessary for librarians to maintain faculty status. They defined opportunity costs as costs that "represent the opportunities the individual or agency must forgo to achieve the desired output, although they include the actual dollar costs."

As noted elsewhere by Robert J. Branham:

The concept of opportunity cost is one of fundamental importance to the fields of economics and policy analysis. Benefits sacrificed from the best available alternative constitute the true cost of any action, and therefore should be at the center of all policy disputes.

Unlike the overwhelming majority of teaching/research faculty at research universities, new academic librarians are not required to have a doctorate in hand at the time of appointment. Employment and promotion within the library subsystem require a master's degree from a program accredited by the ALA and, eventually, a subject master's degree. There is little incentive for a librarian to devote the three to seven years of study necessary to earn a doctorate. The opportunity costs that count against doctoral study, including actual expenses, years of lost income, and full or partial withdrawal from the competition for internal or external promotions, simply outweigh the advantages gained. It is a matter less

of individual preference than of subsystem imperatives. The library subsystem sets the rules of the competition; intelligent players work the rules to their advantage. The library subsystem, with programmed regularity, thus sustains educational and other norms that differ substantially from those of the teaching faculty.

The general tenor of responses from academic library directors analyzed by the author in his 1995 study indicates an inability or unwillingness to align librarian educational standards with the norms of the academic system. A number of respondents cited a perceived inapplicability of the doctorate to library operations, a humanistic preference for collaborative work within the library over competition within the departments, and a lack of funding for adequate salaries as barriers to libraries meeting the educational criteria of the parent academic community. These same responses demonstrated general concern over the impact of financial constraints on library services. More specifically, academic library directors struggled with the effects of restricted funding for staff on the academic library's ability to meet growing faculty demands for electronic resources. To address these issues, the library directors stressed the need for increased funding from academic administrators and sought to develop in their staff the highest possible levels of electronic information expertise.

From a system point of view, increased funding and enhanced electronic expertise, though clearly needed, represent technical solutions for a problem colored by conflict between system and subsystem values. Bluntly stated, in a time of restricted resources and costly technological opportunities, libraries have a more visible status. Complaints about defects in academic library services, as documented in the higher-education literature and face-to-face discussions between administrators and faculty, have an impact on academic decision makers.
Problems in library subsystem operations, not just the amounts of library budgets, now command attention. Under the revised understanding governing electronic information access, either the library subsystem will negotiate a transformed relationship with the academic system or administrators following after Frank Newman will impose a revised relationship on the library.

Reshaping of the library subsystem by the parent academic system is now under way. The point under debate is whether the library subsystem will be an active participant in its own transformation. One method of testing the ability of the library subsystem to remake itself would be a formal reexamination of the value to librarians of the doctorate, the fundamental criterion for membership in the academic system. A first step in such a debate would be a proposal to require future directors of university libraries to possess a doctorate as a condition for institutional membership in ARL. Such a debate, although beginning with a specific issue, would provide an unmatched forum for exploring other areas where the library subsystem deviates from the academic system as a whole. If this doctoral requirement is actually adopted, there should be sufficient lead time to enable ambitious librarians to adjust their calculations of opportunity costs to fit new subsystem norms.

Arguably, adoption by the ARL of the requirement of a doctorate for university library directors will move academic librarianship as a whole toward the norms of the higher-education system. In this context, the working of "upward drift" within the academy should be recalled. Over time, doctoral qualifications for library directors at the research university would encourage similar changes at other levels of higher education.

It is a sociological and communications truism that subjective perceptions have real consequences. What is believed to be real is often more important than reality itself. Regardless of what academic librarians know about their actual value to faculty and administrators, the literature of higher education consistently portrays librarians as ancillary to the academic enterprise. In a period of restricted resources, higher education is being urged to develop priorities even among the teaching and research disciplines. Without a recognized claim to peer status and comparable treatment when resources are allocated, librarians will increasingly find life on the academic periphery to be no life at all as the hard decisions on funding and personnel are made.

Notes


20. Ibid., 152.
22. Marcia J. Myers and Paula T. Kaufman, "ARL Directors: Two Decades of Changes," College & Research Libraries 52 (May 1991): 241–54. Determination of how lower educational standards for directors "diffused" within the ARL membership requires an extended—and well­financed—analysis of the composition of candidate pools, the deliberative processes of search committees, and the motivations of university provosts and presidents. As such, it is beyond the scope of this consideration.


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Evaluating Commercial Document Suppliers: Improving Access to Current Journal Literature

Alice Duhon Mancini

This study examines the cost, access mechanisms, services, availability, and reliability of four commercial document suppliers: Faxon Finder, UMI, UnCover, and The Genuine Article. The author examined these suppliers in order to evaluate their ability to assist academic libraries in providing improved access to current journals. Results indicate that commercial suppliers provide preferable turnaround times at sensible prices. The commercial document suppliers studied in this project were able to fill an average of 76.57 percent of the total requests placed. The study found that commercial suppliers cannot replace traditional interlibrary services but do play an important role in an overall document delivery plan.

The journal price inflation and flat budgets that academic libraries are experiencing result in cancellations of journal subscriptions. These cancellations stimulate closer evaluation of the quality of services provided by interlibrary loan/document delivery units. The importance of high-quality document delivery services becomes intensified in libraries with flat budgets which are unable to keep up with inflation in the publishing industry. Interest in improving turnaround time for document requests and access to journal titles has caused many academic research libraries to evaluate commercial document providers and to define their role in the academic library environment.

The University of Tennessee at Knoxville’s (UTK) Interlibrary Services (ILS) unit provides document services to UTK faculty, staff, and students free of charge. During fiscal year 1993-94, ILS received 55,345 requests for lending and borrowing. This was a 20 percent increase over fiscal year 1992-93. UTK participates in OCLC and RLIN interlibrary loan (ILL) networks and, in 1993, became a member of Docline, the National Library of Medicine’s ILL network. UTK now orders approximately 25 percent of its article requests from Docline. UTK’s turnaround time for borrowing requests, from the day received in the ILS department to the time delivered to patron, is about two weeks. Concern for reducing turnaround time

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and the need to cope with the dramatic increase in business, partly as a result of improved bibliographic access from electronic indexes, caused the author to investigate additional document supply alternatives.

At the same time, UTK Collection Development librarians, along with their counterparts at other universities, sought new access options for patrons when a requested journal could not be purchased because of high subscription prices. As stated by MaryLou Goodyear and Jane Dodd, economic and political factors are affecting library collections nationwide: "Libraries have moved from a situation of budgetary stability to one of budget inventiveness." Library Journal’s “Periodical Price Survey 1995” predicts a 14.5 percent overall price increase in arts and humanities titles, a 16.1 percent overall price increase in social science titles, and a 16.6 percent overall price increase in science titles for 1996. Libraries have been forced to move from owning materials to accessing materials on a just-in-time basis. Just as Colorado State University reported in a March 1994 study, the UTK libraries are looking for “creative solutions to meeting the research need to identify and obtain journal articles.”

Many commercial document suppliers provide table-of-contents services in addition to document delivery. Utilizing commercial suppliers' table-of-contents services in conjunction with their document delivery services is viewed as a possible alternative to purchasing subscriptions. Further, commercial suppliers offer the possibility for users to order articles on a self-serve basis.

The author selected providers with broad coverage because of the wide variety of types of requests received by the ILS unit. The author evaluated several commercial document suppliers. She designed the study to help decision makers answer the following questions:

- Are commercial document delivery suppliers’ services necessary in an academic library setting?
- What special services do commercial document delivery suppliers offer that enhance access to titles not locally held?
- Which suppliers are the most appropriate for the University of Tennessee?
- Can commercial document services be integrated into traditional ILL units?

Method

UTK selected the following suppliers for this study: University Microfilms Incorporated (UMI) (15,000 titles), Institute for Scientific Information’s The Genuine Article (TGA) (7,000 current titles and 3,500 retrospective titles), Carl’s UnCover (16,000 titles), and Faxon Finder (11,000 titles). The author selected providers with broad coverage because of the wide variety of types of requests received by the ILS unit. The author established deposit accounts with UMI ($2,000), TGA ($3,000), UnCover ($3,000), and Faxon Finder ($500). She began utilizing these special accounts on September 12, 1994,
and continued through December 15, 1994.

The selected commercial suppliers provided access to current titles only (with the exception of TGA), thus this study did not deal with the totality of journal requests received by the UTK ILS department, but only those requests from 1990 to the present. The criteria used for selecting articles to be ordered from commercial suppliers were as follows: (1) item was not held by UTK libraries; (2) item was not accessible via electronic full-text databases; and (3) item was not available through Docline. The UTK libraries' ILS unit orders all medicine-related titles through Docline. As the project proceeded, the author slightly altered the criteria and ordered several medicine-related articles from commercial suppliers instead of through the Docline system. This was necessary to increase sample size.

The study tested several hypotheses: (1) commercial document suppliers offer quicker turnaround time than the ILS 14-day average; (2) commercial suppliers offer cost-effective service and improved access to titles that some academic libraries cannot afford to purchase or have been forced to cancel; (3) the reproduction quality of commercial documents is acceptable; (4) suppliers would offer easy access and ordering without unnecessary procedures; (5) academic libraries need commercial suppliers' services to supplement ILL document-ordering services; and (6) the ease of use of table-of-contents services, which offer direct-article ordering, provides enhanced access to important titles not held by the library.

The author ordered articles from the selected commercial suppliers in various ways. Faxon and UnCover have only one ordering method. Users must telnet to the database and utilize the table-of-contents services and select the desired articles from the table of contents. UMI allows direct ordering via phone, fax, telnet, Datastar, OCLC, DIMDI, and ISM. For the simplicity of this study, all orders for UMI and TGA were faxed directly to the company and indicated the preferred delivery method on the order form.

Statistics kept for this project included the number of days between ordering and receipt of document for both fax and U.S. mail delivery. The author also kept statistics on the cost of each article and evaluated electronic- and fax-ordering mechanisms provided by the commercial suppliers. She recorded data on the commercial suppliers' ability to fill requests from their published list of titles. In addition, she noted the customer service attitude of each commercial document supplier employee encountered during the study and judged the quality of the copies received. The last major category of data collection was staff time utilized to process requests in comparison to traditional ILL ordering methods. Calculation of staff time was subjective because individual requests take differing amounts of time to process; therefore, the author collected data on any additional procedures that are not part of traditional interlibrary loan methods, such as sorting and scanning paper title lists.

Results

Availability of Articles

Each of the suppliers produces paper lists of the titles from which it fills requests. The author checked these published title lists to verify availability from the suppliers prior to ordering 100 percent of the articles in this study. The suppliers were able to fill a total of 76.57 percent of the requests submitted. The reasons given for not supplying a request included canceled subscriptions, publisher forbids copying, and "cannot supply." Low order numbers for Faxon may be attributed to the fact that many of the Faxon titles were not among those requested by ILS users. The author spent much effort and
TABLE 1
Fill Rates for Commercial Suppliers

<table>
<thead>
<tr>
<th>Supplier</th>
<th># ordered</th>
<th># received</th>
<th># unfilled</th>
<th>% filled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faxon</td>
<td>17</td>
<td>6</td>
<td>11</td>
<td>35.29</td>
</tr>
<tr>
<td>UMI</td>
<td>52</td>
<td>50</td>
<td>2</td>
<td>96.16</td>
</tr>
<tr>
<td>TGA</td>
<td>39</td>
<td>21</td>
<td>18</td>
<td>53.85</td>
</tr>
<tr>
<td>UnCover</td>
<td>67</td>
<td>58</td>
<td>9</td>
<td>86.57</td>
</tr>
</tbody>
</table>

Total filled during project = 135
Total requested during project = 175

Fill rates, cost, and turnaround time are good ways to evaluate document delivery providers. Commercial suppliers’ filled percentages vary greatly from supplier to supplier. UMI and UnCover had high fill rates, 96.15 and 86.57 percent, respectively, and were usually able to provide what they advertised. Faxon and TGA had much lower fill rates, 35.29 and 53.85 percent, respectively, and had difficulty providing items from their current title list. The author conducted further analysis regarding the citations unfilled by suppliers. She determined whether the unfilled titles represented a certain subject area or were produced by the same publisher (see table 1). She found that the articles seemed to be distributed evenly in several subject areas. Results showed no subject patterns or publishing similarities. Each unfilled title was produced by a different publisher, with the exception of Elsevier, which published two of the unfilled titles. These data show no specific trends relating to commercial suppliers’ ability to provide services.

Cost
Cost analysis is crucial when considering the use of commercial services. Some of the types of administrative costs incurred to provide and obtain interlibrary loans include: search fees, staff time, copy costs, telecommunications charges, and postage. Many ILL units charge fees for their services, and most charge added fees for rush or fax service. UTK ILS has over one hundred reciprocal agreements in which no fees are charged between ILS lending and borrowing units. Staff members attempt to obtain as many items as possible from these reciprocal libraries. Academic institutions usually operate with a fixed budget, so taking steps that may cause cost increases must be evaluated prior to decision making. In 1990, the average cost among ARL members to borrow an item through ILL was $18.62; the average cost to lend an item through ILL was $10.93. The total cost including borrowing and lending was $29.55. The ARL average includes administrative overhead. These statistics show that traditional ILL services are costly for both borrower and provider.

A sample of 200 invoices from UTK’s February 1995 ILL invoices shows that the average charge per article borrowed was $7.59. This is only an average of those articles UTK was billed for and does not include those received from reciprocal libraries, nor does it include any administrative overhead. The article charges for the document suppliers in this study do not include administrative overhead.

Some commercial suppliers, such as UMI, charge a flat fee for document services (see tables 3 and 4). Others, such as TGA, Faxon, and UnCover, charge a base
fee plus a copyright fee determined by the publisher. Copyright fees can be quite high. The highest copyright fee encountered during this study was $23 for a single article.

Faxon and UnCover offer fax delivery only; UMI and TGA offer fax, express mail, and regular mail delivery options. The author recorded costs for fax delivery and regular mail delivery for this project because these are the methods of delivery currently used by UTK’s ILS staff.

Table 3 shows the charges for fax delivery from the four suppliers surveyed in this study. Some suppliers that offer delivery options charge an additional fee for fax delivery. UnCover and Faxon, which deliver only by fax, have a higher base rate. Immoderate copyright fees attached to specific articles caused the highest article charges of this study. The issue of publisher copyright fees is important when selecting suppliers because each supplier has a different pricing schedule. Some suppliers charge the copyright fee directly back to the patron, and some, like UMI, charge a flat fee and equalize the copyright fees across the board. Although some of the article charges found in this study were high, the averages were not necessarily prohibitive.

**Turnaround Time**

Turnaround time is a traditional measure used to evaluate quality of service in ILL departments. The average turnaround time for an article to go through UTK’s ILS system is thirteen days. One additional day is added for processing and delivery, equaling fourteen days.

The higher numbers for turnaround time by UMI and TGA are because the suppliers did not mail the article to the address given on the order form. Instead, they mailed the article to another address attached to the account code. One of the purposes of this study is to begin to explore end-user document delivery options. The addressing issue might create potential problems if individual patrons placed orders directly using an ILS account number.

Low average turnaround times for the commercial suppliers suggest that the additional charge for commercial delivery is justified. Average fax delivery for all suppliers was between one and three days (see table 5). Average U.S. mail delivery was five to six days, which is an improvement over UTK’s average interlibrary turnaround time (see table 6).

**Staff Time**

ILL procedures at the University of Tennessee are delegated among staff and student assistants. Because of the large volume of requests (55,345 in 1993–94), routine procedures such as processing, pulling paperwork, and keeping statistics are largely completed by students. Other, more complex parts of the process are performed by staff. The routine is much like

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**TABLE 3**

<table>
<thead>
<tr>
<th>Cost Per Article for Fax Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

---

**TABLE 4**

<table>
<thead>
<tr>
<th>Cost Per Article for Mail Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

*This high number is due to a $23.99 copyright fee placed on the Elsevier title *Water Science and Technology*. TGA’s average, excluding articles from *Water Science and Technology*, is $18.51.
March 1996

### TABLE 5
Arrival Time for Fax Articles (in days)

<table>
<thead>
<tr>
<th></th>
<th>Faxon</th>
<th>UMI</th>
<th>TGA</th>
<th>UnCover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>1.72</td>
<td>2.63</td>
<td>2.82</td>
<td>3.25</td>
</tr>
<tr>
<td>High</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Low</td>
<td>0*</td>
<td>1</td>
<td>2</td>
<td>0*</td>
</tr>
</tbody>
</table>

*0 indicates articles received on the same day the order was placed.

Many ILL units charge fees for their services, and most charge added fees for rush or fax service.

During this study, differences in tracking and ordering mechanisms caused an increase in the staff time required to manage items ordered from commercial suppliers. This is because procedures for these new systems were not part of the established work flow.

Of the four suppliers chosen for this study, only two, UMI and TGA, have their holdings in OCLC. In order to verify availability from UnCover and Faxon, the author scanned paper title lists supplied by the vendor. This procedure was more time-consuming than searching OCLC. A better method, such as scanning a local electronic database or encouraging all suppliers to place holdings on OCLC, would make it easier for ILL staff to incorporate commercial suppliers into existing routines.

These problems are by no means insurmountable. If commercial suppliers such as UnCover and Faxon are added to UTK’s list of suppliers, procedures and work flow would need to be reorganized. Utilizing commercial suppliers also would require developing a more efficient way of verifying which supplier holds which titles. This reorganization would be similar to the procedural changes initiated when an interlibrary loan unit adds a new system to its current list of ILL systems. For example, many procedural changes resulted when UTK added Docline to its list of ILS systems. After just a few weeks, the staff incorporated the necessary procedural changes into the regular work flow.

### Access Options
Suppliers offer a variety of methods for accessing their titles and services. UMI and TGA allow fax ordering and provide paper lists or catalogs of titles held. Both also provide request options through OCLC’s FirstSearch and Dialog. UnCover offers free public access to its database through the Internet. UnCover does not accept fax or mail requests but does deliver by fax only. UnCover users may set up deposit accounts or use credit cards. Faxon requires institutions to set up a deposit account with password-protected access to its database and ordering system. After the account is set up, Faxon clients may telnet or set up a dedicated line with Faxon search software. UTK libraries’ interest in evaluating the table-of-contents services and end-user ordering features provided by these commercial suppliers led to the librarian’s brief analysis of the table-of-contents services available for TGA, UMI, Faxon, and UnCover.
The librarian evaluated the table-of-contents order systems used by Faxon and UnCover, and compared the basic features to OCLC's ContentsFirst database. ContentsFirst, an OCLC FirstSearch database, offers access to the FirstSearch "Order" option, of which UMI and TGA are suppliers. Each of these three services offers title and issue browsing, keyword searching, and onscreen instructions, and is available through the Internet. The main difference between these services is that Faxon and UnCover allow patrons to order items that are not listed in the table-of-contents databases, whereas ContentsFirst does not.

Quality
The author judged the quality of fax copies to be acceptable to good. The only complaints received from patrons were for fax copies from journals that had text printed on photographs. Poor quality cannot be prevented in this situation. There was no significant difference in quality from vendor to vendor.

The author also judged the quality of photocopies to be acceptable to good. The best quality documents received were tearsheets from TGA. If the original contains complex graphics, tearsheets can be the most effective method for the patron to obtain a high-quality copy.

Conclusions
Document suppliers provided a better turnaround time than the traditional ILL methods used by UTK. Although suppliers are not always as quick as they advertise, five days for mail delivery is a considerable improvement over fourteen days. This is good news for ILL departments trying to speed up turnaround time. However, all article delivery cannot be replaced by commercial suppliers, because they generally provide access to current journal literature only. TGA's retrospective journal access is limited to scientific titles. Commercial supplier fees are higher than UTK's ILS department normally pays but are not prohibitive (see tables 2 and 3).

The discrepancy between services that commercial suppliers advertise and those they actually provide needs to be noted. The inclusion of titles from which publishers do not allow photocopying is misleading to users of these services. Commercial suppliers' filled percentages vary greatly from supplier to supplier. This is certainly an indication of the currency of the suppliers' lists of available titles. It also is a copyright issue. Some publishers do not allow photocopying of articles; therefore, when tearsheets have been sold, the articles are unavailable. This generally means that tearsheets only are allowed. These limitations are not made clear by the commercial suppliers.

Another discrepancy found is the suppliers' inconsistency in fulfilling the promised 24-hour fax turnaround time. None of the suppliers tested consistently fulfilled this promise, but the average fax delivery times were all within one to three days (see table 5). Although some interlibrary lenders can provide equivalent turnaround times and immediate fax delivery, service is at times inconsistent because of staff shortages and equipment problems. All ILL units are not equivalent, and many are not set up to provide immediate delivery. Sending requests for current journal titles to commercial document suppliers may help to get the documents in the patrons' hands more quickly.

| TABLE 6 |
| Arrival Time for Mail Articles (in days) |
|---|---|---|---|
| Faxon | UMI | TGA | UnCover |
| Average | —* | 5.74 | 5.76 | —* |
| High | — | 20.00 | 16.00 | — |
| Low | — | 3.00 | 3.00 | — |

*Faxon and UnCover deliver by fax only.
Although commercial suppliers consistently offer faster turnaround time than traditional ILL methods, there are some limitations. Document suppliers should be evaluated individually by each library prior to selecting a provider. The services that combine ordering with table-of-contents services give an enhanced level of access different from bibliographic databases. Users may view this enhanced level of access as a viable alternative to purchasing that title. Each commercial supplier provides different services and modes of access to different groups of titles. Requests for specific journal titles vary from library to library depending on the degrees offered by that institution. Requests also vary depending on the specific research needs of the faculty, staff, and students. This study shows that the services and titles offered by UMI and UnCover coincide with the needs of the UTK ILS unit.

Future of Document Delivery
This study shows commercial document suppliers to be a viable supplement to traditional ILL activities. Utilizing commercial suppliers may give ILL departments more document access options without placing an unfair burden on any one library. Commercial suppliers seem to be particularly helpful when ordering multiple articles from a specific journal. UTK also is interested in the potential to provide self-service delivery to patrons who need rush services. Brown University’s “Express” delivery service is one example of self-service, customer-paid document service. Because the author found the delivery and access mechanisms to be acceptable, further investigation in setting up these services can now proceed. If usage of commercial suppliers increases at UTK, cost-reduction options are available. Some suppliers, such as TGA, offer volume discounts for ordering a certain number of articles per year. This can be advantageous for all parties.

Using multiple commercial document suppliers presents some unique problems. One of the difficulties is being able to access title lists quickly and efficiently. A related problem is figuring out an efficient way to decide which titles will be ordered through which suppliers and which titles will be ordered through interlibrary loan. The two methods available for ILS to verify whether a title is held by a commercial supplier are: (1) searching OCLC (if a supplier lists its holdings), and (2) wading through paper title lists or scanning online lists. One solution to these problems is to create a local database that merges these different types of data. At the University of Tennessee Libraries, the Networked Services Team is developing a database called Mockingbird (accessible through the World Wide Web). Mockingbird mimics other journal resources but contains more information specific to UTK’s holdings and document needs. The database links journal titles and abbreviations with ISSNs to other information such as preselected location strings for those titles available from reciprocal libraries. Other crucial data to be included in the future are availability from document suppliers and full-text online availability, including Dialog file numbers and FirstSearch full text. The long-range plan is to link Mockingbird to the catalog so users can obtain the most up-to-date, complete holdings information. Another facet of the long-range plan is to link Mockingbird to CD-ROM products held by libraries so that users can verify UTK’s holdings and receive information on the availability of titles not held by UTK. Mockingbird has tremendous potential value for many library functions,
including interlibrary loan, collection development, acquisitions/serials, and reference.

As a result of the findings of this study, the author recommended expanded use and continued evaluation of commercial suppliers. Similar to the conclusions in Wayne Pederson and David Gregory's November 1994 article, commercial suppliers cannot replace traditional ILL, but they can enhance the productivity and flexibility of current services and increase user access to many necessary titles.  

Notes

Thanks for your support

ACRL thanks these corporate colleagues for their financial support of its activities and programs throughout the year.

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- Elsevier Science, Inc.
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Materials Budgets in the Electronic Age: A Survey of Academic Libraries

Frank R. Allen

Academic libraries face a host of expenditures for products and services, which, though not materials per se, provide access to materials. The extent to which libraries fund these services through materials budgets is the focus of a survey of academic librarians in the United States and Canada. In September 1994, the author sent questionnaires to the head librarians of 230 academic libraries. The survey generated a 76.9 percent response rate. Over two-thirds of the respondents indicated they allocate less than six percent of their materials budgets to non-data resources. Seven out of ten respondents agree, however, that it is natural for materials budgets to absorb certain technology costs. In addition, only 23 percent think that materials budgets should be limited to materials in a traditional sense. These findings suggest that most librarians are continuing to allocate materials budgets in a traditional manner, while recognizing the inevitable shifts in allocation of scarce resources.

The evolution of the electronic library is forcing librarians to examine critically how to allocate scarce financial resources in academic libraries. Libraries face growing outlays for products, systems, and services in support of electronic access and delivery. Examples include computer software, computer hardware, file storage costs, software and hardware maintenance, preprocessing and servicing, and licensing fees. Because they are relatively new phenomena, these services typically have little, if any, dedicated funding. Therefore, librarians are looking for ways to pay for these new services. Do librarians fund these nontraditional expenses from the materials budget, operating funds, outside funding, or some combination of all three sources? The traditionalist may object to using the materials budget on the grounds that it is philosophically inappropriate as well as ill-timed, given the erosion of purchasing power from two decades of serials inflation. Others may object to using the operating budget if it crowds out essential operating needs. If the library is not able to find the funding internally, it faces the task of persuading campus or outside agencies to support these needs. In an era of higher-education downsizing, this can be a challenge. Furthermore, campus budget offices and outside agencies do

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not always comprehend this library transformation and the resulting shift in funding requirements.

**Literature Review**

A ten-year retrospective review of library and information science literature reveals a widening arc of discussion on the resources appropriately funded through the materials budget. Several position papers published in 1986 and 1987 discuss the practice of funding online search costs through the materials budget. Jay Martin Poole and Gloriana St. Clair argue that online search costs deserve a place in the materials budget by satisfying legitimate educational and research needs. The practice should be only a temporary measure, however, until library administrators are able to secure separate and permanent funding for online searching.\(^1\)

Sheila Dowd, John Whaley Jr., and Marcia Pankake offer three opposing arguments. Dowd equates providing online search services with spending money on multiple reserve copies. Every dollar librarians divert from acquisitions to online searches is money that will not be available to build a broad and balanced array of titles.\(^2\) Whaley argues that the practice of funding online searches from materials budgets has little to do with philosophy in most libraries. When funding is tight, he points out, librarians can more easily tap materials budgets funds than heavily encumbered operating budgets, thus making this a pragmatic process.\(^3\) Pankake agrees with Whaley and adds that materials budgets are vulnerable to "raids." She asserts that librarians are confusing the provision of access with the provision of information. Both activities are proper missions of the library, but each should have separate funding sources.\(^4\)

In a 1987 follow-up to the 1986 C&RL articles, Ann Bristow Beltran suggests that the underlying remote database from which an online search is extracted is itself a reusable resource. By charging remote database costs to the materials budget, librarians are helping to fund this resource and continue its availability.\(^5\)

In 1990, Peggy Johnson surveyed members of the ARL on issues related to trends in materials budgets and published her findings in *Materials Budgets in ARL Libraries*, SPEC Kit #166.\(^6\) She reports that libraries are using materials budgets in the following ways: computer files such as diskettes, mainframe tapes, and CD-ROM (87% of respondents); remote database searching costs (32.9%); and computer hardware (15.2%). The study also surveyed librarians on the funding sources for materials budgets in their libraries and on which persons in the organization make allocation decisions.

In a 1993 article, Ross Atkinson asserts that the acquisitions budget should be integrated into the broader library and institutional budgetary process.\(^7\) He suggests that the success librarians have enjoyed in protecting the purchasing power of materials budgets may be draining potential resources away from other library operating needs. He points out that libraries cannot thrive and prosper by increasing materials budgets alone, as if to say that information can be made accessible by merely purchasing it. Ironically, he argues, this channeling of resources exclusively into acquisitions budgets may now be working to the detriment of information services as a whole.

Nancy Eaton discusses financial issues related to collection development in an address at the 1993 Advanced Collection Management and Development Institute.\(^8\) She argues that the key to providing additional library funding is in developing greater cooperation among university libraries, media centers, computing centers, and telecommunications centers. This will in turn create economies of scale, less redundancy, and opportunities for departmental specialization. Eaton suggests that librarians need to harness automation synergies on campuses. Campus partners are not necessarily operating in a zero-sum environment in which
one unit's gain automatically creates another unit's loss.

In a 1994 article, Jerry Campbell argues that the advent of technology applications in libraries necessitates the need for an entirely new budget model. In the early days, libraries successfully funded incremental advances in automation. However, the scope of funding needs for technology is now too great to absorb without a fundamental change in how librarians allocate resources. Given what he characterizes as the aversion most librarians have to drastic change, he proposes that they devise transitional budgets that reduce expenditures for personnel and print-on-paper, and correspondingly increase expenditures for technology and electronic distribution of information.

Design and Response
The literature survey produces a wealth of relevant position papers, but few reports of actual practice. This paper reports on the findings of a survey that measured how academic libraries currently allocate materials budgets and, specifically, to what extent libraries are using acquisition funds for what will be referred to as "materials support resources." Materials support resources are defined as those services and products that directly facilitate access to, and delivery of, information but do not represent analog or digital collection material. The survey also measured academic library heads' opinions on how libraries should be allocating scarce resources in an ideal scenario.

Asking librarians to reveal the extent to which they are spending "materials" budgets on items other than materials is somewhat forward and increases the possibility of a low-response rate. In an effort to ensure a meaningful response rate, the author utilized a formula-driven approach established by Don Dillman in his work Mail and Telephone Surveys: The Total Design Method. After extensive drafting, reviewing, and pretesting, the author sent the final survey to the heads of 230 academic libraries in the United States and Canada in September 1994. This target audience consisted of the 122 academic libraries surveyed biennially by the ACRL and the 108 academic members of the ARL. Respondents returned 177 surveys for a response rate of 76.9 percent. Survey results and a secondary analysis with separate responses for ARL and ACRL libraries are available from the author upon request.

Findings
Background Characteristics
Some background information on the demographic profile of the respondents helps to frame the survey data. Question one asked respondents to indicate the size of the library's materials budget. Approximately 55 percent of respondents reported a budget size of less than $3 million. These libraries are referred to as "smaller libraries." The remaining 45 percent of the survey population reported a materials budget size of at least $3 million. These are referred to as "larger libraries."

Materials support resources are defined as those services and products that directly facilitate access to, and delivery of, information but do not represent analog or digital collection material.

Knowing who responded to the survey may help the reader better appreciate the answers to opinion questions. Question eighteen asked respondents to identify their title within the library. Slightly more than 72 percent of respondents identified themselves as either deans, directors, university librarians, or campus heads of information technology. The remaining 18 percent identified themselves as either assistant/associate directors, heads of collection development, heads of administrative services, or heads of acquisitions, in that order of frequency.
Question eight asked respondents to identify their parent institution affiliation. Roughly two-thirds, or 65.7 percent, of the survey population reported their institution to be state supported, whereas 34.3 percent reported their institution to be privately supported. Therefore, the survey population reported their institution to be state supported, whereas 34.3 percent reported their institution to be privately supported.
Use of the Materials Budget

The survey defined the term materials budget as that pool of funds used in the library to acquire and provide access to materials and sources of information. Question 2 asked what types of expenditures the library’s materials budget funds. The question is restated here because of its importance to the study:

Q-2. For the most recent fiscal year, how many of the following types of expenditures were funded out of the materials budget? Circle as many as are applicable (circle number).

1) Monographs
2) Serials and Journals
3) Films, Videos, Sound Recordings, Microforms
4) Computer Readable Text, Indexes, Abstracts (CD-ROM, mainframe tapes, disks)
5) Remote Database Searching (online search costs)
6) Application Software for Patron Education
7) Computer Hardware (public access catalog terminals or PCs, CD-ROM workstations, hardwiring costs, campus mainframe computers to support OPACs)
8) Computer Hardware Maintenance (vendor contracts or repair)
9) Computer Software to Facilitate Materials Access (loaders, drivers, etc.)
10) Computer Software Maintenance (vendor contracts)
11) Materials Preprocessing and Servicing (OCLC, SOLINET, etc.)
12) Binding and Preservation
13) Interlibrary Loan Expenses (copying charges, loan charges, other)
14) Membership Dues in National or Regional Library Networks
15) Wages (please specify which departments)
16) Other (please specify, if possible)

Virtually all respondents are purchasing monographs, serials, and audiovisual materials from the materials budget. Approximately 99 percent of respondents are funding computer-readable text and indexes (CRT in figure 1) from the materials budget, whether it be CD-ROM, mainframe tape, or floppy disk media. Roughly forty-three percent of respondents are funding remote online search service (OSS) costs through the materials budget. Thirteen percent of respondents are charging the cost of application software (Educsw) to the materials budget.

Thirteen and 12.4 percent, respectively, of respondents fund hardware (HWare) and software (Sware) through the materials budget. Seven and nine percent, respectively, fund hardware (Hmaint) and software (Smaint) maintenance costs through the materials budget. Thirty-nine of the 177 survey respondents, or 22 percent, charge one or more of the aforementioned four automation-related expenditures to the materials budget. Only six respondents, or 3.4 percent, charge all four of these expenditures to the materials budget.

Roughly one-quarter (23.2%) of libraries charge the costs of materials preprocessing (PrePro) to the materials budget. Seven out of ten (70.6%) respondents charge binding and preservation (B&P) costs to the materials budget, reflecting an established practice in academic libraries. One-third of libraries charge interlibrary loan expenses to the materials budget. Slightly more than one-third (36.7%) charge membership dues to the materials budget. Only 3.4 percent pay wages from the materials budget. A handful of respondents wrote under “Other” that they charge document delivery costs to the materials budget.

Figure 1 shows the results in question two partitioned by library budget size. Larger libraries are slightly more likely than smaller libraries to charge remote OSS costs to the materials budget, by a margin of 47 to 40 percent. Larger libraries are twice as likely as smaller libraries to charge dues for consortial networks to materials budgets. Smaller libraries show
In questions three and four, the author asked respondents to limit their answers to the subset of items numbered seven through sixteen in question two. These items constitute that set previously defined as the library’s materials support resources. The results show that 12.1 percent of libraries charge none of these costs to the materials budget. Fifty-nine percent allocate trace to six percent of the materials budget to these costs. Twenty-eight percent of libraries spend at least six percent of the materials budget on materials support resources.

The data show that academic libraries overwhelmingly depend on university entitlements for funding of materials budgets and that, as a group, libraries generate very few independent funds.

Regression analysis reveals no statistical correlation between budget size and the degree to which the materials budget is spent on materials support resources. With budget size set as the independent variable (X) and data from question three set as the dependent variable (Y), the analysis produced an r-squared value of less than .05. This suggests that less than five percent of the variation in the answers to question three is attributable to how the respondent answered question one. The analysis is limited in that it uses ranges of values rather than data points. The significance of this factor is unknown but would logically contribute to a lower r-squared value.

Table 1 segments the data from question three by institution size and type. Larger public institutions are slightly more likely than the group as a whole to fund materials support resources from the materials budget, whereas larger private libraries are the least likely. Fully 45 percent of larger private institutions spend none of their materials budgets on materials support resources. This does not suggest that size and affiliation are statistically predictive of spending behavior, but this may be a meaningful observation when viewed as part of an overall pattern.

In answering question four, survey respondents indicated to what extent they are dedicating a greater or lesser amount of their materials budget to materials support resources than they were three years ago. Slightly less than two-thirds (62.9%) of the respondents responded that they spend about the same amount propor-

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### TABLE 1

<table>
<thead>
<tr>
<th>Percentage of Materials Budget Spent on Materials Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger Public</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Less than 3%</td>
</tr>
<tr>
<td>3.0% to 5.9%</td>
</tr>
<tr>
<td>6.0% to 8.9%</td>
</tr>
<tr>
<td>9.0% to 11.9%</td>
</tr>
<tr>
<td>Over 12%</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Number in set (N) N=55 N=20 N=57 N=38 N=173

'Several institutions did not identify size and type. Figure in this column is total number of institutions that answered the question.'
Materials Budgets in the Electronic Age

### TABLE 2
Percentage of Materials Budget Spent on Materials Support
Rate of Change Last Three (3) Years

<table>
<thead>
<tr>
<th>Ratios of Change Last Three Years</th>
<th>Larger Public</th>
<th>Larger Private</th>
<th>Smaller Public</th>
<th>Smaller Private</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stayed about same</td>
<td>63.6%</td>
<td>73.7%</td>
<td>64.9%</td>
<td>55.6%</td>
<td>62.9%</td>
</tr>
<tr>
<td>Increased</td>
<td>25.5%</td>
<td>15.8%</td>
<td>19.3%</td>
<td>27.7%</td>
<td>23.6%</td>
</tr>
<tr>
<td>Increased significantly</td>
<td>5.4%</td>
<td>10.5%</td>
<td>7.0%</td>
<td>13.9%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Decreased</td>
<td>5.5%</td>
<td>0.0%</td>
<td>8.8%</td>
<td>2.8%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Decreased significantly</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Number in set (N)</td>
<td>N=55</td>
<td>N=19</td>
<td>N=57</td>
<td>N=36</td>
<td>N=170+</td>
</tr>
</tbody>
</table>

*Several institutions did not identify size and type. Figure in this column is total number of institutions that answered the question.

Table 2 partitions the data from question four by institution size and affiliation. The differences are generally slight. Larger private libraries are the least likely to have increased or increased significantly the percentage of the materials budget spent on materials support resources in the past three years. This is logical given that 45 percent of larger private libraries are not utilizing any of the materials budget for materials support resources.

**External Factors**

Questions five, six, and seven examined some of the external factors that may be influencing how libraries allocate materials budgets. In question five, respondents identified the sources of funding for the materials budget in their library. The data show that academic libraries overwhelmingly depend on university entitlements for funding of materials budgets and that, as a group, libraries generate

### TABLE 3
Sources of Materials Budget Funding

<table>
<thead>
<tr>
<th>Sources of Funding</th>
<th>Larger Public</th>
<th>Larger Private</th>
<th>Smaller Public</th>
<th>Smaller Private</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational &amp; General (E&amp;G)</td>
<td>88.1%</td>
<td>81.4%</td>
<td>90.2%</td>
<td>85.0%</td>
<td>87.7%</td>
</tr>
<tr>
<td>One-time funding</td>
<td>2.8%</td>
<td>3.8%</td>
<td>4.7%</td>
<td>0.3%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Overhead funds</td>
<td>5.1%</td>
<td>0.1%</td>
<td>2.2%</td>
<td>5.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Grants/endowments</td>
<td>3.3%</td>
<td>14.2%</td>
<td>2.2%</td>
<td>9.3%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Cost recoveries/other</td>
<td>0.5%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Total*</td>
<td>99.8%</td>
<td>100.1%</td>
<td>99.9%</td>
<td>99.9%</td>
<td>100.1%</td>
</tr>
<tr>
<td>Number in set (N)</td>
<td>N=57</td>
<td>N=21</td>
<td>N=56</td>
<td>N=38</td>
<td>N=174+</td>
</tr>
</tbody>
</table>

*Percentages do not always add to 100 due to rounding.

*Several institutions did not identify size and type. Figure in this column is total number of institutions that answered the question.
very few independent funds. Recurring educational funds provide 87.7 percent of materials budget funds for the group as a whole. Grants and endowments provide the next largest source of funds at 5.5 percent, followed by overhead funds, one-time allocations, and cost recoveries, in that order.

Table 3 shows the data from question five broken down by institutional size and affiliation. Larger private libraries are the most successful in generating gift and endowment funds, deriving an average of 14.2 percent of materials budget funding from gifts and endowments. Smaller private institutions derive 9.3 percent of materials funding from gifts and endowments. Comparable figures for larger public and smaller public libraries are 3.3 and 2.2 percent, respectively.

In question six, respondents indicated what sources, aside from the materials budget, customarily fund materials support resources. The data show that virtually all libraries rely on operating funds to pay for materials support resources. Three-fourths of respondents (73.8%) use equipment or capital allocations. One-fifth (20.8%) of the survey population co-sponsors costs of materials support resources with campus computing centers. Sixteen respondents wrote that gifts and endowments support the cost of materials support resources.

Table 4 shows the same data broken down by size and affiliation. Larger publicly supported libraries are more likely than the population as a whole to use cost recoveries to fund materials support resources. This may partially be explained if the larger libraries are more likely to generate cost recoveries for any purpose. Over one-third of larger private libraries are cost-sharing materials support resources with campus computing centers, almost twice the rate of other institutions. This is noteworthy in light of the earlier finding that larger private libraries spend less of their materials budget on nondata and are the least likely of the four library types to change the percentage of the materials budget dedicated to nondata resources. Approximately one-fifth of larger public libraries use overhead funds to pay for materials support resources, versus only three percent of smaller private libraries.

![Table 4: Sources of Funding for Materials Support Other Than Materials Budgets](image)

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...in the past three years, approximately one-third of surveyed institutions increased that portion of the materials budget dedicated to materials support.
institutions. In summary, the larger libraries generally enjoy a wider variety of funding sources than the smaller libraries.

Question seven measured the amount of influence various external units exercise over how the materials budget is allocated. The data yielded no surprises, with library faculty ranked as the most influential group. Several respondents interpreted this question as asking how much influence external entities exert in establishing the monetary size of the materials budget. Variations in interpretation limit the usefulness of data from this question.

**Opinion Questions**

Questions nine through seventeen consisted of a series of statements of opinion. Respondents agreed or disagreed using a standard Likert scale. These questions gave respondents an opportunity to voice personal opinions on a wide variety of questions related to allocations of budgets in libraries. Answers provide an interesting contrast to practice.

Question nine generated strong agreement, with 83.4 percent of respondents agreeing or strongly agreeing that the practice of funding nonmaterials resources from the materials budget is a continuation of a long-standing trend. Question ten also registered strong agreement. When asked if it is natural that the materials budget absorb certain technology costs, seven out of ten respondents agreed or agreed strongly. Less than seventeen percent disagreed with question ten. Question eleven generated the greatest scattering of responses. Slightly less than 40 percent of respondents agreed or strongly agreed that their institution funds nonmaterials resources from the materials budget because they cannot find alternative funding sources. This is precisely the pragmatic rationale that Whaley suspected influenced many librarians in the late 1980s to begin charging online search costs to the materials budget. However, this question registered as much disagreement as agreement, with 41.3 percent disagreeing or strongly disagreeing. Interestingly, respondents from larger libraries were more likely to agree with this statement than those from smaller libraries. Forty-three percent of respondents from libraries with materials budgets exceeding $3 million agreed or strongly agreed with question eleven, whereas 35.2 percent of respondents from smaller libraries agreed.

Questions twelve through fifteen measured views on broader budget issues. These questions measured the extent to which librarians are able or unable to distinguish between departmental units and the impact this may have on budgeting practices. The findings are mixed, with 77.9 percent of respondents agreeing that the separation between intralibrary departments is becoming less clear. However, only a slight majority (56.5%) agree that departmental budgets are becoming less meaningful.

Questions sixteen and seventeen complement questions nine through eleven. In question sixteen, only 23.1 percent agree that academic library materials budgets should be limited to materials in a traditional sense, with 67 percent disagreeing. In question seventeen, 44.2 percent agree that using the materials budget for ever-increasing nonmaterials purchases will create a dependency that will undermine the materials budget and weaken the collection. Forty-five percent disagree with this statement.

**Observations and Comparisons with Earlier Studies**

The data reveal a mixed set of observations. As a whole, libraries are dedicating relatively small amounts of materials budgets to "materials support." Conversely, in the past three years, approximately one-third of surveyed institutions increased that portion of the materials budget dedicated to materials support. Comparisons between large and small institutions also are mixed. Of the four li-
Library types identified in the study, smaller private institutions are the most likely to be changing the mix of the materials budget. However, regression analysis reveals no statistical correlation between library size and the degree to which libraries fund materials support from the materials budget.

In their responses to opinion questions, librarians show similarly ambivalent attitudes to those held by earlier authors in the 1980s when asked about funding online search costs. In question ten, 70.3 percent of respondents agree that as the "container type" evolves, it is natural for certain technology costs to be absorbed by the materials budget. In question eleven, just under 40 percent of respondents state they fund nonmaterials resources through the materials budget because they are having difficulties finding the funding elsewhere. The difference between today's discussions and those of the 1980s is largely one of scale. A decade ago, librarians spoke out on how to most appropriately fund online search costs totaling several or tens of thousands of dollars annually. In today's environment, librarians are struggling to fund support costs in the hundreds of thousands of annual dollars for medium-size libraries, and millions of annual dollars for research institutions. Libraries have reached a point where the issue of which internal source to use to fund materials support is becoming moot. They will be unable to pay for these spiraling costs from any internal source without a major infusion of funding or major budget reengineering. As Campbell points out, libraries have reached a point where they can no longer afford the full cost of automation and still maintain the status quo environment.12

Interestingly, librarians have contributed to this dilemma. As Atkinson (among numerous others) points out, some of the very successes libraries have had in the past twenty years in preserving the purchasing power of acquisitions budgets have quite possibly reduced funding for other, equally important areas of the library.13 If this is true, it is no wonder that some libraries are using materials budgets to fund purchases that are, in the opinion of some observers, more appropriately funded from other budgets. Furthermore, campus administrators may have developed the mistaken notion that the institution is adequately meeting the library's needs simply by maintaining acquisitions budgets.

**Scenarios for the Future**

Libraries, which face serious funding dilemmas and which do not have external funding available, may want to consider alternate scenarios. In the first scenario, the library radically reallocates internal resources, as advocated by Campbell.14 This is painful and may best be accomplished over time. In the second scenario, the library works collaboratively with campus computing units to cosponsor the costs of materials support. Both these scenarios implicitly recognize that distinctions between traditional library units are getting fuzzier. This is borne out in the answers to question fourteen, in which 77.9 percent of respondents agree that the separation between library departments is becoming more unclear. Other scenarios include enhanced fundraising and development efforts, and partnering with outside private interests.

Librarians need to recognize that they are no longer the exclusive gatekeepers of information access, storage, collection, and dissemination. At the same time, they need to promote, defend, and champion their mission on campus. By opening the doors to jointly sponsored funding of materials support with other campus units, it is hoped that libraries will secure new sources of funding. Finally, by looking closely at internal processes and reengineering, where necessary, librarians may be able to help solve some of their own funding problems and better position themselves for the future.
Suggestions for Further Study and Conclusion

The statistical studies, which are published annually and biannually by ARL and ACRL, may offer additional information to augment this study. For instance, those studies could be used to estimate the amount of library materials budgets being spent on binding and preservation. This figure then could be compared to data from this study to provide a truer gauge of the current impact of nondata resources on materials budgets, exclusive of binding and preservation.

Mail surveys are difficult to design and evaluate, and this survey proved no exception. The primary difficulty stems from a lack of opportunity for surveyor and respondent to interact. An additional challenge arose from trying to gather both statistical data and opinion in one study, while also maintaining a reasonable length.

The survey response of 177 institutions presents a sufficient set of data from which to make some observations. However, as with any survey data, findings are qualified at best. Several respondents complained about a lack of definitions and imprecise language in the survey returns. Selected questions in some responses were unanswered. Fortunately, the number of unanswered questions did not exceed five percent of responses for any one question.

Some of the data subsets were small. Only twenty-one respondents fell into the classification of "larger private institution." Had one or two of these respondents answered questions differently, it would have affected the percentages in this subgroup significantly.

The findings of this study are based on survey data gathered in the fall of 1994. Operating results are based on library financial data from fiscal years 1993–94. Events are happening quickly. Undoubtedly, the fiscal, technological, and political environment in our academic libraries will have changed by the time this study is published. The author hopes that this study will have retained some of its usefulness to the academic community, while also recognizing that the data may have historical value.

Notes

3. Ibid., 232–34; reaction by John H. Whaley Jr.
4. Ibid., 234–37; reaction by Marcia Jean Pankake.
11. Whaley, "Reactions to 'Funding,'" 234.
ARL Academic Science and Technology Libraries: Report of a Survey

Julie M. Hurd

The ARL includes among its United States and Canadian member libraries many of North America's largest research collections in science and technology. These libraries often serve as models or benchmarks for other institutions with respect to collection development and management, and the provision of information services. Science and technology librarians have used survey techniques to gather data on ARL science and technology collections for nearly ten years. This report provides findings from a survey of ARL academic science and technology libraries conducted during 1993 and 1994, and updates three earlier surveys. Seventy-five ARL academic libraries returned questionnaires for a response rate of 69 percent. This article describes survey findings on organizational structures, collections, expenditures, and services. Some comparisons are made to earlier surveys.

The Science and Technology Section (STS) of ACRL represents librarians and specialists in the fields of science and technology. In 1984 the section established an ad hoc task force to collect statistics on stand-alone science and technology libraries. One purpose of the original project was to compile comparative data that science librarians could use in drafting proposals and supporting funding decisions. At that time, there was no organized effort to collect data on science and technology libraries and collections. Association of Research Libraries (ARL) libraries publish descriptive statistics, but these data do not break down the subject areas that are of interest to science librarians. The original task force has been continued by the ACRL STS Committee on Comparison of Science and Technology Libraries (the Comparison Committee). The Comparison Committee is charged with collecting, analyzing, and distributing comparative data on North American academic science and technology libraries. To fulfill its charge, the committee has conducted various surveys of science and technology libraries; the results of several of these have been published in library literature.

Background: Earlier Surveys
The Comparison Committee has conducted surveys for ten years. The earliest efforts focused on collecting data from

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Julie Hurd is a Science Librarian in the University Library at the University of Illinois at Chicago, and chaired the Committee on Comparison of Science and Technology Libraries from 1992 to 1995.
the strongest centralized science collections, whether housed in stand-alone or free-standing facilities or existing as separate divisions in larger libraries. Subsequent surveys added libraries with other variant forms of organization to encompass the diversity of science and technology collections that might be excluded by too narrow definitions.

The Comparison Committee based its first survey instrument on the formulation used for the Annual Statistics of Medical School Libraries in the United States and Canada (compiled by the Houston Academy of Medicine). The committee then revised the formulation to make it suitable for a science and technology library population. Over the years, Comparison Committee surveys have consisted of many of the same questions, with changes, additions, or deletions made to reflect differing focus in the data gathering and new developments in the profession. Almost everyone involved in the effort realized that major science and technology collections exhibit great variety in every feature, and designing a survey instrument that every respondent can complete in its entirety proved difficult. The Comparison Committee was able to assemble a body of data that now spans almost ten years and may be used to track trends and new developments.

The ARL member list provided a starting point for defining each survey population; additionally, strong science and technology libraries that were not ARL members were sometimes included. Each survey conducted by the committee queried many of the same libraries, but it should be recognized that variations in the populations surveyed do exist and this must be taken into account in any longitudinal comparisons that are made using committee data.

Three previous general surveys modeled on the above-mentioned survey of medical libraries have been carried out. These are referred to here as Survey 1, Survey 2, and Survey 3; the survey reported in this article is the fourth in this series. In addition, the Comparison Committee conducted two more specialized surveys, both directed toward describing physical and administrative structures. The Definition Survey defined and described organizational and administrative structures prevalent at the time researchers conducted it. The Historical Survey traced the evolution of physical and administrative structures from the 1940s through the 1980s. Table 1 defines the survey populations and shows response rates for committee surveys.

### Table 1
Comparison Committee Surveys

<table>
<thead>
<tr>
<th>Survey</th>
<th>Survey Population</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (1984–1985)</td>
<td>40 ARL stand-alone libraries</td>
<td>24 (60%)</td>
</tr>
<tr>
<td>2. (1986–1987)</td>
<td>145 libraries (ARL + ACRL members with &gt;1 million volumes)</td>
<td>45 (31%)</td>
</tr>
<tr>
<td>Definition Survey¹</td>
<td>107 ARL libraries</td>
<td>91 (85%)</td>
</tr>
<tr>
<td>Historical Survey²</td>
<td>118 libraries (ARL +)</td>
<td>97 (82%)</td>
</tr>
<tr>
<td>3. (1988–1989)</td>
<td>148 libraries, as in 1986–1987</td>
<td>65 (44%)</td>
</tr>
<tr>
<td>4. (1992–1993)</td>
<td>118 ARL libraries</td>
<td>75 (69%)</td>
</tr>
</tbody>
</table>

¹The Definition Survey examined existing physical and administrative structures in science and technology libraries.
²The Historical Survey traced the evolution of physical and administrative structures in science and technology libraries from the 1940s through the 1980s.

### Methodology
Before undertaking the current survey, the Comparison Committee formed a subcommittee to contact former committee members who worked on the 1988–
The committee eliminated questions for which few institutions collected data from the survey instrument. As there were many new technologies employed in libraries, new questions were written to elicit information on their uses in the provision of science and technology information services. For example, the committee added questions on local networking and use of the Internet. The final questionnaire, including definitions and explanatory material, was thirteen pages long, counting a detachable page requesting salary information that could be optional or returned separately to preserve confidentiality. (The survey instrument is not reproduced here, but a copy is available from the author upon request.)

Committee members each contacted a subset of the population to identify the individual in each library to whom the questionnaire should be directed. Following the late summer/autumn 1993 mailing of the survey, committee members stayed in communication with the respondents to offer encouragement and answer questions. By spring 1994, most libraries that were able to participate had returned the questionnaires and data analysis began. The committee chair made a preliminary report of the survey findings at the STS Forum on Science and Technology Library Research during the ALA annual conference in June 1994. During late summer 1994, committee members made reminder calls to libraries that had indicated their willingness to participate but had not yet returned the survey.

By October 1, 1994, 75 institutions had returned 152 responses for a 69.44 percent return rate. Several institutions had indicated that they would not be able to participate. For those libraries, the committee contact persons made an effort to learn about their organizational structure. In a number of cases, nonresponding libraries totally integrated collections with no separable science and technology statistics.
The author used Microsoft Excel for the Macintosh to enter returned survey data into a spreadsheet. The data were distributed in both disk and paper formats as raw numbers to committee members assisting in data analysis. With this survey, the committee deviated from the past practice of distributing raw data to participants. The survey offered respondents the option of choosing to share their responses, with their institutions identified, or maintaining confidentiality. Enough respondents chose confidentiality to suggest that only aggregate figures should be reported for this survey. Hence, no respondents will be identified by name in any of the committee's reports.

Organizational Structure

The Definition Survey and the Historical Survey carried out by the committee several years ago provided insights into the physical structures found in major science and technology libraries. These two surveys offer a snapshot of the structures found at that time and a retrospective perspective. Although the population varied somewhat from the current survey, earlier surveys included many of the same libraries. A comparison of the list of libraries responding to the Definition Survey with this survey found that seventy-two libraries were in both groups for an overlap of 96 percent. This high degree of overlap with the populations studied earlier should permit tracking of trends in library organization.

The arguments for and against centralization of academic collections are summarized by Leon Shkolnik, who concludes that "Clearly, the trend in academic libraries is toward greater centralization. . . ." Comparison Committee surveys document this centralizing tendency for the physical resources in science and engineering. Holdouts to the trend appeared to be some of the oldest and largest libraries, mostly located in the Northeast. Factors that appear to contribute to this centralizing trend include economic constraints (especially costs for duplicate journal subscriptions), security considerations, space pressures, and the increasing interdisciplinarity of research. Conversely, mitigating factors include advances in automation that support decentralized data input and use, electronic formats, new delivery options, and faculty preferences for small, conveniently located collections. These and other influences are discussed by Shkolnik.

The current survey updates the Historical and Definition surveys and offers details on the variety of physical arrangements found in ARL academic science and technology libraries. Because the committee's explorations into the reasons for nonresponse pointed to a need for more options in describing physical organization of collections, some new categories were created. This survey employed the following definitions of physical organization in analyzing data:

- **stand-alone**: a separate, multidisciplinary science and technology library housed in its own building;
- **main divisional**: a science and technology division, with separate statistics, housed in a main library;
- **multisubject departmental**: a divisional library with more than three discrete subjects in its collection housed with science and technology departments;
- **subject departmental**: collections composed of one or two subjects housed in a department (note: some closely related combinations such as mathematics and statistics were treated as a single subject);
- **decentralized**: a library system with three or more subject departmental libraries and no major multisubject collections;
- **integrated**: a science and technology collection nonseparable from an entire library collection with no separate statistics;
- **hybrid**: various combinations of divisional, departmental, and integrated collections not fitting into the above categories (i.e., "other").

Libraries classed as stand-alone, main divisional, and integrated sometimes re-
Figure 1 displays that continuum of structures.

Using the categories defined above, the author coded returned questionnaires and entered data into a master spreadsheet; information supplied by the respondents permitted a categorization according to type. In cases where returns represented departmental collections, the author also assigned a category for the institution as a whole. Organizational information for nonrespondents was included, if available. A sort by type for seventy-nine institutions is displayed in figure 2. Different shadings distinguish libraries with and without branches. A total of fifty institutions, more than 63 percent of those whose organization is known, reported the presence of centralized science and technology collections, whether in stand-alone, main divisional, or multisubject departmental libraries.

**FIGURE 1**
Organizational Structures: A Continuum

- Decentralized libraries
  - 3+ branches
  - Multi-subject departmental libraries
  - Stand-alone libraries
  - Main-divisional libraries
  - Integrated libraries

- Distributed collections
  - Based near users
  - Centralized models, possibly with 1 or 2 subsidiary branches
  - No discrete sci/tech collection
  - No separable statistics

ARL Academic Science/Technology Libraries

A total of fifty institutions, more than 63 percent of those whose organization is known, reported the presence of centralized science and technology collections, whether in stand-alone, main divisional, or multisubject departmental libraries.
whether in stand-alone, main divisional, or multisubject departmental libraries.

Library size is one characteristic likely to influence physical and organizational structure, as demonstrated in the analysis reported in the Definition Survey. ARL rankings provide an index that measures relative size of university libraries taking into account the number of volumes held, the number added during the previous fiscal year, the number of current serials, total operating expenditures, and the size of professional and nonprofessional staff (excluding student employees). Because this index is both generally respected and widely used, the author selected it as the measure of size for this analysis. The author entered ARL ranks for libraries into the spreadsheets and computed mean ARL rankings for each of the organizational categories and for those libraries not responding to the survey. Table 2 summarizes the data for 103 separate libraries in seventy-nine institutions. Several institutions reported the presence of more than one library in a particular category, whereas others reported the existence of libraries in two or more categories.

The mean ARL rank for nonresponding libraries was 61.4; smaller institutions are underrepresented in this survey. Earlier observations that the largest institutions are more likely to maintain decentralized collections are corroborated by this study. A mean ARL rank of 33.4 characterizes the decentralized science and technology libraries in institutions in more than one category; “all respondents” includes all institutions supplying any data on organizational structure.
TABLE 3
Characteristics of Types

<table>
<thead>
<tr>
<th>Type</th>
<th># of libraries</th>
<th>Size (sq. ft.)</th>
<th>Seats</th>
<th>Volumes</th>
<th>Active Serials</th>
<th>Total Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental*</td>
<td>161</td>
<td>6,571</td>
<td>77</td>
<td>62,692</td>
<td>740</td>
<td>4.78</td>
</tr>
<tr>
<td>Multisubject</td>
<td>12</td>
<td>18,304</td>
<td>251</td>
<td>176,323</td>
<td>1,843</td>
<td>17.51</td>
</tr>
<tr>
<td>Main divisional</td>
<td>13</td>
<td>25,754</td>
<td>250</td>
<td>223,175</td>
<td>2,343</td>
<td>10.32</td>
</tr>
<tr>
<td>Stand-alone</td>
<td>30</td>
<td>68,322</td>
<td>586</td>
<td>372,260</td>
<td>4,040</td>
<td>29.01</td>
</tr>
</tbody>
</table>

* Averages for all subjects; see table 4 for a breakdown by subject of departmental library.

Technology collections as associated with the larger libraries. Conversely, stand-alone libraries are found in institutions with a mean ARL rank of 50.2, much closer to the median rank. This study did not collect data that would provide an explanation for this observation, but it appears likely that more factors than library size alone will be determinants for a stand-alone library. The Historical Survey identified an increase in the number of stand-alone libraries, and a corresponding decline in decentralized collections, over the period studied. Numerous factors might dictate whether a particular institution would choose to build a stand-alone library. For example, the availability of funding for new construction and the relative strength and number of science programs on campus could be possible influences, as might the values and vision of campus decision makers. Additional exploration of such issues is beyond the scope of this survey and is left to future investigators.

Characteristics of the types of units are summarized in table 3. Mean size, seating capacity, collection size, and total staffing (FTEs, including hourly student employees) are shown for each group. De-

FIGURE 3
Disciplines of Departmental Libraries
(179 branches in 51 institutions)
Table 4
Departmental Libraries

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Size (sq. ft.)</th>
<th>Seats</th>
<th>Volumes</th>
<th>Active Serials</th>
<th>Total Users</th>
<th>Total Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>8,286</td>
<td>64</td>
<td>65,283</td>
<td>744</td>
<td>923</td>
<td>4.18</td>
</tr>
<tr>
<td>Chemistry</td>
<td>5,268</td>
<td>72</td>
<td>43,970</td>
<td>296</td>
<td>551</td>
<td>3.66</td>
</tr>
<tr>
<td>Engineering</td>
<td>10,739</td>
<td>130</td>
<td>103,108</td>
<td>1,115</td>
<td>2,803</td>
<td>6.81</td>
</tr>
<tr>
<td>Geology</td>
<td>6,033</td>
<td>67</td>
<td>71,605</td>
<td>1,046</td>
<td>375</td>
<td>5.31</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4,543</td>
<td>62</td>
<td>49,353</td>
<td>624</td>
<td>670</td>
<td>4.33</td>
</tr>
<tr>
<td>Physics</td>
<td>5,342</td>
<td>75</td>
<td>58,181</td>
<td>502</td>
<td>563</td>
<td>4.43</td>
</tr>
</tbody>
</table>

Departmental libraries are the smallest, as expected, and stand-alone libraries are the largest.

Departmental Libraries
Overall, fifty-one institutions reported the presence of one or more departmental libraries, and many questionnaires provided considerable detail on the nature of those 179 branch collections. The author sorted data for branches by subject. The disciplines most frequently served by departmental libraries are displayed in figure 3.

Shading on the bar graph differentiates single- and shared-discipline collections. Each subject includes any shared-discipline collections, so the total represented by summing all bars is greater than the number of branch libraries reporting. This was done to provide a picture of the relative prevalence of branch libraries in the various science disciplines. For example, mathematics departments are most likely to be served by a departmental library, whereas engineering units are least likely to share their libraries with other disciplines. Respondents reported numerous combinations, and some of these certainly reflect rational pairings (such as physics and mathematics) whereas others may merely result because two departments share a building.

The most frequently named disciplines of departmental libraries are, in rank order, mathematics, engineering and chemistry, physics, biology, and geology. The Definition Survey-ranked list is quite similar: mathematics, chemistry, engineering, physics, geology, and biology. Survey data are not likely to be capable of explaining this order, but some speculation is possible based on the nature of the disciplines' literatures and the information-seeking habits of the various scientists. Traditions within a discipline may be another possible influence. Shkolnik, and many of the authors whom he cites, identify and analyze influential factors that contribute to the presence of departmental libraries.

Table 4 shows the characteristics of the most frequently encountered discipline departmental libraries. Engineering libraries appear to be the largest, but geology collections have nearly as many active serial subscriptions, although they serve far fewer total users. ("Total users" include faculty, graduate and undergraduate students, and other affiliated academic and professional personnel.)

Table 5
Comparisons: Decentralized versus Stand-Alone Libraries

<table>
<thead>
<tr>
<th>Library Type (#)</th>
<th>Total Materials</th>
<th>Total Users</th>
<th>Cost/User</th>
<th>Total Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralized (6)</td>
<td>$1,731,631</td>
<td>6,372</td>
<td>$271.76</td>
<td>32.11</td>
</tr>
<tr>
<td>Stand-alone (21)</td>
<td>$1,531,580</td>
<td>6,326</td>
<td>$242.11</td>
<td>29.01</td>
</tr>
</tbody>
</table>
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professional staff for whom a departmental collection is their primary library.) Some of the variations observed may be explained by the relative sizes of the subject literatures, particularly the journal literatures. Other differences may reflect academic program strengths and sizes, as well as availability of funding on a particular campus.

### Financial Support: Materials Expenditures

Survey respondents supplied information on materials expenditures for the library unit they were describing. This information was then broken down into categories for monographs, serials, and electronic resources. For some organizational types, few data were reported. For example, integrated collections, by definition, were not able to report expenditures for science materials. Data were available, and means are reported in Table 5, for stand-alone and decentralized libraries. Data for subject departmental libraries are displayed in Table 6.8 Values supplied by Canadian libraries were converted to U.S. dollars at the then-prevailing exchange rate of $1 US = $0.74 Canadian. Not all libraries participating in the survey collected all the requested data, but enough did respond that differences are evident.

The survey requested information on expenditures for electronic resources, but, in fact, only a small percentage of libraries had such separate data for the survey period. Commentary provided by several survey respondents indicated that some institutions were moving toward allocating a separate line in the materials budget, whereas others reported funding electronic resources from different budget lines or through special allocations and grants. Funding and accounting for electronic resources appears to be an area where change is in process. Subsequent surveys may be able to document this development.

Table 5 provides comparative data on decentralized versus stand-alone collections. These data should be interpreted cautiously because very few decentralized systems were able to provide details on aggregate expenditures for all their departmental libraries. Some of the very largest decentralized systems with numerous branch libraries did not report. Consequently, the averages shown may be lower than would be the case if they had included all libraries. (Many more libraries provided data for individual departmental collections, as summarized in Table 6.)

Despite the limitations noted above, the data support the conclusion that decentralized collections are more costly to maintain than stand-alone libraries. Institutions with decentralized collections...
spent, on average, $1,584,970 on serials; stand-alone libraries reported spending $1,247,031. Duplication of journal subscriptions is a feature of decentralized collections, but the larger expenditures also may be related, in part, to library size overall as measured by ARL rankings. Conversely, stand-alone libraries reported higher monographic budgets than the participating decentralized libraries. Data here are insufficient to justify any more than speculation in explaining this phenomenon. For example, the presence of a stand-alone science library may indicate the high visibility and overall relative importance of science programs on a particular campus, which would be manifested in a high level of commitment to develop the science monographic collection. In addition, fewer duplicate serial titles could easily be reflected in larger monographic budgets. The cost/user figure displayed in table 5 is based only on reported materials expenditures (monographs, serials, and electronic); staffing costs are not included. Total staffing for each type of system also is reported and would represent an additional cost factor to be considered in comparisons of the two organizational types.

Table 6 summarizes the data reported for subject departmental libraries and confirms the well-known fact that scientific journals comprise a major portion of the materials budget in each of these disciplines. The data are displayed as a bar graph in figure 4. The cost/user data for departmental libraries are based only on materials costs, as in table 5.

For the disciplines represented in figure 4 and table 6, the percentage of the materials budget spent on serials ranges from a low of 0.80 for engineering to a high of 0.92 for chemistry. Librarians who develop and manage science collections probably will not be surprised by these figures. In fact, the figures correlate closely with use patterns for types of materials as summarized by Robin Devin in a paper first presented at the 1988 Charleston Conference. Devin identified more than fifty studies on the characteristics of literature use in various disciplines and summarized data from many

![FIGURE 4](image-url)
citation studies to compile a table of the percentage of citations to serials in subject literatures. The percentage of materials budgets spent on serials in ARL departmental libraries correlates positively with the relative importance of serials as measured by citations in published literature (correlation coefficient = 0.82). The percentage of the budget spent on serials also can be expected to reflect serial costs in a field. To test this hypothesis, the author consulted Library Journal's 1993 periodical price index to obtain an average cost per title for each science discipline. There is a very strong positive correlation of 0.94 between the percentage of the budget spent on serials and the average cost for serials in that discipline.

The cost per user computed for each discipline ranges from a low of $141 for engineering to a high of $633 for physics. The cost per user can be explained by a combination of factors including typical serials costs in a discipline, the number of serials needed to support research in that discipline, and the size of the primary user population. Engineering libraries frequenty serve large undergraduate programs as well as sizable graduate programs, contributing to a lower cost per user than in disciplines such as geology where the enrollments are typically much lower. In both chemistry and physics, total user populations are comparable and of moderate size, and journal costs are among the highest of all disciplines in an academic library. Physics and chemistry collections have the highest cost per user, although a mitigating circumstance, especially in chemistry, may be the many uncounted users for whom the library serves as an important secondary collection. For example, the increasing importance of interdisciplinary research results in departmental collections being used by researchers in other fields than the primary subject. A chemistry library also may be important to scientists working in materials science, pharmacy, medicine, and many other disciplines. These secondary users are more difficult to identify and count, but they certainly benefit from collections that were developed originally to serve a particular discipline.

Survey respondents reported serial cancellations and additions. Forty-two percent of the respondents (32 libraries) reported canceling serials during the period covered by the survey for a total of 5,525 cancellations. The average number of cancellations per library was 172, ranging from a high of 500 to a low of four among institutions canceling. Forty-one percent of the respondents (31 libraries) reported adding subscriptions for a total of 1,788 new subscriptions entered. The average number of additions among those institutions reporting was 57, ranging from a high of 612 new titles at one institution to a low of only one. Many institutions adding new subscriptions (14 out of 31) added fewer than twenty-five titles. Only twenty institutions were able to add titles without cutting. The net loss

<table>
<thead>
<tr>
<th>Rank</th>
<th>Product</th>
<th>Number Held</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MathSci</td>
<td>44</td>
</tr>
<tr>
<td>2</td>
<td>Compendex/Engineering Index</td>
<td>37</td>
</tr>
<tr>
<td>3/4</td>
<td>Biological Abstracts/BIOSIS</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>GeoRef</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>Science Citation Index</td>
<td>34</td>
</tr>
<tr>
<td>6</td>
<td>MEDLINE</td>
<td>33</td>
</tr>
<tr>
<td>7</td>
<td>INSPEC</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>AGRICOLA</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>Applied Science &amp; Technology Index</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>Computer Select</td>
<td>21</td>
</tr>
</tbody>
</table>
of subscriptions in this population was 3,737 titles for the reporting period. Assigning a dollar value to this very diverse set of titles would be difficult to do precisely with available data, but the 1993 periodical price index does allow a range to be estimated. The price index includes cost information by broad subject categories. For Science Citation Index titles, the average cost per title during 1993 was $345.99 for domestic publications and $658.78 for foreign publications. It is unlikely that all canceled subscriptions were exclusively either category, but using these values as extremes allows estimation of an upper bound of $2,461,860 and a lower bound of $1,292,964 in losses to publishers of scientific and technical journals through ARL cancellations alone!

**Electronic Resources**

This survey represents the first effort to collect detailed information on electronic resources. Survey 3 had only requested a figure on CD-ROM expenditures and identification of any locally mounted databases. In the period that elapsed since Survey 3, dramatic changes took place, with a proliferation of CD-ROM products. Some institutions reported extensive tape loading of purchased or leased databases. New sections were written for the questionnaire to elicit details on some of these types of activities. The survey included questions about database availability, whether as CD-ROM-based products on stand-alone or networked workstations or as tape-loaded databases on an institutional mainframe. Table 7 lists the most frequently held CD-ROM reference products, whether used over a network or on a stand-alone workstation. Table 8 shows the databases most frequently reported as locally mounted on an institutional computer. Table 9 combines the databases that are available in respondents' libraries, whether as CD-ROMs or locally mounted files.

MEDLINE leads the list by a considerable amount and was available in seventy libraries. Comparing the tables reveals details such as the fact that MathSci appears more frequently as a CD-ROM product than a local database, possibly reflecting its targeted appeal to a well-defined audience, primarily mathematicians. Other discipline-based CD-ROM products include Compendex, GeoRef, and BIOSIS. Although not analyzed for

<table>
<thead>
<tr>
<th>Rank</th>
<th>Database</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MEDLINE</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>PsycInfo/PsycLit</td>
<td>53</td>
</tr>
<tr>
<td>3</td>
<td>MathSci</td>
<td>47</td>
</tr>
<tr>
<td>4/5</td>
<td>INSPEC</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Biological Abstracts/BIOSIS</td>
<td>45</td>
</tr>
<tr>
<td>6/7</td>
<td>ERIC</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Compendex/Engineering Index</td>
<td>44</td>
</tr>
<tr>
<td>8</td>
<td>GeoRef</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>Applied Science &amp; Technology Index</td>
<td>36</td>
</tr>
<tr>
<td>10</td>
<td>Science Citation Index</td>
<td>34</td>
</tr>
</tbody>
</table>
this article, survey data exist that can be used to test whether specialized CD-ROM products are more likely to be found in subject departmental libraries than in multidisciplinary collections.

A number of the mainframe databases are multidisciplinary in nature, such as Current Contents, newspaper indexes, and encyclopedias. Others are likely to be of interdisciplinary interest (Psyclnfo, ERIC) or used by larger groups scattered across a campus (MEDLINE). Of course, the availability of a database as a CD-ROM or a tape-loadable product also is a determining factor, as is the relative cost of the two formats.

The survey included a question about provision of access to the Internet, an area where activity seemed to be increasing dramatically as this questionnaire was written. By the time the surveys were returned, the change appeared complete: virtually all respondents stated that their libraries offer access to the Internet.

Salaries
The questionnaire also requested salary information on a separable page. Some respondents chose to include that with the rest of the questionnaire; others returned the salary page under separate cover or not at all.\(^1\) The salaries shown in table 10 represent data submitted by sixty-three institutions. Eleven libraries reported in Canadian dollars; these were converted to U.S. dollars at the rate of exchange used by the ARL in compiling their annual salary survey for the comparable time period.\(^1\) Not all respondents provided salaries in each category requested; thus, the number of libraries reporting in each rank is indicated in the table.

The total library budgets for the respondents range from just under $4 million to more than $35 million, with an average of about $12.5 million. ARL statistics report salaries to be, on average, 51 percent of a total library budget; that also is the percentage reported by these respondents.

Science librarians often speculate about whether salaries are better for science specialists than for those in other subject areas. ARL salary statistics tabulate salary data for law and medical librarians separately, but provide no details on science/engineering librarians or any other specialists broken down by subject area. ARL data for 1993 report an average salary for a “branch head” as $46,838, and this might be compared to salary data reported here for “head” of a science library as $47,694. The difference suggests some support for the hypothesis that science subject specialists earn higher salaries, but would need to be tested more systematically with data gathered in a fashion that allows direct comparisons across identically defined categories.

Directions for Further Research
The author did not analyze all the data collected for Survey 4 in this article. Additional analyses may result in further publication, and at least one project is under way describing staffing patterns in science and technology libraries. Marilyn Von Seggern of Washington State University and Donna Cromer of the University of New Mexico are analyzing this portion.
of the data and are preparing a separate article that will be submitted for publication upon completion. For that reason, this analysis reports only very general staffing data.

The Comparison Committee, under its present charge, is directed to collect statistical data of this type on an ongoing basis. Future surveys that include similar questions to those that were used here should continue to build a longitudinal collection of statistics supporting identification of trends and documenting significant changes. Given the many developments in research libraries, it is likely that Survey 5 will add new questions, especially in areas that relate to electronic resources and applications of information technology. For example, electronic journals are increasing in number and mode of distribution, especially in science libraries. Documenting their use and impact on library operations might be an additional area of exploration for the next survey.

As libraries were contacted for this survey, there was anecdotal evidence that some were reorganizing and flattening administrative hierarchies or trying new management techniques such as total quality management (TQM) or reengineering. Exploring how science libraries are participating in these developments might provide a focus for a future investigation. In addition, there will no doubt be other areas, as yet unknown, that will result in the collection of new statistics descriptive of the diversity found in science and technology libraries.

Note: The author benefited from significant input from committee members who assisted with data analysis: Andrea Duda, University of California-Santa Barbara; Bonnie Osif, Pennsylvania State University; Nancy Simons, University of Arizona; and Terry Wittig, Carnegie Mellon University. All the committee members contacted a portion of the survey population, answered questions from respondents, and provided follow-up to ensure maximum return of questionnaires. This is a joint project by a true "working" committee. The Comparison Committee expresses appreciation to all those ARL librarians who took time from busy schedules to provide data and thoughtful responses to this survey. Without their input, librarians would know much less about science and technology libraries in ARL.

Notes


5. ARL Statistics, 1992-1993 (Washington, D.C.: ARL, 1994). (ARL ranks for the period corresponding most closely to the survey data were utilized.) See also URL = http://www.lib.virginia.edu/arlstats/ where data are available graphically and as files for ftp.

6. Bonnie Osif, Pennsylvania State University, carried out the analysis of expenditures for collections.
11. Andrea Duda, University of California-Santa Barbara, compiled data on CD-ROM and mainframe tape-loaded databases.
12. Nancy Simons, University of Arizona, analyzed the salary data.
Student Use of Online Catalogs and Other Information Channels

Ingrid Hsieh-Yee

Many information channels are available to students, but it is not clear how students select and use them. A survey of juniors at two universities found online catalogs to be the most commonly used information channel. Students identified "convenience" and "quality of data" as the top two factors in their choice of information channel. Not many students accessed the online catalog remotely. Most conducted keyword and subject searches, but few seemed to understand the differences between them. Students searched the online catalog file and the databases containing the most recent literature more frequently than other databases, and had positive views about searching the system. Analyses of selected characteristics of students showed that race, school, and economic background contributed to their information-seeking behavior. The study affirms the value of librarians and of formal information channels, suggests ways to augment the online catalog, and reminds librarians that equal access to information technology does not necessarily lead to equal use.

Academic and research libraries have assimilated information technology into their services to support study and teaching. Besides print tools, students now have online catalogs, electronic databases, CD-ROM databases, and network technology to help them search for information. But it is unclear how students who are under time constraints and academic pressure make use of the information channels available to them. Do they prefer one over the others? What do they take into account in selecting a channel? How do they use the online catalog, which has the most investment from the libraries? And what factors contribute to their use of information channels? Answers to these questions will enable librarians to plan for cost-effective services and will suggest new features to make the online catalog more user-friendly. This study attempts to address these questions.

Literature Review

Information-Seeking Behavior of College Students

Researchers have analyzed the information-seeking behavior of undergraduate students from various perspectives, have examined the problems of library use, and have categorized library anxiety, while exploring the mental states of students in using library resources. Students' use of one or more information sources is often the focus of investigation, as is their use

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of library collections, which has received more attention from researchers than other topics. Several studies confirm that college students make little use of library collections. Researchers also have investigated possible causes of students' choice of information channels, but the results are less conclusive. Kathleen Dunn reported that undergraduates made considerable use of informal, interpersonal sources such as family members and friends, but ranked teachers first and the library second in terms of their importance in providing information. She also found that students interested in intellectual stimulation and professional success tended to use libraries and experts for needed information. Tony Mays reported a lack of a clear correlation between academic achievement and use of library collections in Australia, and concluded that undergraduates tend to regard libraries as study halls and consider them superfluous to their educational program. Nigel Ford, however, found that some students regarded libraries as an extension of what they learn from lectures. Mays also reported that no prediction can be made between discipline and library use. However, Stephen A. Osiobe found that discipline related to Nigerian undergraduates' use of information channels, though the relationship was very weak. As for students' use of information sources, Osiobe found browsing to be most popular, with faculty and the card catalog tying for second, followed by librarians, references in articles and books, abstracts and indexes, and colleagues. Focusing on students' progress through the research process, Barbara Fister reported that they used online catalogs, indexes, and reference tools to browse the field and considered citation network the most direct and efficient way to find relevant information.

College Students and Online Catalogs

Because academic libraries were among the first libraries to make online catalogs available, much of the literature on online catalogs examines undergraduates' use of online catalogs. College students are reportedly enthusiastic about online catalogs and prefer them to card catalogs. They conduct more subject searches on online catalogs but experience difficulties with these searches. Nor do they have a clear understanding of the contents of an online catalog. The availability of keyword access has made it the preferred searching method. For instance, Pat Ensor found that most users (73%) at Indiana State University use keyword searching. She also reported that many users (50%), like those interviewed by Karen Markey, misunderstand the nature of subject searches and do not know that they need to use the Library of Congress Subject Headings (LCSH) for subject searching.

Catalog Improvement and Expansion

Researchers have explored various methods to enhance or improve subject searches. Markey and Anh N. Demeyer, for instance, studied the use of the Dewey Decimal classification scheme for retrieval. Jeffrey C. Heustis analyzed LC classification numbers for browsing and Marcia J. Bates suggested incorporating a "superthesaurus" into online catalogs. Mary Micco developed a prototype catalog based on subject clusters while Diane Vizine-Goetz and Karen Markey Drabenstott examined whether matching subject terms with LCSH was the best way to retrieve items relevant to the user's topic. Ray R. Larson experimented with classification clustering in CHESHIRE. In the meantime, several online catalogs expanded to provide users with access to collections of other libraries and commercially produced databases. However, it is unclear whether the use of such augmented catalogs is the same as that of the earlier online catalogs.

Research Questions

The present study investigated the infor-
information-seeking behavior of students at the American University (AU) and the University of the District of Columbia (UDC) because their student bodies offer an opportunity to examine the relationships between information-seeking behavior and factors such as race and economic background. Specifically, the research questions were:

- What are the information channels used by college students when they work on course-related projects? What factors do students consider in selecting information channels?
- How do college students use ALADIN, an augmented catalog that provides access to the holdings of the Washington Research Library Consortium and several commercial databases?
- How are selected characteristics of students related to their use of information channels, ALADIN and libraries?

Methodology

Population and Sample

The study's population included juniors at AU and UDC because these students could be assumed to have had some experience in looking for information after completing two years of college education. By estimating that 75 percent of the subjects will display different information-seeking behaviors and setting the confidence level in the findings at 95 percent, the author, using a statistical program (StatPac Gold), found the desirable sample size to be 256. A random sample of 11 percent of the population was then taken, resulting in a sample of 258 juniors.

Survey Instrument

Because information on college students' information channels is sketchy, the librarians who assisted with the project held two focus group interviews to identify all the channels students explored when they worked on an assignment. Students described how they selected an information channel, used ALADIN and libraries, and offered suggestions for improving library services. The author developed a questionnaire from these findings, pretested it on twenty-four students in the study population, solicited comments from the librarians, and revised it for the main study. (The survey instrument is available from the author upon request.)

Data Collection

The original plan involved collecting data through a mail survey. The author guaranteed subjects anonymity and provided a self-addressed, stamped return envelope for their responses. Because of a delay in reviewing the study at one university, the first main test did not take place until mid-April of 1994. By then, final examinations were approaching and students did not respond well to the survey. The author then obtained an extension of the deadline from the funding agency so that the research team could collect better data. During the summer, the author revised the survey instrument again and the team decided to collect survey responses on campus in addition to the mail survey. The librarians agreed to post signs around their libraries to encourage participation or to seek faculty assistance in collecting data.

Researchers mailed 258 surveys in September of 1994 and mailed another set of surveys in October to increase the response rate.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Survey Response Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UDC</td>
</tr>
<tr>
<td>Sent</td>
<td>137</td>
</tr>
<tr>
<td>Received</td>
<td>83</td>
</tr>
<tr>
<td>Response rate</td>
<td>61%</td>
</tr>
<tr>
<td>Undelivered mail</td>
<td>34</td>
</tr>
<tr>
<td>Usable responses</td>
<td>49</td>
</tr>
<tr>
<td>Response rate</td>
<td>48%</td>
</tr>
</tbody>
</table>

(Undelivered ones removed)
TABLE 2
Use of Information Channels

<table>
<thead>
<tr>
<th>Channel</th>
<th>Percentage of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online catalogs</td>
<td>88</td>
</tr>
<tr>
<td>Roommates/classmates/friends</td>
<td>71</td>
</tr>
<tr>
<td>References (books or articles)</td>
<td>70</td>
</tr>
<tr>
<td>Librarians</td>
<td>70</td>
</tr>
<tr>
<td>Printed indexes</td>
<td>63</td>
</tr>
<tr>
<td>Stack browsing</td>
<td>61</td>
</tr>
<tr>
<td>Reserved readings</td>
<td>61</td>
</tr>
<tr>
<td>Teachers</td>
<td>57</td>
</tr>
<tr>
<td>Agencies</td>
<td>50</td>
</tr>
<tr>
<td>Students who took the course</td>
<td>46</td>
</tr>
<tr>
<td>Special bibliography</td>
<td>46</td>
</tr>
<tr>
<td>Parents</td>
<td>42</td>
</tr>
<tr>
<td>CD-ROM databases</td>
<td>28</td>
</tr>
<tr>
<td>Online databases</td>
<td>19</td>
</tr>
</tbody>
</table>

*Respondents reported all the information channels they have used, so the total for each channel is potentially 100%.

response rate. By mid-November, researchers received a total of 157 responses, resulting in a response rate of 61 percent. After excluding incomplete and undelivered surveys, the response rate went down to 53 percent, with a total of 114 usable survey (see table 1).

Data collection on campus met with varying success. AU contributed forty-four completed surveys, and UDC twenty-five surveys. To determine whether campus respondents and mail respondents displayed different behaviors, the author performed Chi-square tests on forty-four selected dependent variables. Test results show that the two groups differed in only two variables, so the researchers concluded that no separate analyses were necessary. The final analysis included seventy-four surveys from UDC and 109 surveys from AU.

Data Analysis
A research assistant coded data and entered them into StatPac Gold, and the author compiled descriptive statistics and performed Chi-square tests to analyze the associations between variables.

Findings
Profiles of Respondents
Forty percent of the respondents were enrolled in UDC, and the rest in AU. Nearly 60 percent were female, and 39 percent male. Whites represented 51 percent of the respondents, African Americans 29 percent, and Asians and Hispanics ten percent. The other ten percent did not specify their race. As for economic background, slightly more than 52 percent of the respondents came from families with an annual income of more than $35,000, and 65 percent of the respondents had a part-time job. Very few of the respondents (18%) had children.

Findings on Information Sources
Information channels. Students identified fourteen information channels during the focus group interviews. Most survey respondents (88%) said they used online catalogs, and at least 63 percent reported consulting roommates and friends, book and article references, librarians, and printed indexes. It is somewhat surprising that only 19 percent of the students used online databases and 28 percent used CD-ROMs. Such low use, furthermore, was not because of students'
Factors Affecting Information Channel Selection

<table>
<thead>
<tr>
<th>Factor</th>
<th>Score</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience</td>
<td>3.43</td>
<td>1</td>
</tr>
<tr>
<td>Quality of data</td>
<td>4.02</td>
<td>2</td>
</tr>
<tr>
<td>Ease of use</td>
<td>4.66</td>
<td>3</td>
</tr>
<tr>
<td>Availability</td>
<td>4.80</td>
<td>4</td>
</tr>
<tr>
<td>Experience</td>
<td>5.70</td>
<td>5</td>
</tr>
<tr>
<td>Cost</td>
<td>7.08</td>
<td>6</td>
</tr>
</tbody>
</table>

*The score is the mean of values assigned to each factor. The lower the score, the more important the factor is to respondents.

TABLE 4

lack of knowledge—more than half of the respondents had knowledge of CD-ROM databases, 43 percent had searched them, and 44 percent knew about online databases. In spite of the rapid growth of online databases and CD-ROM titles, few students used them for needed information. Table 2 presents students' use of information channels.

As table 3 shows, among the 14 channels, students showed a clear preference for online catalogs. More than half of the respondents listed them as the most frequently used method, and 16 percent reported them the second most frequently used method. Students also consulted print indexes, teachers or citation references, but much less frequently than online catalogs.

Factors in channel selection. Of the six factors that may have affected their selection of information channels, students identified “convenience” and “quality of data” as the top two. “Ease of use” ranked third, followed by “availability,” “experience,” and “cost” (see table 4).

Experience with ALADIN

Learning ALADIN. Students learned to use ALADIN through various methods. Most learned via “on-screen instructions” (60%), and many consulted “library staff” (44%). Other, less popular methods included “by myself without any help” (38%), “reading the printed instructions” (20%), and “from a friend” (18%). Data suggest that the use of ALADIN was a fairly solitary activity. Typically, a student learned to use it by reading instructions on the screen; seeking the help of library staff, if necessary; or exploring the system by him- or herself. Students were less likely to read the printed instructions or seek help from a friend. The strong reliance on on-screen instructions underscores the importance of system interface, screen displays, and message design. As the system evolves, improvement in these areas will encourage its use.

Remote access. Considering the widespread use of personal computers, it is somewhat surprising that only 26 percent of the respondents accessed ALADIN from outside the library. But this finding is consistent with earlier reports that most undergraduates were in-library users and that faculty, graduate students, and other academic staff tended to be remote users. The reason for the small number of remote student users could be that most students did their research in libraries. Or, it could be that students could not afford a modem or might not know how to use one. As the Internet becomes more popular among students, it will be interesting to monitor whether remote access to ALADIN increases.

Useful bibliographic elements. Students reported three elements that they usually looked for on an ALADIN display. They presented a variety of patterns, with “author-title-subject” being the most
TABLE 5  
Sources of Keywords and Subject Headings

<table>
<thead>
<tr>
<th>Source of keywords</th>
<th>Percentagea</th>
</tr>
</thead>
<tbody>
<tr>
<td>What I can think of at the time</td>
<td>78</td>
</tr>
<tr>
<td>Earlier readings</td>
<td>57</td>
</tr>
<tr>
<td>Records I have retrieved</td>
<td>49</td>
</tr>
<tr>
<td>Librarian’s help</td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of subject headings</th>
<th>Percentagea</th>
</tr>
</thead>
<tbody>
<tr>
<td>What I can think of at the time</td>
<td>66</td>
</tr>
<tr>
<td>Records I have retrieved</td>
<td>57</td>
</tr>
<tr>
<td>Earlier readings</td>
<td>54</td>
</tr>
<tr>
<td>Librarian’s help</td>
<td>21</td>
</tr>
<tr>
<td>LCSH</td>
<td>15</td>
</tr>
</tbody>
</table>

*aMultiple sources could be reported, so each source is potentially 100%.

common combination (reported by 20%), followed by “subject-call number-status of the book” (9%). Data show that “subject headings” were the most consulted elements, followed by titles, authors, status of the book(s), and call numbers. Students could be using the subject headings to determine the relevance of the records or to expand their search. Currently, ALADIN’s default display presents no subject headings. The addition of subject headings to the screen will make the system more helpful to users.

ALADIN search method. Of the five search methods, respondents identified “keyword” as the most frequent method for access. “Subject headings” ranked second, and “author” and “title” tied for the third. A “call number” search was the least used. Consistent with earlier reports that users relied more on keyword searching and tried more subject searches in the online environment, survey respondents searched by keyword and subject heading more often than author, title, or classification number.

Keywords versus subject headings. Findings confirm librarians’ concern that users may not understand the differences between a keyword search and a subject heading search. Although 96 percent of the respondents said they understood the differences, only 15 percent said they used LCSH to find subject headings and 66 percent said, “I use whatever I can think of at the time.” The reported sources of their keywords and subject headings reveal a similar pattern and suggest that many students probably did not know the differences between keyword searches and subject heading searches (see table 5).

Used properly, subject headings enable a searcher to retrieve relevant items quickly, but it is difficult to come up with a subject heading without consulting an authority list, which for most online catalogs is LCSH. It is therefore surprising that few students sought librarian’s assistance in finding subject headings and even fewer consulted LCSH. One possible explanation is that students did not know that they needed to use proper subject headings in subject heading searches. One encouraging sign, however, is that 57 percent of the students turned to the retrieved records for subject heading ideas, although it is unclear whether they examined the subject headings area or the entire records for that purpose. Because students displayed a strong interest in topical searches and many of them conducted subject heading searches with keywords, improvement in this area is critical. As a start, the system could provide on-screen explanations and examples that illustrate the differences between keyword searching and subject heading searching, and librarians could highlight such differences at training workshops. At a more sophisticated level, the system could provide browsing of authorized terms and cross-references, and allow users to find items similar to the records they found.

Advanced search features. Earlier studies reported that advanced features on online catalogs were seldom used. Respondents of this study did use advanced
features, but the use was low. Fifty-six percent of the students used Boolean operators and 37 percent used limiters, but only 21 percent used truncation. It is encouraging that more than half of the respondents used Boolean operators for their searches, suggesting that students are becoming more sophisticated in searching. Librarians, nonetheless, should continue to educate users of the value of Boolean operators because these operators can increase the relevance of retrieved records, if used properly. Because keyword searches tend to retrieve a large number of records, it is understandable that truncation was not used often to increase retrieval. But the need to narrow retrieval is clear. At the focus group interviews, students said they often preferred items owned by their libraries, but only few students knew how to limit their search by location. Judging from their enthusiasm for this feature, students are likely to appreciate some instruction on limiters.

Files searched. Of the nine files in ALADIN, the online catalog file was the most frequently used, followed by the multisubject periodical index covering literature from 1990 to the present time. The other files such as Newspaper Abstracts, ERIC, Periodical Articles 1983–1993, and ABI/Inform were used infrequently. It seems that a catalog to local holdings and an index to recent literature would satisfy most students' needs and that undergraduates had little use for older literature or more specialized subject files.

Views on ALADIN searches. The survey presented descriptions of ALADIN searches with different phrasings to keep respondents from falling into a pattern in responding to them. To make the statistics easier to understand, table 6 rephrases these views in presenting students' responses.

As table 6 illustrates, students' views on ALADIN searches were generally positive. At least 60 percent of the respondents found title, author, and keyword searches easy, whereas more than 40 percent found subject heading searches easy and reducing a search result easy. Forty-one percent did not know whether call number searches were easy, and those who attempted to search by call number were split on its difficulty. Students were similarly divided on the difficulty of expanding a search when they retrieved too little information the first time.

Another way to analyze the data is to focus on the activities with which users experienced difficulty. Search expansion was difficult for one-third of the respondents; subject heading search, call number search, and search reduction posed problems for nearly one-fifth of them; and very few students knew how to conduct call number searches. Considering the strong interest in conducting subject searches, librarians will be doing a great service to students by providing more instruction on these types of searches.
TABLE 7
Views on Research

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research is critical to my future career</td>
<td>96</td>
</tr>
<tr>
<td>Everyone should know about research</td>
<td>68</td>
</tr>
<tr>
<td>It's nice to know about it, but I don't have the time to do that</td>
<td>12</td>
</tr>
<tr>
<td>I would like to know more about it so that I am well prepared for advanced studies</td>
<td>69</td>
</tr>
<tr>
<td>I can always rely on librarians later</td>
<td>4</td>
</tr>
<tr>
<td>I want to do the research myself</td>
<td>52</td>
</tr>
</tbody>
</table>

Experience with Libraries
Student responses to questions on library experience show that they viewed libraries as an important part of their education. They ranked “to work on a paper or an assignment” first and “to meet friends” and “to rest” last as the reasons for using libraries. Sixty percent of the students thought that they knew how to make good use of library resources, whereas 40 percent responded negatively. Librarians can easily address this problem by providing the kinds of assistance students need, such as “information about library collection and services” (57%), “instruction on how to prepare research papers” (49%), instructions for using the library (40%), and a map of the library (38%)

Although 60 percent of the respondents knew how to make good use of library resources, only 46 percent reported success in finding what they needed. The main reasons for the search failure were “holdings failure” (88%) and “items not on the shelf” (69%).

Most students displayed confidence in their understanding of research (44% “good understanding,” 51% “some understanding”). As table 7 illustrates, a great majority of them understood the importance of research and more than two-thirds wanted to know more about it.

Roles of Selected Factors
The author analyzed the relationships between students’ characteristics and their information-seeking behavior by performing Chi-square tests on these variables. The independent variables were race, school, economic background, gender, part-time job, and children. The forty-four dependent variables included the five most popular information channels, three major factors in information channel selection, two most popular methods in learning to use ALADIN, frequency of ALADIN use, remote access to ALADIN, understanding of differences between keyword and subject heading searches, sources of keywords for searching, sources of subject headings for searching, use of advanced search features, views on ALADIN searches, ability to make good use of library resources, success in finding needed information in libraries, understanding of research process, views on research, and reasons for using the library.

Chi-square tests associate race with nineteen dependent variables, school with fifteen, and economic background with nine. Some dependent variables were associated with more than one independent variable. Ideally, multiple correlation analyses

TABLE 8
Use of Information Channel Associated with Race

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-square</th>
<th>Cramer’s V</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>7.521</td>
<td>0.204</td>
<td>0.023</td>
</tr>
<tr>
<td>References</td>
<td>7.912</td>
<td>0.209</td>
<td>0.019</td>
</tr>
<tr>
<td>Print indexes</td>
<td>21.861</td>
<td>0.347</td>
<td>0.000</td>
</tr>
<tr>
<td>ALADIN</td>
<td>13.872</td>
<td>0.276</td>
<td>0.001</td>
</tr>
</tbody>
</table>

p < .05
TABLE 9
Use of ALADIN Associated with Race

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-square</th>
<th>Cramer’s V</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning ALADIN use from library staff</td>
<td>29.734</td>
<td>0.425</td>
<td>0.000</td>
</tr>
<tr>
<td>Frequency of ALADIN use</td>
<td>17.017</td>
<td>0.231</td>
<td>0.002</td>
</tr>
<tr>
<td>Remote access</td>
<td>14.425</td>
<td>0.296</td>
<td>0.001</td>
</tr>
<tr>
<td>Using whatever I think of for keywords</td>
<td>18.528</td>
<td>0.336</td>
<td>0.000</td>
</tr>
<tr>
<td>Using retrieved records to find keywords</td>
<td>7.465</td>
<td>0.213</td>
<td>0.024</td>
</tr>
<tr>
<td>Using whatever I think of for subject headings</td>
<td>11.690</td>
<td>0.267</td>
<td>0.003</td>
</tr>
<tr>
<td>Use of Boolean operators</td>
<td>14.855</td>
<td>0.309</td>
<td>0.001</td>
</tr>
<tr>
<td>Keyword search is easy</td>
<td>19.567</td>
<td>0.247</td>
<td>0.003</td>
</tr>
<tr>
<td>Moving between screens is easy</td>
<td>14.052</td>
<td>0.210</td>
<td>0.029</td>
</tr>
<tr>
<td>Expanding a search is difficult</td>
<td>14.113</td>
<td>0.211</td>
<td>0.028</td>
</tr>
<tr>
<td>Reducing a search is easy</td>
<td>16.602</td>
<td>0.228</td>
<td>0.011</td>
</tr>
</tbody>
</table>

* p < .05

These findings are somewhat troubling because they suggest that African American students have not taken full advantage of information technology. Because most of the White students are enrolling in AU and the African American students in UDC, it could be that AU’s strong library support contributes to its students’ heavy use of ALADIN. Or, it could be that other factors such as time or family may have kept some students from using ALADIN. Test statistics suggest race to be a factor, but further studies are necessary to understand fully its effects on students’ use of online catalogs.

The three groups showed no difference in their reliance on roommates or friends for ideas. Nor were they different in their views on the factors that affected their choice of information channel; all three groups ranked “convenience,” “quality of data,” and “ease of use” as the top three factors.

Table 9 shows that half of the twenty-two dependent variables on students’ ALADIN experience related to the race factor. Available data show that 25 per...
TABLE 10
Experience with Library Associated with Race

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-square</th>
<th>Cramer's V</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowing how to make good use of library resources</td>
<td>9.839</td>
<td>0.238</td>
<td>0.007</td>
</tr>
<tr>
<td>Understanding the research process</td>
<td>14.035</td>
<td>0.200</td>
<td>0.007</td>
</tr>
<tr>
<td>Understanding research process is critical to my future career</td>
<td>8.785</td>
<td>0.232</td>
<td>0.012</td>
</tr>
<tr>
<td>Lack of time in learning more about research process</td>
<td>6.128</td>
<td>0.194</td>
<td>0.047</td>
</tr>
</tbody>
</table>

p < .05

cent of White students, 53 percent of the Asian-Hispanic group, and 73 percent of African Americans consulted library staff. Clearly, all users need some kind of assistance to make good use of the online catalog, and the system is not as user-friendly as librarians had hoped. In their use of ALADIN, students also showed different patterns. White students were most likely to:
- use ALADIN every time they visited a library,
- access ALADIN remotely,
- use whatever they can think of at the time for keyword searches,
- examine retrieved records for keywords,
- use whatever they can think of at the time for subject heading search,
- use Boolean operators in their ALADIN searches,
- consider keyword searching easy,
- consider moving between screens easy,
- have little difficulty in expanding searches,
- consider reducing a search result easy.

But African American students were least likely to use ALADIN in these ways.

Race, however, was not the sole contributor to the different behavior in using ALADIN, because other factors such as economic background also are involved.

Table 10 shows that only four of the fourteen dependent variables on students’ experience with their libraries related to the race factor. Data show that fewer students of the Asian-Hispanic group thought they knew how to make good use of library resources and that more students of this group reported little understanding of the research process than the other two groups.

The three groups differed little in their views on research. They agreed that research is critical to their future career, but more African American students and students of the Asian-Hispanic group said they did not have time to learn about research. The three groups thought everyone should know about research, expressed a desire to conduct their own research, and shared an understanding that knowing how to do research is important for advanced studies.

School As a Factor
Table 11 shows that fifteen of the forty-four dependent variables related to the school variable. Perhaps because most White students were from AU and most
African American students were from UDC, some findings on the school variable are similar to those on the race variable. Of the five most popular information channels, test statistics show that UDC students were more likely to use references and print indexes and AU students were more likely to use ALADIN.

Regarding the use of ALADIN, students displayed the patterns reported under the race variable. The two groups also differed in how they viewed the research process. Data suggest that AU students had more confidence in their understanding of the research process and UDC students were more interested in learning more about research.

**Economic Background As a Factor**

The author coded respondents into three categories to analyze the economic background factor: from families with an income of less than $30,000, those with an income of more than $30,000, and those with no income information. As table 12 illustrates, the three groups showed no difference in their use of information channels or their assessment of the factors that affected their selection of information channels. They showed more dif-
TABLE 12
Dependent Variables Associated with Economic Background

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-square</th>
<th>Cramer’s V</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning from on-screen instructions</td>
<td>7.969</td>
<td>0.22</td>
<td>0.019</td>
</tr>
<tr>
<td>Frequency of ALADIN use</td>
<td>13.927</td>
<td>0.209</td>
<td>0.008</td>
</tr>
<tr>
<td>Remote access to ALADIN</td>
<td>6.535</td>
<td>0.20</td>
<td>0.038</td>
</tr>
<tr>
<td>Using retrieved records for keywords</td>
<td>8.002</td>
<td>0.222</td>
<td>0.018</td>
</tr>
<tr>
<td>Using LCSH</td>
<td>9.204</td>
<td>0.238</td>
<td>0.01</td>
</tr>
<tr>
<td>Using truncation</td>
<td>6.999</td>
<td>0.22</td>
<td>0.03</td>
</tr>
<tr>
<td>Reducing a search is easy</td>
<td>22.046</td>
<td>0.263</td>
<td>0.001</td>
</tr>
<tr>
<td>Understanding of research process</td>
<td>10.195</td>
<td>0.171</td>
<td>0.037</td>
</tr>
<tr>
<td>Doing one’s own research</td>
<td>10.734</td>
<td>0.257</td>
<td>0.005</td>
</tr>
</tbody>
</table>

p < .05

ferences in their experience with ALADIN and their experience with libraries. Test statistics suggest that the most affluent group was most likely to use ALADIN every time it visited a library, the less affluent group was more likely to use ALADIN sometimes, and the no-response group used ALADIN only when an assignment needed to be done. Except for access from campus computers, remote access requires some financial commitment, and it is therefore not surprising that the groups differed in this activity. As for their views of research, the no-response group contributed most to the differences by having more members reporting “little understanding” and showing no interest in doing their own research.

Summary of Findings on Gender, Part-Time Job, and Children
Nearly 60 percent of the respondents were female. Test results show that they were more likely to consult parents than male students were and that, in searching ALADIN, male students were more likely to use Boolean operators. Sixty-seven percent of the respondents reported having a part-time job. Test results indicate that these students were more likely to use ALADIN every time they visited a library and to use the library only when a paper was due. They had less success, however, in searching ALADIN than others. Only 18 percent of the respondents had one to five children, and these respondents were more likely to use print indexes and seek help from library staff in learning ALADIN than those without children.

Variables Affected by Multiple Independent Variables
Seventeen dependent variables related to more than one independent variable. As table 13 shows, race was an important factor that related to most of the seventeen dependent variables. It also appeared often with school or economic background to contribute to students’ use of information channels, experience with ALADIN, and experience with libraries.

Implications
Validation of Established Information Channels
At least 70 percent of the students used online catalogs, book and article references, and librarians, affirming the importance of these channels. Because students favored channels that were easy for
TABLE 13
Dependent Variables Associated with Multiple Factors

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable on Information Channels</td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>Race, Gender, Children</td>
</tr>
<tr>
<td>References</td>
<td>Race, School</td>
</tr>
<tr>
<td>Print indexes</td>
<td>Race, School, Children</td>
</tr>
<tr>
<td>Online catalogs</td>
<td>Race, School</td>
</tr>
<tr>
<td>Variable on Use of ALADIN</td>
<td></td>
</tr>
<tr>
<td>Learning ALADIN from library staff</td>
<td>Race, School, Children</td>
</tr>
<tr>
<td>Frequency of ALADIN use</td>
<td>Race, School, Economic Background, Part-Time Job</td>
</tr>
<tr>
<td>Remote access to ALADIN</td>
<td>Race, School, Economic Background</td>
</tr>
<tr>
<td>Using whatever I can think of for keywords</td>
<td>Race, School</td>
</tr>
<tr>
<td>Using retrieved records for keywords</td>
<td>Race, Economic Background, Gender</td>
</tr>
<tr>
<td>Using LCSH</td>
<td>Race, Economic Background</td>
</tr>
<tr>
<td>Using whatever I can think of for subject headings</td>
<td>Race, School</td>
</tr>
<tr>
<td>Using Boolean operators</td>
<td>School, Gender</td>
</tr>
<tr>
<td>Keyword search is easy</td>
<td>Race, School</td>
</tr>
<tr>
<td>Moving between screens is easy</td>
<td>Race, School</td>
</tr>
<tr>
<td>Expanding a search is difficult</td>
<td>Race, School</td>
</tr>
<tr>
<td>Reducing a search is easy</td>
<td>Race, Economic Background</td>
</tr>
<tr>
<td>Variable on Views of Research</td>
<td></td>
</tr>
<tr>
<td>Understanding of research process</td>
<td>Race, School, Economic Background</td>
</tr>
</tbody>
</table>

them to get to and that contain good information, academic libraries should continue to invest in online catalogs by augmenting their contents with high-quality data. Research and academic institutions also should invest in librarians who have effectively bridged users to information sources. Librarians’ work is much appreciated by college students, and with the incorporation of information technologies into higher education, their roles will probably become more important.

**Improvements to Augmented Catalog, Such As ALADIN**
Because many students preferred exploring ALADIN by themselves, librarians should design online instruction that facilitates self-teaching. The default screen display should include subject headings so that more users will be able to take advantage of the subject analysis librarians provide. In addition, librarians need to develop instruction sheets or an online demonstration module that will illustrate the differences between keyword searches and subject heading searches, and will enable users to decide when a particular type of search will be most effective. To make search expansion and reduction easier, more context-specific help messages should be provided. As for classification number searches, because most users consider call numbers the addresses of items in their collection and few consider them access points, librarians can help them appreciate the retrieval power of classification numbers through instruction workshops or online instruction.

**Enhanced Library Services and Instruction on Research**
Data indicate that students use libraries for serious purposes. Most of them knew
how to make good use of library resources and indicated that collection failure was the main reason for search failure. Librarians can address this issue by improving document delivery and stack management. Because most students appreciate the importance of research and want to conduct their own, librarians can develop courses on information management to introduce students to the research process, the variety of relevant information tools, and the skills to synthesize information from various sources. 

Use of Information Technology and Race

Librarians realize that technology could widen the gap between information haves and information have-nots, and, therefore, advocate equal access for all users. Because this study found that more affluent students tend to use ALADIN more often, less affluent students would certainly benefit from librarians' advocacy for equal access. But the study also found that equal access does not lead to equal use. Despite the same access to the same information system, White students used ALADIN the most and African American students the least. Test results indicate that many factors contributed to the low use of ALADIN, and there are probably many more factors related to this phenomenon. The study identified factors related to students' use of information channels. The exact contribution of various factors and their interaction await further investigation.

Conclusion

Although the study focused on two universities in a particular city, several findings are consistent with earlier studies and confirm librarians' opinions and views about student users. In addition, the study sheds light on the range of information channels college students use, their selection criteria, their use of an online catalog, their self-assessment of library knowledge and research, and the relationships between six factors and their use of information channels. The researchers hope that these findings will encourage library administrators to develop programs and services that will facilitate undergraduate students' information-seeking, provide system designers and managers with ideas for improving information systems, and prompt administrators of higher education to address the special needs of various user groups.

Note: This study was supported by a Cooperative Grant for Faculty from the Consortium of Universities of the Washington Metropolitan Area. The project was conducted with the assistance of Albertine C. Johnson, Chairperson of the Public Services Department at the University of the District of Columbia, and Elizabeth B. Nibley, Reference Librarian at the American University.

Notes

1. See, for example, Larry Hardesty, Student Use of the Libraries at DePauw University, 1980, ERIC, ED 187335; and Tony Mays, "Do Undergraduates Need Their Libraries?" Australian Academic and Research Libraries 17 (June 1986): 51–62.
8. Mays, "Do Undergraduates Need Their Libraries?" passim.


26. INNOPAC and NLS, an in-house system developed for the University of Wisconsin-Madison, both provide searchers the capability to retrieve more items directly from subject headings displayed on the screen. For subject searches, INNOPAC also displays authorized subject headings and cross-references.
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Eileen McIlvaine

Although it appears under a byline, this list is a project of the reference departments of Columbia University Libraries, and notes are signed with the initials of one of the following staff members: Kathe Chipman, Katherine A. Keller, Avery Library; Mary Cargill, Olha della Cava, Robert H. Scott, Sarah Spurgin, Junko Stuveras, Butler Library; Nancy Friedland, Undergraduate Library.

This article follows the pattern set by the semiannual series initiated by the late Constance M. Winchell more than fifty years ago and continued by Eugene Sheehy. Because the purpose of the list is to present a selection of recent scholarly and general works of interest to reference workers in university libraries, it does not pretend to be either well balanced or comprehensive. A brief roundup of new editions of standard works is provided at the end of the reviews. Code numbers (such as DA41 or 1CJ331) have been used to refer to titles in the Guide to Reference Books, 10th ed. (Chicago: ALA, 1986) and the Supplement...Covering Materials from 1985-1990 (Chicago: ALA, 1992).

Biography


This biographical dictionary of French proletarian writers covers the years 1789 to the present, with the bulk of the entries from the first half of this century. Entries range from several sentences to several pages; the longer entries provide bibliographies. To be included, authors must have been from a working-class background, have written in French, and have published at least one book. Although a few of the writers (those who are very well known and whose names fall before J) have longer entries in the Dictionnaire de biographie française (AJ194), most of the writers are not easily found in other sources. More than 100 photographs of writers and their books illustrate the text. Highly recommended for libraries supporting research in French history and literature and labor studies.—S.S.

Ethics


This new CD-ROM from ATLA seeks to respond to the growing interest of students and researchers in questions of ethics—from abortion to environmental preservation, from euthanasia to intellectual property rights. The index, available only in electronic format, takes a multi-
disciplinary approach, addressing the question of ethics from the perspectives of a variety of disciplines. It likewise draws its citations from a broad range of sources—professional and academic journals, general interest periodicals, newspapers, and single- and multiauthor books. As of June, the database contained more than 31,500 records, from 1990 to date; and the editors plan to add more than 20,000 new entries each year.

The search software is the same one available on ATLA’s Religion Indexes (1BB16), with the full range of logical and proximity operators and truncation and wild card searching. Searches are possible in a variety of fields, including general keyword, subject heading, author, title, journal name, publisher, language, year, ISBN, ISSN, and other standard numbers. Browsing of the index for individual fields also is possible. The CD-ROM is accompanied by a user’s manual, a quick reference guide, and a list of journal titles indexed.

Although a number of the titles listed here are indexed in various other sources, this is the only database to bring this broad range of materials together into a single place. As such, it promises to be an interesting addition to the collection of any institution where research on ethical issues is a major part of the program.—R.H.S.

Literature


The Supernatural Index includes more than 21,300 stories in some 2,100 anthologies published in English from 1813 (Tales of the Dead) through 1994. The bulk of the index lists works by author, providing a full citation to each anthology, as well as information about the first publication of each story. Nearly 8,000 writers are represented and the author index reads like a who’s who of world literature, with entries for Shakespeare, the Brontes, George Eliot, Kafka, Dickens, Dostoevsky, and Dumas, as well as Du Maurier, Lovecraft, Conan Doyle, Mary Shelley, L. P. Hartley, Ray Bradbury, Edith Nesbit, and even P. G. Wodehouse. The Supernatural Index also provides a contents list for each anthology (with full bibliographic citation and original price), an editor index, and a short story index. It lacks a subject index for the reader who remembers only the creepy governess or that the story was set in Chicago, so it will be most useful for searching for known items, finding translations, and tracing the publishing history of anthologies of supernatural tales. Recommended for libraries of all sizes.—S.S.
There are entries for about forty-five writers in the four books; and, in some instances, an entry is repeated, almost verbatim, in one of the other books. For each writer, there is a brief biographical sketch, several lengthy quotes from leading critical studies, and a bibliography of the author's published works—useful but minimal information for those wishing to be introduced to this group of authors.

A far more thorough introduction to this group, their writings and literary criticisms can be found in either the multivolume Black Literature Criticism (Detroit: Gale, 1992. 3v. $275) or in several volumes of the Dictionary of Literary Biography (Detroit: Gale, 1978—; BD416, 1BD52, especially volumes 50-51, $128 each), where all but four of the writers have biographical sketches and bibliographies that are considerably more substantive. Even with the price difference, I would recommend these two sources over the four works in question.—O.D.C.

Dictionnaire des œuvres du XXe siècle: littérature française et francophone.
This is a sequel and companion volume to Dictionnaires des grandes œuvres de la littérature française (Paris: Robert, 1992; 706p.). Some 150 entries cover literary works, in a broad sense of the term, which were written in French and published since January 1, 1901, along with fifty-seven entries on literary magazines and seventy-three articles on movements, genres, and other special topics such as painting and literature, postmodernism, and comic books.

Similar in organization to its predecessor, each entry gives an analysis of the work, its literary context, and its relation to other works and the life of the author, followed by a bibliography of editions and critical studies. Topics, works, and journals are arranged in one alphabet. The volume ends with a chronology (literature, political events, science and technology, music, cinema), and author, and title indexes.—J.S.


Literary history can have nonliterary uses, as this ingenious bibliography shows. It is a list of some 600 works of German literary history written from 1827 (when August Korberstein's Grund-riss der deutschen Nationalliteratur was published) through 1945. Naturally, there were many more works published on that subject during this period, but the model introduction clearly explains the purpose of the bibliography and the reasoning behind the choices: to show the use of German literary history in order to develop a sense of German identity during the nineteenth and early twentieth centuries. Thus works intended for a narrow academic audience are excluded, but literary textbooks (excluding pure anthologies) and surveys intended for a general audience are here. The works included must cover at least a 30-year period, be written in German, and discuss German literature as a whole, not regional or local developments.

The entries are arranged alphabetically by author. An extensive series of indexes provides access by title, publisher, date, period covered, intended audience (women, schools, children, etc.), and ideology (nationalistic, anti-Semitic, etc.). The work also includes brief biographies of the authors, with citations to other biographical sources. Students in both German literature and modern German history should find this imaginative bibliography extremely useful.—M.C.

Cinema
This Lexikon provides brief summaries and evaluations of more than 600 significant German (including Austrian and German-speaking Swiss) films from the silent era to the 1990s. There also is a separate section with biographical information on directors that includes citations to additional secondary sources, and a listing of additional sources on German films in general. The list of German film journal titles, divided into those published before 1945 and those after, should be a useful resource. Unfortunately, there is no index of actors, nor any way to find out which films of a specific director are listed. This is a useful resource for brief information on German films, but libraries that own more complete guides, such as Cinegraph (1BG87), will not need this one.—M.C.

Art and Architecture


An expansion of *Historic America* (1983) that adds some 14,000 more structures, *America Preserved* is the ideal companion volume to the *National Register of Historic Places 1966 to 1994* (reviewed in this column most recently). The checklist covers all records held by the Historic American Buildings Survey (HABS) and the Historic American Engineering Record (HAER); HABS is the only one of the WPA programs begun in the thirties that continues today. It is our country’s first effort to record systematically our built environment and has been the source of numerous published catalogs featuring individual states’ records.

Listings in both *America Preserved* and the *National Register* are arranged by state and divided into counties; however, the present volume further subdivides counties by town(s) and provides an index by state, within which one can locate the appropriate county name for a given town. Data provided for each site are derived from the database maintained by the National Park Service since 1982 for holdings there and at the Library of Congress, and are current through March 1994. An entry includes location, HABS or HAER inventory and shelf list number, and an indication of number of color transparencies, measured drawings, field records, photograph captions, pages of text, and photographs for a given site. Like the *National Register* volume, *America Preserved* incorporates a selection of representative images from the collection, in this case numbering over 300,000 items. The collection covers not only the states and District of Columbia, but also Puerto Rico, the Virgin Islands, Canal Zone, and Guam.—K.C.


This heavily illustrated biographical dictionary of furniture designers, firms, movements, manufacturers, and design schools betrays a French bias, which was not totally unexpected in a French publication. Bias aside, however, this reference work is a worthy addition to an academic or museum library with a strong decorative arts and/or furniture collection.

Kjellberg, who has written extensively on French furniture history, begins this work with a sixteen-page essay on the history of twentieth-century furniture. The lack of bibliographical references within this essay, and within the entries themselves, is somewhat compensated for by the five-page bibliography at the end of the volume. The bibliography is divided into the following categories: General Works, Art Nouveau, Art Deco, Contemporary, Exhibitions (arranged chronologically), and Monographs and exhibition catalogues arranged by designer. The French bias is particularly evident in this last section. For example,
for the one book each on Charles Rennie Mackintosh and Frank Lloyd Wright, there are five entries for Jacques Émile Ruhlmann. A helpful addition to this section is a chronological listing of the major French design magazines, with their date(s) of publication, and a listing of eight major foreign magazines devoted to this area. Another very useful feature is a listing of museums that have strong collections of twentieth-century furniture. The coverage of the Paris museums is particularly detailed. Other French museums and foreign museums with their collection strengths (by period and designer) also are included.

This work is confined primarily to major twentieth-century furniture designers and is international in scope. All styles and periods are represented, from Art Nouveau to Bolidismo, from Eileen Gray and Henry Van de Velde to Andree Putman and Philippe Starck. Entries, in essay format, contain standard biographical information and are written in a qualitative style. Some entries are rather short, such as that for the architect Norman Foster, which includes one color photograph. The emphasis is on his furniture design. The entry for Émile Gallé, conversely, spans ten pages and has eighteen photographs, in color and black and white. Although well illustrated, very few works are shown in situation—a definite weakness. But when compared to the much shorter Gallé entry in Mel Byars’s Design Encyclopedia (London: Wiley, 1994; 612p.), Kjellberg’s extensive knowledge and enthusiasm come through.

For information on twentieth-century women designers, consult Frauen im Design: Berufsbilder und Lebenswege seit 1900 (Stuttgart: Design Center Stuttgart, 1989; 2 vols.), in German and English, an exhibition catalog devoted to twentieth-century European women designers, primarily German. Included is an illustrated biographical section on twenty-nine “international pioneers” with exhibition, award, and bibliographical information.

Le Mobilier du XXe siècle fills an important gap as a well-illustrated biographical dictionary with evaluative essays, with its strength in French designers. Perhaps an English edition will be forthcoming.—K.K.

Ethnic Studies


There are several reasons why this guide is an invaluable resource to the student interested in attending a historically Black college or one that, though not historically Black, has a predominantly Black enrollment.

The preselection, both famous and lesser-known schools are included, makes combing through voluminous general guides to American colleges and universities unnecessary. Moreover, its focus on only 118 institutions—91 four-year, 22 two-year, and five professional schools—means more comprehensive entries than are usually found in more general guides. Along with such standard information as address, phone numbers, cost, admissions and graduation requirements, etc., there is information on the school’s history, the faculty and student body, the majors and preprofessional programs offered, the grading system, the athletic programs, the library holdings, and student life in general. Particular attention is given to financial aid information and information on special programs such as continuing education, honors, internships, study abroad, and off-campus study programs. Much of the information, the compilers assure us, is supplied directly by the institutions.

The book’s straightforward arrangement (by state and then alphabetically by name within each state), clear layout, intelligible presentation, and variety of indexes make it very easy to consult. Preceding the body of the work are several
brief, but useful essays, including an overview of the evolution of historically Black colleges and universities, hints on finding the most suitable school, and help on how to look for funds. Any library that serves Black students should have this work.—O.D.C.


This handy guide gives librarians and information professionals a useful list with which to classify and retrieve African American-related materials. It also can serve to introduce students and faculty to the complexity of organizing information about the African American experience. Subject control of any interdisciplinary area is problematic, but when one adds to it the variability and fluctuation of language that has been used to speak about African Americans, one can appreciate the service this work renders.

What the compiler has done is to extract from the multivolume sixteenth edition of the Library of Congress Subject Headings (LCSH) all those headings that not only pertain directly to African Americans, such as "Creole dialects, English," but also the many others, such as "Consumer credit," for example, that apply to all and yet are in some way relevant to African Americans. The result is an alphabetically arranged list of 5,000 topical, corporate name, and some personal name headings that can guide the librarian in the organization and retrieval of information related to African Americans. The headings are listed in the familiar—at least to librarians—format of the LCSH, including scope notes, cross-references, and listings of broader, narrower, and related terms. A detailed introduction to the arrangement of the guide helps orient the uninitiated to the mechanics of the LCSH format. Bowing to current usage, the compiler has made two important alterations in terminology: the official LCSH "Afro-Americans" has been changed to "African Americans" and the heading "African American Universities and Colleges" has become "Historically Black Colleges and Universities."

A significant contribution is the presentation of examples of complicated entries with many subheadings to act as models for similar entries; thus the entry "National Association for the Advancement of Colored People" and its 184 subheadings serve as the model for all corporate bodies, "Martin Luther King, Jr." for individuals, "Toni Morrison" for individual literary authors, "Lincoln University" for educational institutions, and so on. This work is a useful addition to any institution that collects information on African Americans.—O.D.C.

Historical Statistics of Black America.

In 1990 Carrell Peterson Horton and Jessie Carney Smith published the second edition of Statistical Record of Black America (1CC211), a voluminous register of African American statistical information. Now they have enriched the field with a two-volume companion work, Historical Statistics of Black America. Whereas the former concentrated on statistical information covering the past twenty years, the latter takes many of the same subject areas—education, labor, population characteristics—and extends the coverage back to the early seventeenth century.

Historical Statistics of Black America is a monumental compendium chronicling the "conditions, status, and experiences of African Americans" (Intro.) from 1619 to 1975, telling us, for example, the location of Black farms in 1930 by type of farm and by geographic region, or the colleges and universities with Black inductees into Phi Beta Kappa during the period 1874—
1916. In total, there are 2,320 tables covering nineteen topics, including large sections dealing with Agriculture, Education, Labor, Population and Vital Statistics, as well as smaller sections devoted to Business, Crime, Family, Housing, Income, Media, the Military, Politics, Religion, Slavery, and Sports, all further divided by subtopic. Access to the data is through either the topically arranged table of contents, which lists the full title of each statistical table, or a back-of-the-book subject index. Because the chronological evolution of the African American experience is partly lost as a result of the topical presentation, an index by year is also provided.

Most of the material assembled here has come from U.S. government publications, but much was also drawn from publications originating at African American institutions or coming from African American authors, such as, for example, The Negro Year Book (1947, 1952; CC425) or The Negro Handbook (1942-1949; CC421). The work contains no narrative text at all, except in some rare instances when a statistical narrative is cited in lieu of a table. The tables are extremely well documented. Each has a footnote designating the source, or sources, of the information and noting any facts that need to be considered in interpreting the numerical data. A bibliography of these sources is included. Moreover, the tables are visually crisp, clear and uncluttered, and use a large enough typeface to make them legible. Comprehensive, thorough, and easy to use, this work is highly recommended for any library.-O.D.C.

Tong, Diane. Gypsies: A Multidisciplinary Annotated Bibliography. Garland Reference Library of Social Science, 579. New York: Garland, 1995. 399p. $60 (ISBN 0-8240-7541-2). LC 94-36437. The disciplines referred to in the subtitle are used as chapter headings, which range from anthropology to women. Within each chapter, entries are arranged alphabetically by author. Unfortunately, there are no geographical or chronological subdivisions, which is a drawback for a wide-ranging topic such as Gypsies. Browsing can seem a little breathless. In the anthropology chapter, for instance, an article on "Gypsies in California" is followed by "The Manufacture of Pots and Pans among the Gypsies of Kosovo and Metohija."

There is a detailed subject index, which, though helpful, must be used with care. There are entries, for instance, under "Britain," as well as under "England," "Wales," and "Scotland," with no cross-references. "Travellers," a slang term for Gypsies in the British Isles, appears, as does "Gypsy groups." "Germany" is a heading, as well as "Nazi Germany." I could find no entry in the subject index that would lead to works on the origin of the Gypsies though I did find a few works that discussed this topic in the history chapter.

The author lists popular and scholarly works (books, articles, and dissertations) written from about 1960 through 1992, though many earlier works are provided, particularly in the bibliography chapter (a very useful selection). The fiction (adult) chapter also includes many pre-1960 works, though perhaps the most famous novel about the Gypsies, George Borrow's Lavengro, is not listed, whereas Jane Eyre and Emma are listed.

The works included are almost all in English. It is surprising to find a work intended for the academic audience stating, "Some of the most progressive recent work is published in Germany, and since I don't know German well, I've included some unannotated references to works that look intriguing" (Intro.).

The author has compiled some useful material, and the annotations are thorough, though somewhat ideological. She dismisses much of what is written as a "poisonous brew of racism and sexism" (p. 95). This work will be a useful addition to ethnic studies collections, but se-
rious researchers will need to use additional sources.—M.C.

Marxism


This monumental (vol. 1, pt. A, reaches avant-garde), long-term project (estimated completion date is 2000) is an encyclopedia of Marxism in its broadest sense. It defines and discusses terms—no individuals are included—used by Marx and comments on their application by later doctrinaire and not-so-doctrinaire followers. As an historical encyclopedia, it also includes concepts, such as antifascism, that later Marxists wrote about.

There is a wide variety of subjects. The first volume has entries ranging from Arabic socialism, reduction of working hours, atheism, and aesthetics. Each entry, signed by one of the more than 500 contributors, summarizes the main ideas of Marx and other important Marxist thinkers, and provides a bibliography of major primary and secondary sources, including works in English. All large social science and history collections will need this work.—M.C.

World War II


A collaborative work of archivists of the Archives Nationales and historians at the Institut d'Histoire du Temps Présent, the guide inventories available French historical sources on World War II regardless of format and place of conservation. Included are materials on paper and in audiovisual media, images, and sounds, as well as texts drawn from all types of organizations: public, private, archives, libraries, and museums in France and French overseas territories.

Roughly one-third of the entries are devoted to the Archives Nationales in Paris and Fontainebleau (Centre des Archives Contemporaines) and the Centre des Archives d'Outre-mer in Aix-en-Provence. The sources in the Archives Nationales have diverse origins: most typically, they come from ministries and public administrations along with donated, purchased, or consigned private archives. Some were part of the archival records collected by archivists for the Haute Cour de Justice, established in November 1944 for trials of officials of the État Francaise and then removed from the trial documents to be transferred to the Archives. The archives of the late Third Republic, which were abandoned in Tours, were incorporated into the Archives Nationales only in 1989. Telegrams from 1940–44 were discovered in the central post office of Vichy as recently as 1994.

The material is divided into four parts: (1) holdings of the Archives Nationales; (2) Ministries, Parliament and Conseil d’État; (3) local administration, departmental, and municipal archives; and (4) other institutions such as libraries, banks, chambers of commerce, research centers, museums, and associations.

The holdings of the Archives Nationales are listed in order of their classification scheme. Description is detailed enough to allow researchers to make a preliminary selection of records they want to consult in person. Available research tools, from typed inventories to published works, are listed whenever applicable. Departmental and municipal archival resources are listed under topics such as general administration, agriculture, social services, economy and industries, purges, civil defense, war damages, labor, prisoners of war, reconstruction, refugees, rationing, and so on.

The index by names and topics allows researchers to find these subjects across geographic and administrative bound-
aries. The index is hard to use, however, because many entries are too broad. Look up, for example, “communes” and you find almost one whole column of page numbers with very few subtopics. A CD-ROM version of this guide with a good search engine would have increased its usefulness. The guide has three maps: France under occupation and German military command posts in France in March 1941 and August 1944.—J.S.


Fifty years after the end of World War II, scholars primarily from England but also from the United States, Australia, and former enemy countries collaborated on this reference book. The work covers World War II as defined in current Anglo-American usage, namely the time period from September 1, 1939, to September 2, 1945. Its primary object is to explore the factors that shaped the world of today. Topics, which range from what could be roughly defined as military history to social history, were selected because of their “interest and relevance for current study.” “African Americans at War” has a handy table of enlisted African Americans by category (p. 7).

All articles are signed and many include a short bibliography. They vary in length from a few lines to several pages, for example, eight pages on religion and six pages on lend-lease. Typical articles discuss countries, military leaders, battles, organizations, ships and aircraft, events and general topics (prisoners-of-war, medicine, for example). Even a more specific topic, such as frogmen, not only gives the definition and describes its Italian origin, but also surveys the use of similar underwater teams by the United States and Japan, thus giving a wider scope to the topic.

Articles on countries that were major participants in the war give some structure to this dictionary. A typical article on a country is about thirty pages and is subdivided into six to ten sections: introduction; domestic life; war effort; economy; government; defence forces and civil defence; intelligence; merchant marine; and culture. For some countries, appropriate special topics are added—for example, Northern Ireland and Empire for the United Kingdom.

The work gives a comprehensive, one-volume coverage of the history of the world during the war. Topics encompass the varied aspects of life in the midst of the war, from wartime civil defence in London to Nazi concentration camps and a range of tools of war from quaint carrier pigeons to atomic bombs. The generally moderate, scholarly tone of the work makes it suitable to all levels of readership from high-school students to professional historians. Numerous maps, charts, photographs, a chronology, and a table of place-name changes enhance the volume.—J.S.


The Viking Atlas of World War II, a mix of narrative texts and maps, somberly starts with the table of the estimated loss of life in the war. A chronology covers from the end of World War I to November 1945. The book divides the time period into five stages: the interwar period, the Axis ascendant, turning the tide, Allied offensive, and Allies victorious. The maps and text follow a chronological order, covering both European and Pacific fronts.

Although this atlas makes some effort to bring out salient features of the war using quotations from those directly in-
involved in the war, the work is not a thoroughly thought-out and executed job. Corregidor on the map (p. 207) is wrongly located at the tip of the Bataan peninsula, although the location is correctly identified as an island off the peninsula elsewhere (p. 97). Some full-page reproductions of paintings are neither informative nor artistically interesting. Maps tend to be overcharged and do not use colors effectively. The Oxford Companion to the Second World War (above) does a better job of conveying information with black-and-white maps. If one needs to make a choice among innumerable reference works on World War II, which lately crowd bookstore shelves, this is probably not the first pick.—J.S.

History and Area Studies


New York City enjoys a reputation for age, size, extreme density, noise, entertainment, etc., which Professor Jackson and his coauthors have done much to address. Some 4,300 articles by sixty-eight authors provide basic, usually brief information on groups, neighborhoods, people, events, and topics. A few subjects, such as literature, dance, filmmaking, government, and politics, are given quite lengthy coverage. Many articles give at least one bibliographic citation to lead on to further research. The articles are well illustrated with clear photographs, but it is the additional tables and charts that show amazing work—for example, tables of ferry routes, major fires, organization of the railroad, a list of songs and compositions inspired by New York City, tables of eighteenth-century newspapers by date of the first issue, and a list of ticker-tape parades. The volume ends with an index of names of people who are not the subject of individual entries.

One has such fun browsing, stopping to read articles such as community gar-
dens, the Bronx, Diamond Jim Brady. Because New York is such a microcosm, there is much here for everyone.

And, of course, one can nitpick—for example, why an article on Dannon but not Haagen Dazs, Planned Parenthood but not Concern For Dying, why not a list of novels with a specific neighborhood as their setting, why a description of orphan trains but no identification of them as such, why Lou Gehrig but not Joe DiMaggio (it can't be that only people not living were included because David Dinkins and Rudolf Giuliani are there)? Even with cross-references, it is still the lack of a good subject index that is the chief drawback. For example, there are articles on homelessness and poverty but not on welfare or foster care, and there is no index to bring all the articles together on the public welfare system.

Still, this is a remarkable work showing much care in compiling it with a clearly defined purpose and great accuracy. It will be heavily used by anyone from junior high schools, public libraries, or research libraries who is interested in New York City.—E.M.


This volume offers very thorough coverage of a historic event that is certain to long excite the interest of historians, the Russian Revolution; and given the seeming end to the era to which that revolution gave birth, the timing of its appearance seems appropriate. Contained within this volume are approximately 4,000 citations to books, articles, and dissertations in English relating to the history of Russia from 1905 to 1921. As the author notes, the only area in which a conscious effort to limit listings was in the field of literature, and the depth and range of coverage is indeed impressive.
It is hard to think of a relevant author or work that has not been included in this compilation. To be sure, no work is ever completely comprehensive. A search of the RLIN and Historical Abstracts (DA20) databases does yield a few more titles of relevant works in English, and the initial listing of reference works and bibliographies seems unduly narrow, but these do nothing to diminish the valuable service the author has performed in bringing together so much of the English language literature on the topic in one place.

The entries are not annotated, but a detailed and logical arrangement of the contents by topic facilitates the location of the appropriate information, as do a personal name index and a subject index (the latter simply an alphabetic arrangement of the many topical headings into which the work is divided).

In short, this is a work that most libraries with serious coverage of Russian or even simply general world history will want to acquire, for it places in the researcher's hands an ample survey of the work done to date on a key historical event.—R.H.S.


A timely effort, this reference work "provides immediate access to current scholarship on the presence and influence of Islam on a global scale" (p. ix). With 750 articles contributed by more than 450 authors, the encyclopedia represents a wide range of disciplinary perspectives illustrating the Muslim experience through political, social, and historical events and theories.

Authoritative reference works such as the Encyclopaedia of Islam (BB524, 1BB125) and the Cambridge History of Islam (Cambridge: Cambridge Univ. Pr., 1970; 2 vols.) have relied on classical texts providing extended discussions of classical and medieval history. It is the effort of The Oxford Encyclopedia of the Modern Islamic World to supplement and distinguish itself from these previously mentioned works in three ways: (1) by focusing on the modern world, roughly beginning with the end of the eighteenth century to the present; (2) representing methodologies of the social sciences and humanities; and (3) drawing on comparative studies. For example, there are entries for the Nation of Islam, Palestine Liberation Organization, and, in a recurring, comparative format, the entry on Muslim Brotherhood is composed of separate articles that present an overview and discussion of the organization in four representative countries.

The arrangement of the encyclopedia is alphabetical with articles that range from major essays on larger theoretical topics to briefer entries for descriptive topics, including succinct and comprehensive entries for people, places, events, organizations, movements, theories, religion, law, politics, literature, and art. Each entry is enhanced by cross-references and bibliographies for related and further readings. The longer essays include a table of contents at the beginning that outlines the coverage of the topic. Useful bibliographic essays appear under the headings for "Periodical Literature" and "Reference Books." The work is geared toward the scholar, student, or general reader, and provides a very good index, a synoptic outline of contents to highlight the conceptual scheme of the encyclopedia, and a directory of the many contributors.—N.F.


The sweeping changes of the past seven or eight years in the former Soviet Union have brought to the fore a new and changing array of actors, depriving specialists as well as interested laypersons alike of the relatively easier orientation to person-
nel than was possible under the traditionally more stagnant Soviet regime. Hence, the appearance of a guide to the new cast of characters is a welcome event.

The latest such offering, *Who's Who in Russia and the CIS Republics*, offers a listing of approximately 1,100 prominent figures in government, business, public organizations, cultural institutions, and sports and entertainment in Russia and the other republics of the Commonwealth of Independent States (CIS), with a decided emphasis on Russia. Edited by Vladimir Morozov, the book is published under the auspices of VIP, a Russian magazine on "politics, public affairs, and business." The biographical information has been provided by the listed individuals themselves. A typical entry contains information on the individual's current position, date and place of birth, nationality, education, career, major publications, family, and home and office addresses. Listings by profession and by organizational or governmental affiliation provide an additional means of searching out entries, and a list of the recipients of honors and awards (but not the awards they received!) and a list of published works cited in the various entries also are provided.

Comparisons are most likely to be drawn to *Who's Who in Russia and the New States*, eds. Leonard Geron and Alex Pravda, and published by I.B. Tauris in 1993. The focus of the two works is slightly different, as the newer volume makes no effort to cover the Baltic states, which are not part of the CIS, but the divergences are, in fact, much greater than this minor difference might suggest. The earlier volume contains many more entries, approximately two to three times as many. Conversely, the amount of data contained in each entry, which appears not to have been provided by the individuals themselves, is considerably briefer. Moreover, the 1993 work is much more heavily focused on the political, although some other areas are represented as well. For all of these reasons and also, no doubt, because of the rapid changes still taking place in Russia and the CIS, there is a fairly small degree of overlap in coverage between the two volumes. Comparing the listings for the letters Z and BA-BE, for example, one finds eighty-eight entries in the Morozov volume and 235 in the Geron and Pravda volume, with only thirty-one individuals appearing in both works.

In short, it would appear that both volumes are needed for a library to provide broad English language orientation to the evolving Russian scene. It is, as the introduction notes, "designed to be a handy desk reference for researchers, journalists, business people, diplomats, and students."—R.H.S.

**New Editions and Supplements**

Bryan and Valerie Falk continue to compile the *Personal Name Index to the "New York Times Index, 1975-1993 Supplement* (Sparks, Nev.: Roxbury Data Interface, 1995, vols. 1-3, A-Kor. To be in 6 volumes; $86.75 per volume). The original *Personal Name Index to the Index* for which this is a supplement covers 1851-1974 (AF79, 1AF12). This new compilation supersedes earlier indexes for 1975-1979, 1975-1984, and 1975-1989.

The annual printed version of *Index Translationum* (AA169) ceased in 1992 and has been replaced by a CD-ROM version (Paris: Unesco, 1994-, $1,200). The CD-ROM will be updated annually and will cumulate from 1979; the 1994 disc includes translation published from 1979 through 1992, with a few works appearing in 1993. A user guide is included on the disc, which is easy to print out, and there are content-sensitive help screens. The file can be searched by author, title (though the original title is not consistently provided), country of publication, language (both original and language of the translation), translator, publisher, broad subject, or any combination of these.—M.C.
Several indexes to multivolume sets have been published this year. *Dictionnaire de spiritualité: tables générales* (Paris: Beauchesne, 1995; 732 col., BB239) provides a topical index (including personal names) to the set. Also included is the Liste de collaborateurs, naming the individual authors and their contributions (41 unnumbered pages). *The Bibliographie der deutschenprachigen Arabistik und Islamkunde* (Frankfurt: Institut für Geschichte der Arabisch-Islamischen Wissenschaft; 1DE8) offers with volume twenty (1995; 383p.) the Personenregister and the Register der Primärliteratur (by title) with reference to volume and page. *Poggendorff's Biographisch-literarisches Handwörterbuch zur Geschichte der exakten Naturwissenschaft* (Berlin: Adakemie-Verlag; EA232) is the standard biographical resource for the natural sciences. Volume VIIb covers scientists not German or Austrian or Swiss who flourished during the period 1932–1962. Now the compilers have issued a *Bibliographie der Periodika* (1994; 368p.) for those abbreviations of journals used in this part. Reference for each is given to a list of union lists, library catalogs, and descriptive notes.

Donald J. Winslow updated and expanded his dictionary *Life-Writing: A Glossary of Terms in Biography, Autobiography, and Related Forms* (Honolulu: Publ. for the Biographical Research Center by Univ. Hawaii Pr., 1995. 76p. $5; 1st ed. 1980) to include over 100 new terms (for example, biodigm, autogynograpy), to add to entries (for example, postmodernism), and generally to revise the dictionary. “I try to confine myself to terms concerned with literary genres and with the general human condition” (Pref.).

Jacob Blanck’s *Bibliography of American Literature* (BD364, 1BD151) covers some 280 American authors from the late eighteenth to the early twentieth century in nine volumes. Professor Michael Winship, who completed volumes 7 through 9, now offers indexes to the set. *Bibliography of American Literature: A Selective Index*, with Philip B. Eppard and Rachel J. Howarth (Golden, Colo.: North American Pr., 1995; 345p. $70) for titles (primary titles, variant titles, binders titles, series titles), dates (chronological by the year on the title page or copyright notice), and United States and foreign publishers (alphabetical by city, then publisher, then year).

Further riches include Winship’s *Epitome of Bibliography of American Literature* (Golden, Colo.: North American Pr., 1995; 325p. $55), also with Eppard and Howarth. This is a condensed or abridged form of the Bibliography including “those items given full entries” and then “only primary works in separately published books.” An asterisk indicates that “significant additional information will be found in the full BAL entry” (Intro.).

Just published is the second edition of *A Bibliographical Guide to the Study of Western American Literature*, compiled by Richard W. Etulain and N. Jill Howard (Albuquerque: Univ. of New Mexico Pr., 1995; 471p. $39.95; 1st ed., 1982. BD365). The volume lists secondary literature on about 400 major authors who wrote mainly about the western part of the United States, including such writers as William Sydney Porter (a.k.a O’Henry), D. H. Lawrence, Owen Wister, and The Beats. This new edition includes almost everything and everyone from the first edition except for master’s essays, introductions, a few older volumes, and brief essays which were dropped. Added to the topical section are listings of materials on women and western literature and the environment and western literature, as well as about thirty-five new authors (for example, Louise Erdrich and Ursula LeGuin). Author index only.

literature and research aids, to 1993 with a few last-minute additions in November 1994. Added also is a theme index (robots, fantastic voyages) and a series index; omitted, though, are citations to any science fiction tale that has not been translated into English. If your library is very interested in this topic, you will want to retain the third edition, which has 206 pages of titles in foreign languages. Barron states that he expects this to be the last edition he will compile.

It is indicative of a recent publishing trend that the four titles cited here for art and architecture are biographical dictionaries. The third edition of Colvin's *A Biographical Dictionary of British Architects 1600-1840* has just appeared, this time from the Paul Mellon Centre for Studies in British Art (New Haven, Conn.: Yale Univ. Pr., 1995; 1264p. $65). First published in 1954 under a slightly different title, with a second edition in 1978 (BE294), the new edition adds over 160 biographies and 2,000 buildings. Appendixes continue to be extremely useful and include a listing of names from the 1954 and 1978 editions excluded from the 1995 edition.—K.C.


Bernard Oudin's *Dictionnaire des architectes* (Paris: Seghers, 1994; 663p. 198F) was first published in 1970. The revision and enlargement also incorporate a few topics along with proper names, and retain and expand the small glossary and excellent building index, arranged by country and city.—K.C.

The definitive source for Danish artists' and architects' biographies has been published in an expanded and wonderfully thorough multivolume set, *Dansk Kunsthistorisk Leksikon* (Kobenhavn, Denmark: Munksgaard, 1994—, vols. 1–3, A–Iverson. In progress). The first edition by Philip Weibach had the title *Dansk Kunsthistorisk Leksikon* (1877–78), the second edition had the title *Nyt dansk Kunsthistorisk Leksikon* (1896–1897), and a third edition was entitled *Weibachs kunstnerlexikon* (1947–1952). Entries cite all pertinent personal data, including awards, exhibitions, bibliography (sometimes extensive), and critical comments, for individuals born through the late 1950s.—K.C.


*Bibliographies of New England* offers a volume for each of the New England states and a volume for the region (DB121, 1DB49). With volume 9, *Further Additions to 1994* (Hanover, N.H.: Univ. Pr. of New England, 1995; 299p. $40), the compiler, Roger Parks, adds some additional 4,231 entries for books, dissertations, pamphlets, and journal articles mainly published since 1989, though earlier omissions are included. The arrangement is geographical with at least one library location; it is indexed by authors/editors/compilers and subjects and place names. The compiler indicates he is planning to continue bibliographical coverage of the region.

Chris Cook and the British Library of Political and Economic Sciences provided researchers with an archival guide for 1900–1951, *Sources in British Political History* (DC287). Now Cook and David Waller have extended that coverage for the period since 1945: *St. Martin's Guide*
to Sources in Contemporary British History [(New York: St. Martin's Pr., 1994; 2 vols.; Vol. 1: Organisations and societies (372p.; $69.95); Vol. 2, Individuals (383p.); British title: Longman Guide to Sources in Contemporary British History (Harlow, Essex: Longman, 1994. 2 vols.)], based on a survey conducted by the British Library of Political and Economic Sciences. Volume 1 of the new guide concentrates on locating papers of "political parties, trade unions and other organisations directly involved in politics and political controversy . . . though many of the societies mentioned . . . are not primarily or even partly political organisations, yet their archives can be of value to the historian in putting political facts into context and tracing the interaction between politics and the people" (Introd.). There also is an appendix for organisations of Northern Ireland. The second volume describes the careers and the archives, with notes on the location and availability of the records, for "more than 1000 individuals involved in British politics and public life after 1945" (Introd.).

Cook also has compiled The Making of Modern Africa: A Guide to Archives (New York: Facts on File, 1995; 218p. $35), which offers similar coverage of more than 1,000 private papers covering the period 1878 to the end of colonial rule. Arrangement is alphabetical with a brief description of the person's career followed by notes on the location and contents of the archive. Two indexes complete the volume: lists of archives and of subjects. One is happy to note that Professor Cook sees future editions that will include the "ever-growing corpus of personal archives from black Africa itself" (Pref.).

The Cambridge History of Latin America, vol XI: Bibliographical essays, edited by Leslie Bethell (Cambridge: Cambridge Univ. Pr., 1995; 1043p. $89.95) brings together all the bibliographical essays from the earlier volumes. These have been updated and expanded to include publications at least to 1990 with some to 1992, together with a few previously unpublished essays. The 141 bibliographic essays by 119 authors concentrate mainly on secondary literature in books, chapters in books, articles, and Ph.D. dissertations in English, Spanish, and Portuguese, with a few citations for French and German materials. The volume concludes with an author index to all the items cited.

The second edition of Roderic Aicamp's Mexican Political Biographies was published in 1981. Now about fifteen years later, the third edition has been published (Austin: Univ. of Texas Pr., 1995; 985p. $55) to provide "biographies of public figures, living or deceased, who have been prominent in Mexican political life from 1935 to mid 1993" (Note). In this edition "of the original 1,350 biographies, more than half have undergone significant additions or changes" and there are 600 new ones, all with updated bibliographical references. The appendix lists the most important elected or appointed political positions, for example, senators and deputies, Supreme Court justices, and so on. In this edition, these lists have been extended to include the names of oficiales mayores, union leaders, and several new ambassadorial positions. Interesting, too, is the "Selective Bibliographical Essay" which evaluates the sources of information used in compiling the dictionary.

Useful also to those studying Mexico is volume 8 of the Diccionario histórico y
biographico de la Revolución Mexicana: sección internacional for foreign organizations, people, and events that have had an impact on the Mexican Revolution (Mexico: Instituto Nacional de Estudios Históricos de la Revolución Mexicana, 1994; 458p.). These include such examples as the Agency of Private Detectives, Mary Harris Jones (a.k.a Mother Jones), Mutual Film Corporation, and Zimmermann Telegram. The articles vary from a paragraph to several pages. At the end of each is a reference to a specific item in the bibliography of sources.

The Modern Encyclopedia of Russian, Soviet and Eurasian History, edited by George N. Ryne (formerly Modern Encyclopedia of Russian and Soviet History; re-titled with vol. 56) is beginning a Supplement (Gulf Breeze, Fla.: Academic International Pr., 1995; vol. 1, A-Type Rockets-Alma-Ata Agreements; in progress) and intends to update and expand the earlier encyclopedia. The Supplement was considered crucial because of the “powerful changes in Soviet institutions ... wrought by the collapse of the Soviet Union in 1991” (Pref.). Much fuller treatment is provided for the history of non-Russian areas and cultures. Each signed article closes with a current bibliography, which can vary from a few references to a page.

IN FORTHCOMING ISSUES OF COLLEGE & RESEARCH LIBRARIES

Analysis of Trends in Demand for Computer-Related Skills for Academic Librarians from 1974 to 1994—Yuan Zhou

Do Instruction Skills Impress Employers?—Chris Avery and Kevin Ketchner

Use of Series Title Authority Cross-References at a Large University Library—Henry H. McCurley Jr. and Elizabeth J. Weisbrod
Letters

To the Editor:

With reference to “Destruction of Knowledge: A Study of Journal Mutilation at a Large University Library” (C&RL 56 [Nov. 1995]: 497–507) by Constantia Constantinou, this may be a naive question. Has any library calculated the “trade-off” between free photocopies and the costs of replacing mutilated materials?

Marvin H. Scilken
Editor
The U*N*A*B*A*S*E*D Librarian
The “How I Run My Library Good” Letter

To the Editor:

As I began to read Constantia Constantinou’s interesting article on journal mutilation, I was shocked by a reference to “Anthony, emperor of Rome” on page 497. Mark Antony (Anthony, Antonius, etc.) was many things, but he was never an emperor. I would not quibble over a phrase such as “would-be emperor,” but “emperor” is the sort of error that discredits its librarians in the eyes of other academics. I am surprised that such a boner got by; it detracts from what is otherwise an interesting article.

Jon M. Suter, Ph.D.
Director of the Library
Houston Baptist University

To the Editor:

I have no quibble with the logical conclusion that Carolyn W. Jardine reaches in “Maybe the 55 Percent Rule Doesn’t Tell the Whole Story” (C&RL 56 [Nov. 1995]: 477–485), namely, that positive behavioral traits will result in greater user satisfaction. But it is important to keep in mind that librarians are not pharmacists: it does not really matter if patrons indicate that they are satisfied if they concomitantly have not achieved their goal, specifically, the acquisition of the material that they seek. Reference personnel are not in the business of providing users with satisfaction. We tender apposite sources, search strategies, data, and information—even to dissatisfied customers.

A simplistic analogy might help here. A man who needs a snow shovel goes to a hardware store. He discovers that because of a recent blizzard the store does not have a single snow shovel in stock. On the way out, he notices that some esoteric grass seed has been reduced from twelve to two dollars a pound. He purchases a large bag (not realizing that the seed will have lost much of its viability by the time planting season arrives). As he heads for his car, an interviewer asks him if he is satisfied. “Indeed I am. I did not get the shovel I need, but I was lucky enough to find this incredibly priced grass seed.” Satisfaction is not necessarily a tenable indicator of success. I am obviously not advocating the purposeful alienation of our clients. I am indicating that in our business satisfaction is a secondary, not a primary, consideration.

Robert Hauptman
Professor
Learning Resources Services
St. Cloud State University

It is easy to imagine the author of this volume as the exasperated, but unflagging coach of a permanently cellar-dwelling football team, shouting by turns encouragement and abuse at his players on the field, patiently explaining to them at half-time the game plan for the umpteenth time, reviewing again and again the old game films, analyzing what went wrong and why—yet all the while never giving up, never losing faith in his team. In this case, the coach is Herbert S. White, immediate past dean of the School of Library and Information Science at Indiana University and one of the best-known and most enduring figures on the library scene. The team he is coaching is the unprepossessing cadre of professional librarians. And the opponents (or “enemies,” as the author is not reluctant to call them) are all the other stakeholders in the information marketplace who value too little what librarians do but expect them to do more of it, and always with less and for less. Fifty-seven essays gleaned from White's speeches and writings between 1982 and 1995 are collected here. They might be called, not completely unfairly, the master's collected pep talks. Although many of his carefully reasoned and insightful analyses of specific issues are included here as well, on topics of note from resource sharing and the explosion of journal costs to personnel evaluation and bibliographic instruction, the dominant tenor of the book is not educational, but exhortative. When White is not quoting Peter Drucker (or himself), he invokes the immortal words of Pogo Possum: “We have met the enemy, and it is us.” We have to come to grips with our own timidity, he is telling us—and then come out swinging.

Most of the essays in this volume have been reprinted with changes from his popular and polemical “White Papers” column in *Library Journal*, a fact that goes far toward explaining the overall tone of the book. However, other articles, which have been culled from White’s work as a teacher and invited lecturer across the country, are published here for the first time. Completely original are the introductions the author has penned for each of the three section headings of this book: “Librarians and Their Role,” “Librarians, Their Self-Image, and the Perceptions That Define Their Preparation,” and “Librarians in the Cruel World of Politics and Money.” These section titles seem contrived, and in no way subsume or even loosely organize the essays they contain. But how could they? It would be impossible to impose any order on these opinion pieces, essays, and analyses which cover the entire gamut of issues in our field. The uninspired title of the volume, standing in awkward contrast to the trendy and thoroughly hackneyed subtitle (*crossroads on a superhighway?*) also is nothing but a capitulation before the enormity of devising a single label for the whole body of eclectic thought of this great library advocate.

But wait: Is Herbert White truly a “library advocate”? He denies it, and rightly so. White is much more a *librarians’* advocate and their grassroots organizer, who sees no hope for the profession unless it asserts itself with the same single-mindedness as the American Association of Retired Persons, the tobacco industry, or the National Rifle Association—examples he explicitly invokes as models.
"We are easily seduced by 'good' causes," he writes, adding that "we are casually pressed into service on behalf of someone else's priorities," while no one, no one at all, looks out for us. This is the "cruel world" he talks about and which he rubs the noses of his readers in at every turn. We are lulled into passivity, he writes, by the "cheap praise" we attract through the "library profession's perceived role as mendicant," although this earns us "very little political leverage or professional respect." He provides stinging examples of our naiveté: In "Bailing Out the Pacific Ocean with a Teaspoon," he recounts that when Hillary Rodham Clinton graced a library conference with her presence and was enthusiastically received, nobody seemed to care that she did not talk about libraries but simply used the platform to recruit our support for her version of health care legislation. We might have offered her a trade by suggesting that in return for our support, she persuade her husband to restore program budgets for libraries. However, we did not. Perhaps librarians would consider such a suggestion rude, but it was political deals that passed NAFTA.

Later on, in "Playing Shell Games without Any Peas," he recalls how educators, our presumed allies, composed A Nation at Risk, "an otherwise superb political document that never acknowledged the existence, let alone the importance and role of libraries" in the national educational enterprise. Our only hope lies in the recognition that our competitors for public (and tax) support are not in the military or the space program but, instead, are the "other social programs, unpleasant and uncomfortable as that realization may be: ... the present competition for funding among 'good' things is ferocious and it should suggest to us an insistence on hard-nosed quid pro quos in building alliances." White is an old-school liberal who believes in libraries but believes that their interests are best served when librarians aggressively represent their own interests, not someone else's and not abstract "good" causes that only serve to distract them from the serious business of survival in a hostile climate. None of this will sound unfamiliar to readers of White's prodigious production of articles and books.

Why, then, purchase this book if most of its contents are easily found in widely held journals amply indexed in Library Literature? Perhaps the greatest single advantage of this compilation is that it brings together White's disparate writings of the past ten to fifteen years, allowing us to study White himself—a worthy subject in his own right—and to compare his thought today with that of his earlier "collected works" volume, entitled (with premature optimism, as the author now recognizes) Librarians and the Awakening from Innocence (Boston: G. K. Hall, 1989).

In the present political climate, White's style of advocacy often seems as dated as its object, the "profession of librarianship" itself. Libraries, and especially library schools, now seek success in the public arena by distancing themselves from traditional notions of libraries and librarianship, not by returning to the core values of the profession that White so vociferously upholds. Depressing comparisons come to mind while reading this book, not with sleek lobbying SWAT teams such as the NRA but, rather, with the moribund interest groups of organized labor. It is a cold, cruel world out there indeed, and White's brand of librian militancy seems overtaken by events and strangely out of synch with the times. Maybe if we had listened to him years ago, it would not have come to this.—Jeffrey Garrett, Northwestern University, Evanston, Illinois.


In "The American Scholar," Ralph Waldo Emerson criticized those who balk at the new and untried, but then he sets out the
dilemma of revolutionary ages, "This time, like all times, is a very good one, if we but know what to do with it." In libraries and in scholarly communication generally, electronic journals hold both the greatest near-term possibility of revolution and also pose the most pressing challenge of deciding just what to do with them. Publishers, libraries, and scholars are responding with a variety of models for the electronic journal; some have already proven to be dead ends, but other new models come along with regularity, driven by economic necessity. These efforts seek answers in three areas: the technical methods of preparing and delivering electronic journals to users; the structural and financial changes in journal publishing; and the acceptance of electronic journals by users, their willingness to use electronic formats and to make them a part of the system of scholarly communication and reward. All are covered in this issue of Library Trends, though the technical and social aspects get fuller and more varied treatment.

The three articles on technical issues are examples of what this collection does best: brief, understandable surveys that prepare librarians to participate in the debate. Thomas Hickey discusses the capabilities and limitations of three journal formats: simple ASCII text, page images, and structured text (SGML). Both Hickey and his OCLC colleague, Stuart Weibel, who writes on Web applications, believe that marked-up text (SGML and its subset HTML) delivered over the Internet is the most likely path for future development, perhaps complemented by page images of older publications. The article by Maynard Brichford and William Maher on archival questions identifies continued access to information as more important than any physical threats to electronic media. The question of access has a financial and contractual aspect as well: if publishers provide data from servers, they must take responsibility for ensuring continued access to those data.

Throughout this collection, there is a realistic and refreshing willingness to concede that many technical problems still exist, but also an optimism that time and money will solve them. There is, however, less certainty about the personal and institutional acceptance of electronic publishing. Kenneth Arnold critically surveys the theories suggesting that electronic information will transform scholarly and other communication, and Laura Gasaway provides a lucid exposition of the current state and possible future of copyright, but the bulk of the essays deal with the acceptance of electronic publishing by individuals, scholarly disciplines, and institutions. Because I have been visiting offices and computer labs on my own campus to evaluate access to electronic information, I was particularly drawn to Ann Bishop's account of her experiences using seven electronic journals, assessing the reader's likely awareness of their existence, ease of access, and ease of use. She supplements this by interviewing engineering faculty and students (and gives a URL for those interested in the continuation of her work). Although her experience was with journals delivered via listserv and gopher, methods that are largely being supplanted by the Web, her approach can serve as a model for the ongoing local surveys that are needed when we make an investment in organizing and delivering electronic information.

Here and in other articles, there is agreement that a reader's acceptance of electronic information will vary greatly from discipline to discipline and individual to individual. Carol Tenopir also asks what is needed for the author to accept electronic publishing. In addition to quicker and more effective distribution of research, academic authors expect that their contributions to electronic publications will receive due consideration when tenure, promotion, and salary decisions are made. Some of the touted speed, communication, and financial advantages of
electronic publication may not be possible if much of the editorial and peer review apparatus must be retained to accommodate the academic reward system. Interestingly, only Arnold mentions in this context the role of the print journal with an electronic version, as, for example, with Project Muse at Johns Hopkins University Press. This seems an attractive transitional vehicle for gaining scholarly acceptance—available over the Internet, but with all the trappings of a traditional journal.

Two articles deal specifically with the acceptance of electronic information in the library. Bryce Allen's article on personality types and organizational attitudes to change is interesting, but his solutions often seem too general. His focus on personality issues neglects institutional politics and priorities in areas such as the relationship between the library and the computing center. Gay Dannelly's article on resource-sharing covers that topic well, but also goes beyond it to deal briefly with some of the core collection development issues such as leasing, access fees, and preservation of the historical record.

This issue of Library Trends is required reading for anyone who is beginning to grapple with electronic journals, electronic information generally, or the changes in scholarly communication. Most of the essays attempt to establish the state of the art and lay out the questions rather than solve the problems, so those who already have experience in the field might want to look only for the areas that still trouble them.

The one major perspective that is missing in the collection is the publisher's. Many in the library community and some in the scholarly community believe that academe must regain control over its product. Lancaster's survey of the priorities of university administrators suggests that the necessary money will not be available in the near future, and it seems probable that we will be dealing with commercial publishers, university presses, and scholarly societies for some time to come. The essay by Donald King and José-Marie Griffiths provides useful data on the costs of paper and electronic journals. Publishing is also discussed in passing elsewhere, but a survey of the ways in which publishers of all kinds are attempting to deal with the issues of electronic information would have been extremely useful.—James Campbell, University of Virginia, Charlottesville, Virginia.


The title of this book will get the attention of those especially concerned with education for the profession—and not only our profession—but the content will not hold it for long. This short text contains no information on actual library school closings and no attempt at a serious analysis of closings. J. D. Willardson of the College of Education at Brigham Young University (BYU) contributes a twelve-page sketch of historical trends and forces in American higher education. Larry Ostler and Therrin C. Dahlin, librarians at BYU and part-time library school instructors (presumably at the now closed BYU library school), contribute sixty pages, briefly discussing the history of library education and the social changes affecting it, the nature of the profession of librarian, the need for strategic planning, and the importance of accreditation for schools and certification for practitioners; and then offer a proposal to revamp the system of library education. Their idea is to introduce an undergraduate degree program that would include information and education on basic library operations and philosophy and would teach skills that would prepare students for paraprofessional work in libraries. After three
years of practical experience, graduates of this bachelor’s degree program might then enter a master’s degree program, perhaps for a duration of two years; and some might even go on to a doctoral program. Although the undergraduate degree program is described as an information studies program, apparently intended not to be narrowly focused on libraries, the only specific content the authors discuss is instruction in cataloging. Courses would focus on practical skills such as bibliographic description and subject analysis. The master’s degree program would, they say, be heavily theoretical. Graduates would become “the leaders in cataloging organizations,” perhaps as administrators or master catalogers. (Nothing is said to suggest any concern for the design or development of computer-based bibliographic systems.)

After this depressingly retrograde scenario, however, there is a sudden and unexpected change of tone. A four-page concluding chapter abruptly suggests that the force of new information technologies will make librarians redefine their work; that the term librarian has become anachronistic; and that what may be needed is a new type of information professional who is expert in the new information technologies and educated in a new sort of professional school of information studies or communication and information systems, which would result from library education joining forces with educators in (unspecified) information and communication fields.

Then come seventy-five pages of appendices, including the Academy of Certified Archivists’ “Role Delineation,” the ALA’s standards for accreditation as revised in 1992 and the official ALA statement on accreditation, and, rather mysteriously, thirty-nine pages from the official announcement of a new Ph.D. program in library and information management at Emporia State University. Why these items are thought worth reprinting in this context is unfathomable, and why anyone should be expected to pay fifty dollars for a short book half of which is devoted to them is a real puzzle. The discussion in the first half is not rewarding enough to justify the cost of the book. It is true that the last few pages of discussion, with their surprise proposal, do perhaps have some value as a social indicator; however, given the tone of the rest of the discussion, it is a real surprise to find that these authors are prepared to give up the title “librarian” and the institution of the graduate library school. It is as if the authors came to a bridge at the end of their story and, perhaps to their own surprise, crossed it. Unfortunately, they got there too late for their book to be of interest to the rest of us. However, the fact that they could cross that bridge suggests that many others may be prepared to do likewise.—Patrick Wilson, University of California, Berkeley.


Many books on library issues these days are obsolete before they appear in print. It is a pleasure to report on two books that will have a longer shelf life. The first is a collection of historical essays honoring the centennial of the University of Illinois Graduate School of Library and Information Science. The second is the published proceedings of an international conference at Radcliffe College in June 1994 sponsored by the Schlesinger Library on the History of Women in America, which
featured more than 100 speakers from around the world. One book deals primarily with women as librarians in early twentieth-century America, the other with libraries and resource centers for women today.

The authors of the three articles in *Women's Work* are library historians with a deep knowledge of the history and literature of librarianship in America. Laurel Grotzinger has published frequently on early women librarians, especially Katharine Lucinda Sharp, who founded the Illinois State Library School in 1897 and served as its director until 1907. In her article "Invisible, Indestructible Network: Women and the Diffusion of Librarianship at the Turn of the Century," Grotzinger ably exploits primary sources such as letters and alumni files to trace a women's network that encompassed library schools, summer schools, state library commissions, publishing, and professional and social organizations. In his long, leisurely article "Southerners in the North and Northerners in the South: The Impact of the Library School of the University of Illinois on Southern Librarianship," James V. Carmichael Jr. provides a history of cultural confrontation in the '20s and '30s, touching on themes of regional identity, race, gender, and politics. Mary Niles Maack, in "Women As Visionaries, Mentors, and Agents of Change," outlines the dismal regression of women library school faculty from the age of "missionaries and mentors" (1887-1923) through a transitional period of professionalization that began to exclude women (1923-1950) to the era of the masculine professoriate (1951-present). The second half of Maack's rather tendentious article presents research on mentoring of women faculty in library schools today, concluding with remarks on the benefits of mentoring and the influence of the feminine "ethic of caring" on library service.

These studies give texture and color to an age (actually more than one generation) when women librarians were a powerful, driving force in an unstoppable social movement. (Katharine Sharp "considered the library as second only to the church in its ability to do good.") It is particularly gratifying to see library history move from hagiography toward social history, where it can make a real contribution to understanding the Progressive Era. Thanks go to the archives that preserved the records that make this history possible, but regrets also are in order because we do not have enough information on the private lives of these women to explore fully issues such as sexuality, ethnicity, and class.

Another kind of missionary zeal characterizes *Women, Information, and the Future*: to empower women by organizing and disseminating information on legal rights, health, employment, politics, and the environment. These forty-six papers, mostly documentary and descriptive, only dimly reflect the enthusiasm that must have reigned at the conference itself, whose delegates were gearing up for the 1995 Beijing conference on women. Although tedious to read at one stretch, the book is highly recommended as a reference for specific information on women's resource centers such as the Fawcett Library in London, Anveshi Centre in India, Centro Flora Tristan in Peru, Asian-Pacific Resource Centre in Malaysia, and many more. Most of these centers were started during the "second wave" of feminism in the 1970s. They gained support through NGOs (nongovernmental organizations) and international organizations such as the United Nations, which sponsored the Decade for Women (1976-85). A crucial step was the incorporation of women's rights into human rights documents.

The issue of separatism crops up again and again in these papers. Should women's information services and collections be mainstreamed or set apart? Do women need classification systems and thesauri of their own? An acute problem in many regions is to find the best me-
medium and language for communicating with women, many of whom are illiterate or know only local languages. Another broad area of concern is the production of information about women. Standard statistics often omit, or at least mask, women's economic roles, which consequently are ignored in economic planning in developing countries. A more fundamental problem is that women often do not document or record their activities, making their lives invisible historically.

Each of these books encapsulates the spirit of an age, while suggesting some abiding themes in the relationship between women and libraries. The theme of gender itself is explored only partially and obliquely. A related theme is faith in progress, which may no longer prevail in American librarianship or even in the American woman's movement, but is alive and well in women's struggles elsewhere in the world. Perhaps the theme—or rather the image—that unites the two books most strikingly is that of a network. The difference between the old-fashioned social network of personal and professional relationships and modern regional and global networks is one of technology and scope, but not function. What emerges clearly is the idea that information confers power, and power is a good thing for women to have. Although few early American women librarians identified with the woman's movement, they exemplified it in their lives.—Jean Alexander, Northwestern University, Evanston, Illinois.
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