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VOLUME 52
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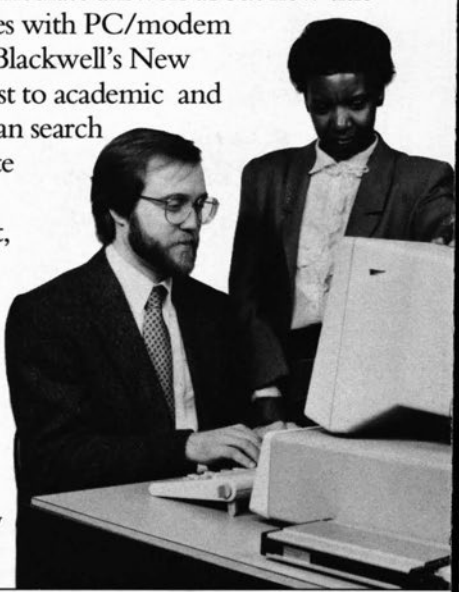

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Guest Editorial

Paraprofessionals: Shaping the New Reality

Until quite recently, the role, status, and working conditions of paraprofessionals have not been topics of intense or generalized interest within the profession. That librarians have remained aloof from the day-to-day needs and concerns of their uncredentialed coworkers is a truism reflected in our experience, our literature, and the activities of our professional associations. Although an intense process of "off-loading"[1] tasks, once characteristically performed by librarians, onto support staff has occurred over the past twenty or so years, the effects of this process have been largely ignored and stand in need of analysis.

Increasingly preoccupied with their newfound faculty status obligations of governance, teaching, and research, academic librarians began assigning to support staff tasks they could no longer accommodate or considered repetitive. These assignments included stints at that once sacrosanct preserve of the true professional, the reference desk. Today, newly anointed paraprofessionals search remote databases, perform original as well as copy cataloging, select books, and assume administrative responsibility for a variety of functional areas. Although we largely ignored the effects of these changes, the process created a class of authentic paraprofessionals.

Several forces have driven downward many of the duties formerly considered fully professional; for example, the intense application of technology to library processes, severe budget constraints, and the relative success achieved by librarians in their quest for a higher status. These factors have resulted in significant task overlap between librarians and support staff and in an acute identity crisis for the profession.

Task overlap causes the role blurring that characterizes the academic library workplace today. It also inhibits our ability to describe satisfactorily either group. Role blurring profoundly angers paraprofessionals who perceive themselves as doing the work of librarians for less money and an inferior status. They also resent being labeled nonprofessional. Even an act as apparently simple as assigning generic or position titles to paraprofessionals risks creating shock waves. Nomenclature, Kathleen Heim suggests, is "symptomatic of deeper and more complex problems."[2]

Role blurring confuses our clientele. It is hardly surprising that teaching faculty, students, administrators, and others fail to distinguish between librarians and support staff. A recent study of faculty attitudes towards librarians concludes that such misperceptions diminish the quality of patron-library contacts, isolate the library within the organization, and depress the salaries and status of librarians and paraprofessionals alike.[3]

In general, paraprofessionals have good reason to be concerned about their condition. My as yet unpublished research demonstrates that we often fail to provide them with systematic continuing education opportunities, for example, funding for attendance at national workshops and conferences; limiting their involvement in our associations and in library policy formulation, planning, and decision-making processes; excluding them from the collegial process and; at least in the smaller libraries, failing to provide them

with ranked classification systems to compensate for the rigid hierarchical structures within which they are required to function.

In her final recommendations as Executive Director of the Association of College and Research Libraries, JoAn Segal suggests that now "is the time to open membership [in the ACRL] to paraprofessionals," a move she expects "would strengthen relations in the workplace, serve as a recruitment tool for entry into the professional ranks, and indicate our willingness to provide educational and other opportunities."[4] Other recent signs of interest in the condition of paraprofessionals include a new journal devoted to support staff issues,[5] an increase in the number of research-based articles on paraprofessionals, and the growth of paraprofessional sections within state and regional library associations.

Much more needs to be done. We must incorporate paraprofessional concerns into our strategic planning and national research agenda. A few of the topics that cry out for attention include:

- occupational segregation, pay equity, and comparable worth,
- role blurring and role definition,
- job satisfaction,
- education, utilization, and entry requirements,
- deliberate task and salary overlap,
- similar issues in other professions, and
- the effects of deprofessionalization.

Of course, individual librarians neither can nor should expect to resolve all of these issues immediately. We must begin, however, by abandoning our traditionally patronizing attitudes towards paraprofessionals and accept them as colleagues. As for paraprofessionals, they must take charge of their own destinies through renewed dedication to the profession and intensified organization, participation, and education.

That the problems besetting paraprofessionals mirror those confronting librarians is an irony that is not lost. Both librarians and paraprofessionals recognize and accept the symbiotic nature of their relationship. In the final analysis, however, we librarians may fail to resolve our own long-standing identity problems if we are unwilling or unable to help paraprofessionals resolve theirs. Meanwhile, it is encouraging to note that we are no longer ignoring the legitimate concerns of the majority of all library workers.

LARRY R. OBERG, ALBION COLLEGE

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Collection Growth and Expenditures in Academic Libraries: A Preliminary Inquiry

Richard Hume Werking

These data, from a group of liberal arts college libraries as well as from the much more scrutinized ARL libraries, raise important questions about certain articles of faith in academic librarianship. These questions relate to: the "doubling time" of library collections; the "60-30-10" division of library expenditures; the growing robustness of materials expenditures as a percentage of total expenditures, especially among the college libraries; and the phenomenon of increases in total expenditures considerably exceeding increases in major price indexes.

"That most librarians dislike statistical records is patent. But without figures capable of intelligent interpretation, we are seriously handicapped indeed. William Thomas Kelvin expressed the need adequately and succinctly, '. . . when you can measure whatever you are talking about, and express it in numbers, you know something about it.' "
—Lawrence S. Thompson, 1945.

"It is essential that more be known about the present use and management of library budgets."—Warren J. Haas, 1986.[1]

Generalizations about academic libraries in the United States are frequently based on data from or experiences in those libraries which are members of the Association of Research Libraries. In order to examine data related to collection growth, expenditures, and automation, I wanted to give my attention to another group of libraries which have collected and shared data for more than twenty years. These are the schools on the so-called "Bowdoin List" of liberal arts college libraries, a group taking its name from the institution whose library director has compiled the statistics since 1967. Examining data and trends among these college libraries should be useful not only in itself, but also in carefully generalizing about other groups of academic libraries, and in comparing trends with the ARL libraries. In time, perhaps, other researchers will study other groups of academic libraries. These studies will lessen our dependence on the *ARL Statistics* for generalizing about aspects of academic librarianship.

This article is divided into several parts. Sections I through V present the statistical data from the Bowdoin List libraries and compare them with ARL data, both to illustrate and to serve as the basis for discussing significant trends in two important sectors of academic librarianship. Section I covers collection growth, while Sections II through V examine data related to various categories of expenditures, both for the ARL and the college libraries. A subsequent article will report on the state of automation among this group of college libraries.

THE BOWDOIN LIST LIBRARIES

From 1943 until 1960, the Association of College and Research Libraries published library statistics for colleges and universities. The statistics for 1958/59, published in 1960, comprised the last such compilation because ACRL turned the task over to the federal government

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and the HEGIS reports.[2] Soon afterwards, in 1962, the Association of Research Libraries began the annual publication of its members' statistics, and five years later a group of college libraries began to share their statistics with one another.[3]

In 1967, Richard Harwell, Librarian at Bowdoin College in Brunswick, Maine, prepared a list of thirty-seven college libraries from which he solicited annual statistics to compile and share with the contributors. The first Bowdoin List of library statistics covered the 1966/67 academic year.[4] It has since been continued annually, with Arthur Monke assuming responsibility for its compilation after he succeeded Harwell as director at Bowdoin. Over the years the list grew to include forty-two institutions (see figure 1).

The colleges on the Bowdoin List are widely recognized as among the most prestigious liberal arts colleges in the country. They are all private institutions, are primarily undergraduate, exercise a high degree of selectivity in admissions, and are nonsectarian. They are also relatively small; in the first year of the Bowdoin List, enrollments ranged from 1,865 at the largest school to 842 at the smallest, with a median of 1,267. Twenty years later the range was between 3,453 (for Bucknell, which had not been on the list at the outset) and 479, with a median of 1,532. As one director commented to me, "It is not an objectively determined list, but it is a very useful list, convincing to administrators and faculty."

Thus, the Bowdoin List college libraries constitute a fairly homogeneous, self-identified group. No attempt is made here to claim that they are "typical" academic or college libraries. Studies of groups of libraries in addition to those which are members of the Association of Research Libraries, the Bowdoin List, and the relatively new "ACRL University Libraries" list would likely give us a fuller understanding of the various sectors in academic librarianship.

Amherst*
Antioch
Bates
Beloit*
Bowdoin*
Bryn Mawr
Bucknell*
Carleton*
Colby*
Colgate*
Connecticut*
Davidson*
Dickinson
Earlham*
Franklin & Marshall*
Grinnell*
Hamilton*
Haverford*
Hollins
Knox
Lafayette*
Lawrence*
Macalester*
Middlebury*
Mills*
Mount Holyoke*
Oberlin*
Occidental*
Randolph-Macon*
Reed*
Smith*
Swarthmore*
Trinity (Connecticut)*
Union*
University of the South*
Vassar*
Wabash*
Washington & Lee
Wellesley*
Wesleyan*
Wheaton*
Williams*

*Indicates a response to the survey.

FIGURE 1
The Bowdoin List Institutions

METHODOLOGIES

After securing a complete set of the Bowdoin List data since 1966/67, a data sheet was prepared for each library, filling in for each the collection size, expenditures for salaries and wages, for materials, total expenditures, "other"

expenditures (the total less the sum of salaries/wages and materials), and for size of staff.[5] A questionnaire was also prepared to elicit any additions or corrections to the data (a substantial amount of each was received), as well as information concerning: how various expenditure categories were reported; the status of automation or plans for automation; how automation was being financed; and how the directors felt about the shifts in categories of expenditures.[6]

After the survey was "piloted" with several library directors and other individuals, it was sent to the directors of the forty-two Bowdoin List libraries. Thirty-five were returned, for a response rate of 83%.

In addition to the survey, I received a considerable amount of information during personal interviews of library directors at twenty-two of the colleges. It is evidence of their willingness to be helpful, and perhaps to some extent of their interest in the project, that not a single director declined to be interviewed or was unavailable because of scheduling conflicts.

To describe statistically the "typical" library for any given variable (rate of collection growth, materials expenditures as a proportion of the total, etc.), the median, that point on an arrayed scale where half the observations fall above it and half below, was chosen as the measure of central tendency. This has been the method used by the Association of Research Libraries for many years. The median was also supplemented with the "interquartile ranges," those points which lie halfway in each direction between the median and the farthest observation. Hence, readers can quickly determine the values which incorporate three-fourths of the observations, from an (unknown) end point value through the value expressed by the quartile on the opposite side of the median.

Because it was desirable to include the 1960s within the coverage of this study and because neither the Bowdoin List nor the *ARL Statistics* existed at the beginning of that decade, other sources of information had to be consulted in order to capture the data for 1960/61. For the colleges, I relied on the *American Library Directory, 1962* and obtained data for thirty-three of the forty-two Bowdoin List college libraries in 1960/61.[7] In that same volume, five other colleges on the list reported data for 1959/60 and four for 1961/62; these were not used. For information about collection size among the research libraries, a list of the forty-two largest university libraries in the country was used, compiled by staff at Princeton University and entitled "Statistics for College and University Libraries for the Fiscal Year 1960/61."[8] Because total library expenditures were not provided in the Princeton statistics, this article contains no 1960/61 financial data for the forty-two research libraries.

George Piternick's sensible observation is worth repeating: 'Statistical inference always involves risk; it is essential, therefore, that any inference be made with much care and some humility.'

A CAUTIONARY NOTE ABOUT LIBRARY STATISTICS

Library statistics can be misleading and need to be approached cautiously. Those used in this article are certainly no exception. George Piternick's sensible observation is worth repeating: "Statistical inference always involves risk; it is essential, therefore, that any inferences be made with much care and some humility."[9]

One problem with statistics is the likelihood of errors, ranging from minor and occasional to major and frequent. These can occur at the time of the initial counting, or when first recording the count, or when the number is transcribed at any of several stages, including the final compilation within the library or the compilation by the organization or individual issuing the statistics for a group of libraries. For example, in one edition of

the *ARL Statistics* a library's expenditures are recorded as follows: $738,188 for materials and binding; $1,088,292 for salaries and wages; $34,819 for other operating expenditures; and total expenditures of $1,123,101.[10] It is clear that an error was made somewhere. When errors are noticed subsequent to publication, errata sheets are sometimes issued.

In addition to errors is the more subtle issue of definitions and categories, over space and over time. Within a group of libraries there will be, at least initially, different opinions about what items should be included in a given category. For instance, in reporting the number of volumes held, should the figure be the bibliographic or the physical count? Should the total reflect just the number of books and bound periodicals, or should it also cover government documents, microform pieces or volume equivalents, or other formats? Should the figure for total expenditures include fringe benefits (which appear on the library's budget sheets at some institutions but not at others)? If so, should the fringe benefits be included as a portion of the reported expenditures for salaries and wages? Not only will these practices of recording and reporting data vary somewhat between libraries, but over a period of time they may well vary even at the same library, either with changes in administrators or with the same administrator deciding (or complying with the request of the extramural compiler) to report the figures differently.

The college library statistics, like their well-studied ARL counterparts, do reflect some differences of definition. The data from several of the libraries over time have shown considerable fluctuations in the numbers of volumes reported. These fluctuations reflect, at least in part, not only weeding (a practice rarely found to a significant degree in research libraries) but also redefinition of what to include in the volume count. Moreover, of the thirty-four library directors responding to a question about reporting fringe benefits, seventeen do not presently include fringes in total expenditures. Of those seventeen who do, seven report them as part of the salaries and wages expenditures (thereby obtaining a larger percentage for that category of expenditure and a smaller percentage for "other"). There are also significant differences between institutions in terms of what benefits they offer. The important point to make, however, is that few of the libraries appear to have changed the way they handled fringe benefits or student wages between 1967 and 1987. Hence, it is doubtful that such changes have had much impact on the trends described in this article. Beginning with the 1987/88 compilation, however, the Bowdoin List library directors were asked by the compiler of the statistics to include their student wages as a portion of their regular salaries and wages, with the result that salaries/wages as a proportion of total expenditures rose from a median of 42.5% in 1986/87 to 44% in 1987/88, while the "other" category declined from 18% to 17.5%. Materials remained unchanged at 38%.

One change I made involved the number of staff reported for the ARL libraries for some of the years. Before 1974/75, the ARL statistics for staff excluded student workers; in that year they were included and have continued to be. The Bowdoin List data have always excluded student workers from the staff count, capturing their contribution in an "hours of student assistance" category. Hence, for the earlier years of the ARL statistics, FTE student workers were added to the staff figures, resulting in an adjusted figure that makes those years comparable with later ones.[11]

A common problem in analyzing data from a group of institutions over a period of time is that in one year some institutions are included and in another year they are not. The result is that, in effect, one is comparing different groups of institutions. Thus for each of the tables in this report, data for an institution are included only if that institution's data are also included for each of the years being compared in that table. Consequently, I am not including any library that joined ARL after 1967, which can have an im-

pact on the results one obtains and perhaps on the conclusions one reaches. For example, the median total expenditures figure for sixty-eight ARL libraries grew by 463% between 1967 and 1987. When the 1967 median expenditure is compared to the median expenditure of all 106 ARL libraries in 1987, the increase is only 377%. There were seventy ARL libraries in 1967, sixty-nine of which have retained that status.

I. COLLECTION GROWTH

It has been forty-six years since the appearance of Fremont Rider's *The Scholar and the Future of the Research Library,* in which the author observed that research libraries seem to double every sixteen years or so. Rider's thesis has enjoyed a durable and tenacious credibility; as recently as 1985 Warren Seibert referred to Rider's "near-venerable findings."[12]

Alabama	Nebraska*
Arizona	New York/Buffalo
Boston U.	New York University*
British Columbia	North Carolina*
Brown*	Northwestern*
California/Berkeley*	Notre Dame
California/Los Angeles*	Ohio State*
Chicago*	Oklahoma University
Cincinnati*	Oregon
Colorado*	Pennsylvania State
Columbia*	Pennsylvania University*
Connecticut	Pittsburgh
Cornell*	Princeton*
Duke*	Purdue*
Florida State	Rochester*
Florida University*	Rutgers*
Georgetown	St. Louis University
Georgia	Southern California
Harvard*	Southern Illinois
Illinois*	Stanford*
Indiana*	Syracuse
Iowa State*	Temple
Iowa University*	Tennessee
Johns Hopkins*	Texas A&M
Joint University*	Texas University*
Kansas*	Toronto
Kentucky*	Tulane
Louisiana State*	Utah
Maryland	Virginia*
M.I.T.*	Washington State
McGill	Washington University, Missouri*
Michigan State*	University of Washington*
Michigan University*	Wayne State
Minnesota*	Wisconsin*
Missouri*	Yale*

*Indicates inclusion on the 1960/61 list.

FIGURE 2
The ARL Institutions in 1966/67

Although virtually all of the subsequent literature on collection growth has focused on the larger university libraries, Rider himself was not so limiting, notwithstanding his book's title. In the book, the first table records collection growth in ten American men's college libraries (including Wesleyan, Amherst, and Bowdoin), while the second provides similar information for five libraries at American women's colleges (Smith, Vassar, Wellesley, Bryn Mawr, and Mt. Holyoke); thirteen of these fifteen are today Bowdoin List libraries. And just several pages later the author stated categorically: "In fact, this may be asserted as almost axiomatic: unless a college or university is willing to be stagnant, unless it is willing *not* to maintain its place in the steady flow of educational development, it *has* to double its library in size every sixteen years, or thereabouts."[13] By this exacting standard, a number of institutions have fallen short.

"Unless a college or university is willing to be stagnant, unless it is willing *not* to maintain its place in the steady flow of educational development, it *has* to double its library size every sixteen years."

Data on collection growth between 1967 and 1987 were obtained for thirty-eight of the Bowdoin List libraries, by taking those data from the annual compilations and also by receiving additions and corrections from many of the thirty-five directors who responded to the survey. These libraries ranged in size in 1967 from 636,437 volumes for the largest to 92,892 for the smallest; by 1987, the figures were 996,222 and 151,989 respectively. Table 1 provides a summary of the size of collections.[14]

In the twenty years between 1967 and 1987, ten of the thirty-eight college libraries doubled or more than doubled the size of their collections (including the library whose collection grew by 99%). As shown below, the median of the increase in collection size over the twenty-year period was 74.5%. For the first of the two decades, the growth was slightly greater than in the second, with median percentage increases of 33.5% and 30% respectively. Table 2 summarizes the data.

Calculating from the beginning of the 1960s adds considerably to the number of college libraries which at least doubled the size of their collections by 1987. If two libraries that increased by 98%

TABLE 1
NUMBER OF VOLUMES, 1967 TO 1987,
THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	317,342	417,920	530,327
Median	222,051	309,299	395,021
Q_1	173,172	231,017	309,115

TABLE 2
PERCENTAGE INCREASES IN NUMBER OF VOLUMES 1967 TO 1987,
THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	49.5	35	97
Median	33.5	30	74.5
Q_1	26	18	54.5

Note: For this and subsequent tables showing percentage increases, the procedures followed were the same: calculating the percentage increase for each library for the indicated period; arraying the percentages in descending order for each period; identifying the median of the array, and the third and first quartiles. When a mid-point falls between two data points, the value is reported as the average of those two points. By comparison, the median collection size, as opposed to the median percentage of growth, rose by 78% over the twenty years, 30% in the first decade and 28% in the second.

and 99% are counted, there are twenty-one of them, or about two-thirds. (Data for six of the thirty-eight libraries described in tables 1 and 2 were not available for 1960/61.) (See table 3.)

Naturally, research libraries add many more volumes each year than do college libraries. As shown by these data, their collections also have tended to grow at a more rapid rate. This result is, or course, more difficult with a larger number of volumes on hand at the beginning of the measurement period. (As one college library director stated, "Of course we doubled in size over that period of time; we didn't have very much to start with.") Of sixty-nine ARL libraries, thirty-six grew by 100% or more between 1967 and 1987, while thirty-three did not. Tables 4 and 5 provide summaries.

Naturally, research libraries add many more volumes each year than do college libraries.

The increase between 1967 and 1977 was considerably greater than in the subsequent decade.

Going back to 1960/61, and to a smaller group of the forty-two largest research libraries, all but five of them doubled the size of their collections by 1986/87; of those five, Harvard grew by 65%, Yale by 87% and the other three by between 91% and 95% (see table 6).

It is worth noting that the collections of the ten college libraries which at least doubled between 1967 and 1987 (about one-fourth) grew at a faster rate than thirty-three of the research libraries (about half) during the same period. For 1961 to 1987, the ten fastest-growing college library collections (about one-third) increased faster than twenty of the research library collections (about half).[15]

II. "OTHER" EXPENDITURES

Library expenditures have for many years been divided into three general categories: materials (traditionally—books, periodicals and other serials, usually binding, and often "other mate-

TABLE 3
NUMBER OF VOLUMES, 1961, AND PERCENTAGE INCREASES IN NUMBER OF VOLUMES, 1961 TO 1987, THIRTY-TWO COLLEGE LIBRARIES

	Vols 1961	% Incr. 1961-67	% Incr. 1967-77	% Incr. 1977-87	% Incr. 1967-87	% Incr. 1961-87
Q_3	258,556	41	46	34	93	165
Median	184,500	22.5	32.5	28.5	73.5	124
Q_1	134,160	15	25	19	54	82

TABLE 4
NUMBER OF VOLUMES, 1967 TO 1987, SIXTY-NINE ARL LIBRARIES

	1966-67	1976-77	1986-87
Q_3	1,863,233	2,910,461	3,881,945
Median	1,213,855	1,852,841	2,484,152
Q_1	982,860	1,446,011	1,950,400

TABLE 5
PERCENTAGE INCREASES IN NUMBER OF VOLUMES 1967 TO 1987, SIXTY-NINE ARL LIBRARIES

	1967-77	1977-87	1967-87
Q_3	68	42	125
Median	52	32	102
Q_1	33	25	69

TABLE 6
NUMBER OF VOLUMES, 1961, AND PERCENTAGE INCREASES IN NUMBER OF VOLUMES, 1961 TO 1987, FORTY-TWO RESEARCH LIBRARIES

	Vols 1961	% Incr. 1961–67	% Incr. 1967–77	% Incr. 1977–87	% Incr. 1967–87	% Incr. 1961–87
Q_3	1,652,521	40	56	38	110	191.5
Median	1,113,122	32.5	48	27.5	88.5	161.5
Q_1	911,248	25	32.5	24	66	120

rials''), salaries and wages, and ''other'' (everything else). Conventional wisdom has been that the normal division among the three categories was ''60-30-10'': 60% for salaries and wages; 30% for materials; and 10% for ''other.''[16] This third aggregation has long been a catch-all for supplies of various kinds, noncapital equipment and equipment maintenance, telephone charges, travel expenses, interlibrary loan charges, and the like. More recently it has (usually) included monies for payment to bibliographic utilities. Because many libraries report their fringe benefits and student wages expenditures but do not include them under the ''salaries and wages'' category, these therefore become, *de facto*, part of the ''other'' category of expenses.

Still, the smallest of the three categories, ''other'' expenditures in the Bowdoin List colleges in 1986/87, ranged from a high of $623,670 (and 29% of total expenditures) to a low of $38,079 (and 7%). Not surprisingly, perhaps, this is the category which over the last two decades has experienced the largest relative growth, as shown in table 7. In 1966/67 the median college library spent 8% of its budget on costs other than salaries and wages or materials; twenty years later, it was spending 18%.

A subset of this group of the college libraries for which there are 1960/61 data demonstrates the same overall trend (see table 8).

As shown in table 9, the research libraries display this same general trend, rising from a median expenditure of 6% for ''other'' in 1966/67 to 13% in 1986/87. Because of differences between the two groups of libraries in terms of what is included in which expenditure categories, readers should be very cautious about comparing this 13% figure with the 18% figure for the median college library. What is significant, and common to both groups, is the growth of ''other'' as a proportion of the total.

(Because the 1960/61 data for the research libraries did not include data on ''total expenditures,'' this article does not provide a second table covering these forty-two libraries in the several sections dealing with expenditures).

If significantly larger portions of library expenditures are going to ''other,'' they must be coming from one or both of the remaining two budget categories. The chief contributor, and the only one in the case of the college libraries, has been the salaries and wages category.

III. SALARIES AND WAGES

Although still the largest of the three categories, salaries and wages have declined sharply as a percentage of total ex-

TABLE 7
PERCENTAGE OF TOTAL EXPENDITURES DEVOTED TO ''OTHER,'' 1967 TO 1987, THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	11	17.5	21.5
Median	8	14	18
Q_1	4.5	9	11.5

TABLE 8
PERCENTAGE OF TOTAL EXPENDITURES DEVOTED TO "OTHER," 1961 TO 1987, TWENTY-EIGHT COLLEGE LIBRARIES

	1960–61	1966–67	1976–77	1986–87
Q_3	13	13	18	22
Median	9	8	15	18
Q_1	6	6	9	12

TABLE 9
PERCENTAGE OF TOTAL EXPENDITURES DEVOTED TO "OTHER," 1967 TO 1987, SIXTY-SEVEN ARL LIBRARIES

	1966–67	1976–77	1986–87
Q_3	8	10	17
Median	6	8	13
Q_1	5	6	11

penditures. Between 1967 and 1987, among the Bowdoin List libraries the median expenditure for salaries and wages fell from 55% to 42.5%, as shown in table 10.

Data from the Bowdoin List subset, which includes 1960/61, indicate that for the colleges this trend began earlier. In fact, the median library in this group matched exactly the 60% funding level for salaries and wages found in the 60-30-10 guideline, as shown in table 11.

The picture for the ARL libraries likewise shows a decline in the salaries and wages percentage since the 1960s, but not nearly so great a decline, and one which occurred only after an increase between the mid-1960s and the mid-70s. Table 12 summarizes the data.

Although by 1987 both the research libraries and the college libraries were spending a smaller proportion (and for the colleges a significantly smaller proportion) of their budgets on salaries and wages, they were not spending those dollars on fewer people. Both sets of libraries experienced growth in the number of employees over the course of these twenty years, the median college library by 25% and the median ARL library by some 37%. Consequently, although the numbers of staff in ARL libraries are much larger than in the college libraries, the rate of increase in the ARL libraries has still been 50% greater than that in the colleges. At the same time, the percentage increase in the number of librarians has been greater among the college libraries (see table 13).

TABLE 10
SALARIES AND WAGES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1967 TO 1987, THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	60.5	51.5	49.5
Median	55.5	47	42.5
Q_1	51	44	38

TABLE 11
SALARIES AND WAGES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1961 TO 1987, TWENTY-EIGHT COLLEGE LIBRARIES

	1960–61	1966–67	1976–77	1986–87
Q_3	64	60	51	48
Median	60	55.5	46	43
Q_1	51	50	44	38

IV. MATERIALS EXPENDITURES

Thus far, for the "other" and the "salaries/wages" categories, both the college and the ARL libraries have exhibited the same general trends (albeit to varying degrees)--an increase in the first and a decline in the second. It is in the case of the third category, materials expenditures, that they part company. For

TABLE 12
SALARIES AND WAGES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1967 TO 1987, SIXTY-EIGHT ARL LIBRARIES

	1966–67	1976–77	1986–87
Q_3	60	63	54
Median	55	58	51
Q_1	52	53	47

TABLE 13
NUMBER OF STAFF, 1967 TO 1987, THIRTY-FIVE COLLEGE LIBRARIES

	1966–67		1976–77		1986–87	
	Libns.	Total	Libns.	Total	Libns.	Total
Q_3	9.8	23.4	10	25.6	11.8	32.5
Median	7	17.5	8	22	10	23.7
Q_1	5	11.5	5.9	12.9	6.4	17.3

Note: Numbers are for full-time equivalent staff. Data for the colleges do not include student workers. Because there are data for only sixteen of the college libraries for 1960–61 and each of the other years reported in these tables, no attempt is made to compare college library staffing in 1960–61 with subsequent years.

TABLE 14
PERCENTAGE INCREASES IN STAFF 1967 TO 1987, THIRTY-FIVE COLLEGE LIBRARIES

	1967–77		1977–87		1967–87	
	Libns.	Total	Libns.	Total	Libns.	Total
Q_3	41.5	38	27.5	23.5	71	70.5
Median	13	20	15	9	40	25
Q_1	−2	5.5	0	1	5.5	7.5

TABLE 15
NUMBER OF STAFF, 1967 TO 1987, SIXTY-FIVE ARL LIBRARIES

	1966–67		1976–77		1986–87	
	Libns.	Total	Libns.	Total	Libns.	Total
Q_3	85	312	104	406	113	428
Median	64	213	73	262	87	321
Q_1	44	167	54	205	61	255

Note: Numbers are for full-time equivalent staff. Data for the research libraries include student workers, calculated at 1,800 hours per year equalling one full-time staff member. See *ARL Statistics* for 1966–67.

TABLE 16
PERCENTAGE INCREASES IN STAFF 1967 TO 1987, SIXTY-FIVE ARL LIBRARIES

	1967–77		1977–87		1967–87	
	Libns.	Total	Libns.	Total	Libns.	Total
Q_3	42	45	28	28	56	72
Median	13	19	10	14	30	37
Q_1	0	9	−2	4	7	22

the colleges, the increase in the "other" category as a proportion of expenditures has come entirely from the reduction in the salaries/wages portion. Indeed, the materials expenditures portion has even increased over the years, as seen in table 17. (The median amount expended for materials was $31,000 in 1960/61; $69,000 in 1966/67; $189,000 in 1976/77; and $520,000 in 1986/87—all rounded to the nearest thousand.)(See table 18.)

The subset of college libraries with 1960/61 data shows the median library with materials expenditures accounting for 30.5% of the total in that year. When taken together with the information from tables 8 and 11, the median library in each of the three groups shows 60% going toward salaries/wages, 30.5% for materials, and 9% for other, conforming almost exactly to the time-honored 60-30-10 breakdown.

The research libraries, on the other hand, show a decline over the years, with only a partial recovery between 1977 and 1987, as table 19 demonstrates.

Another way of looking at the growth of materials expenditures for the three sets of libraries is to compare it with increases in the prices of books and periodicals. Tables 20, 21 and 22 provide such a comparison.[18] They show that despite the concern expressed in recent years about the soaring prices of library books and periodicals, the prices of books and periodicals published in the United States grew much more rapidly between 1967 and 1977 than during the ensuing decade. Moreover, for the most part, the materials expenditures of these college libraries kept pace with those price increases although they certainly fell behind the proliferation of book and journal publishing. Typically, these colleges spend a considerably larger proportion of their materials budgets on books than on journals.[19] The typical research library spends over half its mate-

TABLE 17
MATERIALS EXPENDITURES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1967 TO 1987, THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	40	42	43
Median	35.5	38	38
Q_1	31	35	35.5

Note: All the data pertaining to "materials expenditures" reflect the inclusion of binding expenditures, which is the traditional approach. It is the one still used among the Bowdoin List libraries and was used for the research libraries until the 1985–86 *ARL Statistics*. They do not include the category of "Miscellaneous Materials Expenditures," dollars for which in fact go not for materials, but instead for "expenditures for bibliographic utilities, literature searching, security devices, memberships for the purposes of publications, etc." (See *ARL Statistics*)17.

TABLE 18
MATERIALS EXPENDITURES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1961 TO 1987, TWENTY-EIGHT COLLEGE LIBRARIES

	1960–61	1966–67	1976–77	1986–87
Q_3	36	41	42	43
Median	30.5	34.5	37.5	38
Q_1	28	31	33	36

TABLE 19
MATERIALS EXPENDITURES AS A PERCENTAGE OF TOTAL EXPENDITURES, 1967 TO 1987, SIXTY-EIGHT ARL LIBRARIES

	1966–67	1976–77	1986–87
Q_3	41	37	38
Median	38.5	32	34
Q_1	34	29	30

TABLE 20
PERCENTAGE INCREASES IN MATERIALS EXPENDITURES 1967 TO 1987, THIRTY-EIGHT COLLEGE LIBRARIES

	1967–77	1977–87	1967–87
Q_3	213	187	719
Median	152.5	148	518.5
Q_1	96	112	390
U.S. Book Prices	130	86	325
U.S. Periodical Prices	207	190	790

TABLE 21
PERCENTAGE INCREASES IN MATERIALS EXPENDITURES 1961 TO 1987, THIRTY-THREE COLLEGE LIBRARIES

	1961–67	1967–77	1977–87	1961–87
Q_3	158	215	182	1,828
Median	119	155	147	1,399
Q_1	74	91	118	1,019
U.S. Book Prices	44	130	86	513
U.S. Periodical Prices	42	207	190	1,168

TABLE 22
PERCENTAGE INCREASES IN MATERIALS EXPENDITURES 1967 TO 1987, SIXTY-EIGHT ARL LIBRARIES

	1967–77	1977–87	1967–87
Q_3	149	185	519
Median	104.5	160.5	406
Q_1	64	115	321
U.S. Book Prices	130	86	325
U.S. Periodical Prices	207	190	790

rials budget on journals.

For the twenty-year period and the 1967–77 decade, materials expenditures for the median college library rose considerably more than for its ARL counterpart. For the 1977–87 decade, the median ARL library was slightly ahead.

V. TOTAL EXPENDITURES

In addition to the growth and decline of different budget components is the issue of total library expenditures. It is likely that many, if not most, academic librarians share the oft-cited view that library budgets in higher education have long been anemic. For example, in a recent article in *College & Research Libraries*, Barbara Moran refers to the "stringent budgets of the '70s and '80s."[20] "Stringency," of course, is in the eye of the beholder, although there is no question that during the 1970s and 1980s, particularly when measured in terms of constant dollars, library budgets did not sustain the growth they had experienced in the 1960s.

Table 23 summarizes total library expenditures for the Bowdoin List libraries over a twenty-year period.

The data from both sets of libraries, Bowdoin List and ARL alike, record a significant increase in total expenditures for the years under consideration. For comparative purposes, increases in the Consumer Price Index and the Higher Education Price Index are also provided. The latter index, which is concerned with the prices of those goods and services purchased by colleges and universities, has grown at a significantly faster rate than the Consumer Price Index. Nevertheless, the data in tables 24, 25, 26 and 27 show that percentage increases in total expenditures for both the college and the research libraries, even for some libraries in the lowest quartile of each group, have considerably outstripped price increases as measured by the HEPI.[21]

TABLE 23
TOTAL EXPENDITURES, 1967 TO 1987,
THIRTY-EIGHT COLLEGE LIBRARIES

	1966–67	1976–77	1986–87
Q_3	240,860	574,616	1,590,942
Median	199,786	448,911	1,213,180
Q_1	143,202	308,552	853,778

To underscore the relative prosperity of the 1960s for academic libraries, table 25 shows that for the median Bowdoin List library total expenditures rose almost nine times faster between 1961 and 1967 than the Consumer Price Index and more than three times faster than the Higher Education Price Index. For the next two decades, the differences are not nearly so great (and not nearly so great between the CPI and the HEPI, either).

For both sets of college libraries, the median library experienced a greater increase in total expenditures than the median ARL library, particularly from 1977 to 1987.

For the most part, the college directors were not concerned about the shift in expenditures to "other." To the question of how they viewed the significantly more rapid growth of the "other" expenditures category, first in terms of their own library, and then in terms of academic librarianship as a whole, thirty-five directors provided thirty-seven and thirty-eight responses respectively. The breakdown of their responses was as follows:

	Own Library (#)	In General(#)
"Very concerned"	2	2
"Somewhat concerned"	6	5
"Neutral"	2	3
"Fairly satisfied"	2	1
"Very satisfied"	2	1
"As irrelevant, since what is important is having enough money for materials, staff, and 'other' regardless of their relative proportions"	22	24
"As irrelevant for other reasons"	—	2
"Not the trend here"	1	—
	37	38

In terms of their own libraries, eight of the directors (between one-fourth and one-fifth) expressed concern, while four were satisfied. Regarding this trend in the profession, seven were concerned and two satisfied. In both theaters, of course, the great majority of respondents considered this relative growth in the "other" category of expenditures to be irrelevant.

The college library directors were divided in their responses to several questions related to collection growth which were raised in the course of the interviews, and they were unanimous in their responses to one other. Eleven of the directors thought that the number of volumes their library was adding each year would remain constant, six that they would increase, and four that they

TABLE 24
PERCENTAGE INCREASES IN TOTAL EXPENDITURES 1967 TO 1987,
THIRTY-EIGHT COLLEGE LIBRARIES

	1967–77	1977–87	1967–87
Q_3	184	174	612
Median	142.5	151.5	505.5
Q_1	107.5	120.5	384
CPI	78	90	238
HEPI	89	102	278

TABLE 25
TOTAL EXPENDITURES, 1960–61, AND PERCENTAGE INCREASES IN TOTAL EXPENDITURES 1961 TO 1987, TWENTY-EIGHT COLLEGE LIBRARIES

	Total Expend. 1960–61	% Incr. 1961–67	% Incr. 1967–77	% Incr. 1977–87	% Incr. 1961–87
Q_3	133,466	126	189	178	1,505
Median	100,797	97	147.5	159.5	1,122
Q_1	75,123	83	110	123	934
CPI		11	78	90	274
HEPI		29	89	102	386

TABLE 26
TOTAL EXPENDITURES, 1967 TO 1987, SIXTY-EIGHT ARL LIBRARIES

	1966–67	1976–77	1986–87
Q_3	2,799,073	6,406,850	13,967,683
Median	1,777,012	4,174,622	10,564,074
Q_1	1,314,158	3,309,771	7,772,439

TABLE 27
PERCENTAGE INCREASES IN TOTAL EXPENDITURES, 1967 TO 1987, SIXTY-EIGHT ARL LIBRARIES

	1967–77	1977–87	1967–87
Q_3	170	161	549
Median	135	141.5	455
Q_1	98	118	361
CPI	78	90	238
HEPI	89	102	278

would decrease. At the same time, twelve of the directors believed that the number of added volumes could decline to some extent because of telefacsimile, other delivery mechanisms, special arrangements with other libraries, etc. Seven thought that the number could not decline, one responded "possibly" and another did not know. Also, eleven of the directors believed that ownership was significantly less important than it used to be in terms of providing access, while seven thought it was not. Taken together, these responses indicate a combination of two factors: that the directors are more willing to contemplate such a decline than are other influentials on campus, and that they believe that such a course is more practicable once effective resource-sharing mechanisms become more common.

Finally, not one of the directors responded affirmatively to the following question: "Are we approaching a time of 'no-growth' collections, and, hence, can we stop worrying about increasing the amount of space devoted to library materials? Or at least a time of very slight collection growth?" Seventeen directors responded "no," three "not now, but in the foreseeable future," and one director thought that the number of volumes would continue to grow, but in formats that would not require much additional space. One director responded: "No. Show me one no-growth library." Another commented: "The number of volumes and titles will grow, but not in a way that will require much more space. Information will be coming in compact forms. In twenty years most back issues of periodicals will be on disk; presently we devote a lot of space to periodical backfiles. Supplementing this development are weeding and

the use of compact shelving. We've put our pre-1970 bound periodicals into compact shelving."

CONCLUSIONS

This study is both heuristic and empirical. It may raise as many questions as it answers. Among the most important conclusions are the following:

Between 1967 and 1987, about one-fourth of the college libraries in this study doubled the size of their collections; during the same period, about half the libraries belonging to the Association of Research Libraries grew by at least that same rate. Conversely, three-fourths of these college libraries and half the ARL libraries failed to double the size of their collections in this twenty-year period. It would seem, therefore, that there are by now enough exceptions to the "doubling-every-sixteen-years" rule for academic libraries to render it highly suspect as a general expectation in the last years of the twentieth century.

Although the rate of collection growth is probably slowing, none of the college library directors interviewed believes that he or she is presently facing a "no-growth" library situation. The interviews with directors revealed that many are still very collections conscious. Only four directors think that the number of volumes they are adding each year is likely to decrease in the near future.

Notwithstanding the concern expressed in recent years about the soaring prices of library books and periodicals, the prices of books and periodicals published in the United States grew much more rapidly between 1967 and 1977 than during the ensuing decade. A corollary finding is that, for the most part, the materials expenditures of the college libraries included in this study kept pace with those price increases. Indeed, expenditures for materials as a percentage of total expenditures have risen in the college libraries over the last twenty years. However, they have declined in the research libraries over the same period.

The increases in total expenditures for these college libraries and for the ARL libraries from the 1960s to the 1980s have significantly exceeded the increases in both the Consumer Price Index and the Higher Education Price Index, between 1977 and 1987 as well as between 1967 and 1977. The college libraries have fared better than the ARL libraries. This phenomenon of expenditures rising considerably more than inflation is likely related to the competition among colleges and universities for better students and faculty and for enhanced reputations.[22].

There are by now enough exceptions to the 'doubling every sixteen years' rule for academic libraries to render it highly suspect as a general expectation in the last years of the twentieth century.

The 60-30-10 rule, which reflected reality in the "typical" Bowdoin List library in 1960, certainly no longer applies either in the group of colleges studied here, or in the ARL libraries. As of 1986/87, the "typical" library showed a division closer to 40-40-20 in the former group, while in the ARL libraries the corresponding division is closer to 50-35-15. Kendon Stubbs explicitly, and Jerry Campbell rather more implicitly, have already called our attention to this shift away from 60-30-10 for the ARL libraries.[23]

The trends recorded here contradict Richard Talbot's contentions in 1984 that "the pattern of library budgetary allocation remains unaffected," that salaries and wages as a percentage of library expenditures have remained at 60% "since at least 1960," and that "the percentage of the library internal budget for acquisitions is fixed."[24] They also demonstrate that Herbert White was in error when he recently asserted (without documentation) that there has been a "transfer of funds from all other sources to the academic library materials budget over the last fifteen years."[25] Conversely, these

findings also raise questions about assertions that libraries generally have funded automation by taking funds from acquisitions.

It would be surpising if the college libraries were able to sustain this high a percentage for materials during the next decade, as they spend more on maintaining automated reference products and other automated library systems.

In the college libraries studied here, the proportion of expenditures going to the "other" category has grown enormously, from 9% in 1960/61 and 8% in 1966/67, to 18% in 1986/87. Contrary to authorities such as Barbara Moran and Charles Churchwell, and contrary to the initial supposition of this study, this growth has generally not come at the expense of the materials budget.[26] Instead, expenditures for materials have grown as a proportion of total expenditures, from 31% in 1960/61 to 38% by 1976/77 and holding at that percentage a decade later. (Indeed, data just received for the Bowdoin List libraries in 1988/89 show a 39% figure for the median library.) Rather, the relative decline of salaries/wages expenditures has accompanied the increase in the other two categories although the numbers of both professional and support staff have grown. The explanation for this set of circumstances is likely that costs for materials, and for items in the "other" category, have risen more rapidly than have the costs of people. Most consumers, including college and university administrators, will buy goods and services with an eye on economizing, and the services of library workers have been obtainable at a lower rate of dollar increase than have books, journals, supplies, maintenance, etc. This phenomenon is likely true of most categories of workers in the United States during recent decades, and it would seem to merit further study.

Among the college libraries, the growth in materials expenditures as a percentage of total expenditures is likely understated when the investigator takes into account the situation on many college or university campuses regarding audiovisual centers for housing films or videotapes, records, and slides, and for distributing audiovisual equipment around the campus. During the past twenty years or so, a number of audiovisual centers were either created within the administrative/budgetary structure of the library or were moved there. Such entities are generally more staff- and equipment-intensive than they are materials-intensive. To the extent that ARL libraries have come to contain media units, their materials expenditures as a proportion of the total are likewise probably understated.[27]

Conversely, another factor serves to inflate the reported materials expenditures of the ARL libraries. It is widely known that these expenditures include significant amounts for bibliographic utilities and other nonmaterials costs, thus exaggerating the amount actually spent on library materials. One librarian, from a medium-sized, non-ARL library, explained his library's practice of charging computerized cataloging costs to its materials budget as follows: "Our 'other' budget categories have not received the support for growth that our materials budgets have, so we find it logical to charge this major expense to materials."[28] In recent years, the *ARL Statistics* have included "Miscellaneous Materials Expenditures" (in addition to the more traditional "Other Library Materials") as a separate category to capture these expenditures, but it is likely that the new category does not presently include all nonmaterials costs reported as materials expenditures. As for the colleges, in only three instances did the Bowdoin List directors indicate that significant portions of materials funds were spent for electronic services, such as OCLC charges. Several more indicated that they were including as a part of their reported materials expenditures funds for online computer searching (ranging

between $2,000 and $9,000 annually).

It would be surprising if the college libraries were able to sustain this high a percentage for materials during the next decade because they spend more on maintaining automated reference products and other automated library systems. Some of them may be tempted to follow the lead of other libraries by "burying" some of their automation costs in what has traditionally been the materials budget. A subsequent article in this journal will discuss the state of automation within these college libraries and will make certain connections with the findings and opinions reported here.

The rate of increase in materials expenditures was substantially greater in the college libraries than in the ARL libraries between 1967 and 1977 and was also well ahead of that in ARL libraries for the 1967–87 period. For 1977–87, those increases were slightly greater in the ARL libraries. For both sets of libraries between 1967 and 1987, rates of growth in materials expenditures considerably outpaced the increases in U.S. book prices, but they fell considerably short of rising prices for U.S. periodicals (with a commensurately heavier burden on the research libraries, which have been devoting a larger proportion of their materials expenditures to periodicals than have the college libraries).[29] At the same time, to underscore once again the relative prosperity of the 1960s for academic libraries, between 1961 and 1987 the median increase in materials expenditures among thirty-three college libraries was 1,399% (see table 21), far outstripping even the 1,168% increase in U.S. periodicals prices for the same period. U.S. book prices increased by a comparatively modest 513%.

If, in fact, the prices of books and journals rose at a much faster rate between 1967 and 1977 than they have since, and if the rate of increase in materials expenditures during these decades has significantly exceeded the increases in book prices, why all the concern and frustration during the 1980s about inadequate acquisitions budgets? Two reasons appear to be especially germane, and they are quite familiar to collection development librarians although probably still not to many college and university administrators. One has been the rapidly rising prices of scholarly journals, with the bulk of the impact (though by no means all) felt by the research libraries. These libraries generally serve institutions which are relatively more research-oriented than the colleges and, hence, are more journal dependent than the college libraries. Consequently, they spend not only many more dollars on journals but also a higher proportion of their materials budgets on journals than the college libraries.

The other reason, somewhat more subtle, is that scholarly publishing continues to grow, so that even if academic libraries' acquisitions budgets kept pace with price increases, those acquisitions would continue to constitute, each year, a diminishing fraction of the world's output of recorded information. At the same time, it is not at all clear that this is a new problem; the topic warrants an in-depth study. The number of book titles published in the United States appears to have grown by some 77% between 1966 and 1986 (30,000 titles to 53,000), yet grew by 100% during the much shorter period between 1960 and 1966 (15,000 to 30,000).[30] In 1974, the Faxon Company's database held 38,000 serial titles as "active" and available for purchase; by 1988 that number had grown to 105,000 such titles.[31] Perhaps it is time that more academic librarians occasionally adopt the skepticism articulated by the director of one major research library early in 1990 at a public forum: "Perish the thought that any academic thought will go unpublished and that we will fail to store it."[32]

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14. The author's ERIC document, cited above, contains more complete data for each of this article's tables.
15. *Ibid.*, Appendix D.
16. Richard J. Talbot, "College and University Libraries: Lean Years and Fat Years—Lessons to Be Learned," *The Bowker Annual of Library and Book Trade Information* (New York: Bowker 1984), p.77–81; Kendon Stubbs, "Introduction," *ARL Statistics, 1987–88* (Washington, D.C.: ARL,1989), p.8; Barbara Moran, "The Unintended Revolution in Academic Libraries: 1939 to 1989 and Beyond," *College & Research Libraries* 50:30 (Jan. 1989); Jerry D. Campbell, "Academic Library Budgets: Changing 'The Sixty-Forty Split,' " *Library Administration & Management* 3:78 (Spring 1989).
17. *ARL Statistics, 1986–87*, p.56.
18. The price data for books and periodicals are from *The Bowker Annual of Library and Book Trade Information* for the following years: 1963, p.95–96; 1968, p.103, 105; 1978, p.318, 320; 1979, p.337; 1988, p.426–27. This information about price increases for books and periodicals is offered as a comparison to the materials expenditures increase. Because the data are for U.S. publications only, they do not capture price trends during these years for foreign publications, of particular significance for the research libraries. To provide a price for the cost of books in an academic year, an average price was derived for the two relevant calendar years. Periodicals, on the other hand, are paid for in advance for an ensuing calendar year; hence, price information for the appropriate calendar year was used.
19. Data concerning serials expenditures as a percentage of materials expenditures for a group of sixty-two liberal arts college libraries, in the author's possession.
20. Moran, "Unintended Revolution," p.29.

21. Data from which calculations were made for both indexes may be found in U.S. National Center for Education Statistics, *Digest of Education Statistics, 1988* (Washington, D.C.: U.S. National Center for Education Statistics, 1988), p.35. The HEPI data for 1986–87 were obtained by telephone from the National Center. See also D. Kent Halstead, *Inflation Measures for Schools and Colleges* (Washington, D.C.: National Institute for Education, 1983), p.50–51.
22. President Hanna Gray of the University of Chicago recently noted that in the years ahead, universities and colleges will face "sharpened competition for students, faculty and dollars at all levels." *The New York Times*, December 17, 1989, I, p.1. See also William O. Beeman, "Assessing Intensive Computing on the College Campus," in *Integrated Planning for Campus Information Systems*, Daphne N. Layton, ed. (Dublin, Ohio: OCLC, 1989), p.12.
23. Stubbs, "Introduction," p.8; Campbell, "Academic Library Budgets," p.78.
24. Talbot, "College and University Libraries," p.77, 80.
25. Herbert S. White, "Pseudo-Libraries and Semi-Teachers," *American Libraries* 21:105 (Feb. 1990).
26. Moran, "Unintended Revolution," p.30; Charles Churchwell, remarks at a conference of the Florida Chapter of the Association of College and Research Libraries, November 4, 1988, summarized in "The Academic Library Is More than an Information Center: Report on the Conference," by Betty D. Johnson, in *CLS Newsletter* (Spring 1989), p.6.
27. Michael S. Freeman, library director at Haverford College, provided author with this insight.
28. Sherman Hayes,"Budgeting for and Controlling the Cost of Other in Library Expenditures: The Distant Relative in the Budgetary Process," *Journal of Library Administration* 3:129 (Fall/Winter 1982).
29. See note 18, above.
30. *The Bowker Annual of Library and Book Trade Information*, 1962, p.59; 1967, p.45; 1988, p.403. To be sure, the proportion of these titles that would be appropriate acquisitions for academic libraries is not readily apparent.
31. Rebecca T. Lenzini, "Serial Prices: What's Happening and Why," *Collection Management* 12:23 (1990).
32. Discussion sponsored by the Financial Management Committee, Library Organization and Management Section, Library Administration and Management Association, Chicago, January 8, 1990.

Statement of Changes

Beginning with this issue, *College & Research Libraries* appears in a slightly different format. The size of the journal is now smaller to take advantage of standard paper size economies.

Ranking of Journals in Library and Information Science: A Comparison of Perceptual and Citation-based Measures

Mary T. Kim

A citation analysis of core library and information science journals was conducted to identify factors associated with subjective rankings of a journal's value in promotion and tenure decisions. Prestige rankings from a 1982 survey of ARL directors and library school deans were correlated with nine citation measures: total citation count, impact factor, immediacy index, references per paper, Price's Index, self-citation rate, popularity factor, citation factor, and consumption factor, with and without controlling for journal orientation, age, circulation, and index coverage. Results indicate that deans and directors may differ in their weighting of scholarliness and timeliness when rating journal value, especially when the practitioner-research orientation of the journal is considered.

In a 1982 survey of ARL directors and deans of library schools, David F. Kohl and Charles H. Davis obtained subjective ratings of thirty-one core library science journals in terms of their importance for promotion and tenure decisions.[1] Using a five-point scale, directors and deans rated those journals with which they were familiar. Kohl and Davis then used these ratings to rank order the journal set into a perceived hierarchy of journal prestige. Critics of subjective journal rankings have argued that such rankings are "artificially precise indicators"[2] which may, in fact, not be significantly different from each other.[3] Whether these rankings reflect an actual hierarchy of journal importance or whether they merely group journals into clusters of high and low prestige, members of the academic community do use them to identify top library and information science (LIS) journals. For example, in a statistical profile of *College & Research Libraries (C&RL)* on its fiftieth anniversary, Paul Metz described *C&RL* as "one of the most widely respected journals in librarianship," noting that ARL directors and library school deans ranked it first and third, respectively, in terms of "its value for tenure and promotion decisions at their institutions."[4] A "self-fulfilling prophecy" occurs because, once publicized, these subjective rankings influence assessment of the best outlet for a journal article and the subsequent weight assigned to it in personnel decisions.[5]

This author recalls a comment made at a discussion group on negotiating the tenure process held at an Association for Library and Information Science Education conference: "If it's not published in one of the top ten or twelve journals listed in the Kohl and Davis study, it doesn't count as much." If these journal rankings do, in fact, establish norms for the field, then

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Kohl and Davis' recommendation for additional research appears valid: namely, to take a "close look at the ranking of the journals to determine whether there are objective factors that correlate with journal prestige," such factors to be derived by citation analysis.[6] This paper presents the results of the recommended citation analysis. Its purposes are to determine whether journal characteristics do differentiate between varying levels of perceived LIS journal prestige and to determine if citation-based measures yield similar rankings within the LIS journal network. The goal is not to challenge the ranking assigned to specific journals, but to understand more fully the factors contributing to these rankings.

CITATION MEASURES

Actual journal use, citation-based measures, and subjective judgments are the three indicators typically used to rank journals. Each perhaps taps a different aspect of journal "worth," and each is potentially distorted by common and unique sources of bias. R. Todorov and W. Glanzel recently reviewed the more familiar journal citation measures used for journal ranking. A brief summary seems appropriate here.[7] The raw data for computing citation measures are the bibliographic references appearing in substantive papers (i.e., *source items*) within a set of journals for a specified period of time. These references are interpreted as links between journals, journals giving *references* to and receiving *citations* from each other. Once a citation analyst decides which subset of journals and source items is appropriate for a given purpose, citation measures may be computed.

Total citations are tallies of the citations received by a given journal. Because these are biased in favor of larger journals with more source items, citation analysts have developed size-independent measures. The *impact factor* is computed as the total citations given to a journal for a specified time period divided by the number of source items published in that journal during that same time period. Because the previous two years is the typical time period, the impact factor also measures how quickly authors cite work appearing in a journal. Although corrected for journal size, the impact factor may still be biased in favor of older journals or journals with review articles. The *immediacy index* is computed as the total citations received from journals published in the same year divided by the number of source items available for citation in a journal that year. Factors such as journal circulation or publication delay may influence both the impact factor and immediacy index. These three indicators measure journal usefulness as an aid in knowledge production. Whether cited positively or negatively, journal contents have stimulated or supported some written endeavor.[8]

Derek J. de Solla Price developed two alternative measures for scholarliness and the scientific "hardness" of a journal. He believed high *references per paper*, the total number of references in a journal divided by the number of source items in a journal, reflected the cumulative effect of knowledge building in a scholarly area. Price defined the normal range for scholarship as ten to twenty-two references per paper, with a typical value being fifteen. *Price's Index*, the proportion of the total references in a journal to work published within the last five years, indicates the rapidity of development of a field and the degree to which journal references were made to the research front of the field. Price stated that higher index values indicated harder, scientific journals, while lower index values indicated journals dependent on the archival literature, not the research front.[9] More recently, Sydney J. Pierce has suggested that Price's Index reflects not only the degree to which older research has been integrated into the knowledge base of a field, but also the level of consensus as to what constitutes the knowledge base for a field—the lower the index, the lower the consensus.[10] Obviously, citation norms of a field and the editorial policies of a journal may influence Price's Index and references per paper.

The final set of citation measures to be considered deals with popularity and the position of the journal in the information flow of a field. V. I. Yanovsky proposed ratios of citations to citations and journals to journals. He believed these to be better indices of interaction among sets of journals than other size-independent ratios such as the impact factor.[11] The *citation factor* is the ratio of the citations received by a journal in a year to the references given by a journal in the same year. This is the inverse of the input/output ratio described by Louis V. Xhignesse and Charles E. Osgood and may be interpreted as the degree to which a journal feeds or stores information in the journal network.[12] Journals with higher citation factors would feed information; journals with lower citation factors, store information. The *popularity factor*, the ratio of the number of journals citing a journal to the number of journals referenced by a journal, has been described as a measure more appropriate for identifying less research-oriented journals.[13] The *consumption factor*, the product of the citation factor and the popularity factor of a given journal, appears to tap dimensions other than journal quality. Journals with higher consumption factors tend to be older, with a higher circulation rate, and a lower number of references per paper.[14] The *self-citation rate*, the proportion of citations received by a journal which stem from the journal itself, also indicates the degree of interaction with the journal network. Highly specialized journals in discipline subfields or more practitioner-oriented journals with low referencing patterns would probably have higher self-citation rates.

Because each of the citation indicators reviewed appears to measure a different dimension of journal significance, they have all been used as ranking measures in this study. Discipline versions, similar to Graeme Hirst's discipline impact factor, have been computed for each of the indices involving total citation counts.[15]

CORRELATES OF SUBJECTIVE JOURNAL RANKINGS

Investigators ranking journals by one method often correlate these rankings with those obtained by another method, the goal being a better understanding of what their rankings actually represent. In a detailed review of journal ranking methods, Alan Singleton discussed problems with each approach and examined the relationship between methods.[16] Overall, he noted low correlations between subjective judgments of prestige and various citation rankings in the area of physics. In contrast, Bruce C. Bennion and Sunee Karshamroon found a moderately high multiple correlation ($R = .74$) between perceived usefulness of physics journals and a set of four citation indicators (total source items, impact factor, immediacy index, and citation factor). This correlation increased when journal circulation rate was considered ($R = .85$).[17] Other researchers have reported rank-order correlations between perceived quality and impact factor for journals in the social sciences (rho = .45), and subfields of psychology (rho = .39–.56), sociology (rho = .63), and economics (rho = .87).[18] John C. Smart found a low correlation between impact factor and perceived quality for 678 educational journals (rho = .21). Reanalysis of this relationship within journal types (i.e., core and allied) resulted in higher correlations (rho = .33 and rho = .52).[19]

Collectively, these studies demonstrate the need to study these ranking relationships within disciplines and to consider carefully the type of journals included in the discipline network. Analysts of professional knowledge structures support this latter recommendation, arguing that the journal literature of a profession consists of two different components—research-oriented and practitioner-oriented journals which vary in their referencing patterns and behaviors.[20]

Investigators have also reported that some citation indicators have higher correlations with perceived quality or use-

fulness than others. Michael D. Gordon noted that total citations correlated more highly with perceived prestige (rho = .61) than did the size-independent impact factor (rho = .45) or immediacy index (rho = .30). His study suggests that prestige may be more closely related to the size of a journal and dependency on it over time than the speed with which a journal is cited by later works.[21] Smart and C. F. Elton reported a low rank-order correlation between consumption factor and subjective judgments of quality for psychology journals (rho = .13). They concluded that the consumption factor ranked journal quality by some dimension other than the "communication of original research" normally measured by perceived quality rankings.[22] These studies suggest that citation measures do measure different facets of journal significance. Exploring the relationship between LIS prestige rankings and the set of citation measures would expand the current understanding of subjective rankings of LIS journals.

This review identifies the following sources of bias for citation-based and subjective journal rankings: discipline, journal orientation, age, size, and circulation. S. M. Dhawan, S. K. Phull, and S. P. Jain would add to this list coverage by indexing services.[23] Where possible, these extraneous factors have been considered in the selection of journals or in the relationships analyzed.

HYPOTHESES

The author posed the following directional research hypotheses to test common conceptions about prestige rankings:

Hypothesis Set 1: LIS journals with higher prestige rankings will typically (a) be older journals, (b) have higher circulation rates, (c) be covered by more indexing services, and (d) be more research oriented.

Because of the inconsistencies in research relating different types of ranking methods, nondirectional research hypotheses guided tests for the following relationships:

Hypothesis Set 2: LIS journal prestige rankings will be significantly correlated with journal rankings by (a) total discipline citations, (b) discipline impact factor, (c) discipline immediacy index, (d) references per paper, (e) Price's Index, (f) discipline citation factor, (g) discipline popularity factor, (h) discipline consumption factor, and (i) discipline self-citation rate.

To determine whether the hypothesized relationships between prestige and citation measures might be due to common factors such as journal age or circulation, the following set of nondirectional hypotheses was tested:

Hypothesis Set 3: LIS journal prestige rankings will be significantly correlated with journal rankings by (a) total discipline citations, (b) discipline impact factor, (c) discipline immediacy index, (d) references per paper, (e) Price's Index, (f) discipline citation factor, (g) discipline popularity factor, (h) discipline consumption factor, and (i) discipline self-citation rate, after controlling for journal age, journal circulation, index coverage, and journal orientation.

PROCEDURE

Because only citations from journals in the LIS discipline were to be considered when computing discipline citation measures, the first step in the study was to determine the appropriate journal set. As Patrick Doreian points out, the omission of key journals may distort citation measures more than the inclusion of less significant journals which contribute little to or receive little from the journal network.[24] Consequently, this study expanded the original thirty-one journal set used by Kohl and Davis. English language journals were added if they were listed as both citing and cited LIS source journals in the *Journal Citation Report* (JCR) of the *Social Science Citation Index*, were major ALA journals (i.e., not newsletters), and were consistently referenced by journals in the original thirty-one journal set. This iterative process of addition and deletion resulted in the fifty-two journal network listed in appendix A.[25]

Because Kohl and Davis conducted

their survey in fall 1982, this study used citation data from the 1983 and 1984 SSCI *Journal Citation Reports* to correspond to the time frame of development, submission, and final publication for papers written in fall 1982. Using citation data from two years also reduced journal idiosyncracies of subject focus for a given year. Sixteen network journals not covered by JCR required hand tallies of their 1983–84 references. Ten of these sixteen were in the original thirty-one journal network. Three of the original network titles were excluded because of low citations/references (*Harvard Library Bulletin* and *International Journal of Law Libraries*) or cessation of publication in 1983 (*Library of Congress Quarterly Journal*).

Discipline citation measures were computed for each of the twenty-eight remaining Kohl and Davis journals. Appendix B contains definitions for these measures. The 1983 *Ulrich's International Periodicals Directory* provided information on journal age, circulation, and coverage by indexing services. Using Price's minimum of ten references per paper as an indication of scholarly orientation, the author divided the journals into popular, practical journals such as *Library Journal, Wilson Library Bulletin,* and *School Library Journal,* and more research-oriented journals such as *Library Quarterly, College & Research Libraries, Journal of the American Society for Information Science,* and *Library Trends.* If a journal employed referees in its review process, it was classified as a more scholarly journal.[26]

RESULTS AND DISCUSSION

The twenty-eight LIS journals were rank ordered by each of the discipline citation measures as well as the three "demographic" journal characteristics (age, circulation, and index coverage). Table 1 compares the top dozen journals identi-

TABLE 1
TOP TWELVE JOURNALS IDENTIFIED BY EACH RANKING METHOD*

	Ranking Methods														
	Prestige		Citation-based Methods										Demographics		
Journal	ARL	LS	DTC	DIF	DII	RP	PI	DCF	DPF	DSCR	DCSF	AGE	CIRC	INDEX	(R/P)
CRL	X	X	X	X	X	X		X		X	X	X	X	X	R
LQ	X	X	X	X		X		X	X	X	X	X		X	R
JAL	X	X	X	X	X		X		X	X			X	X	R
LRTS	X	X	X	X	X	X	X			X		X	X		R
LibTr	X	X	X			X				X		X		X	R
IT&L	X	X					X						X	X	R
JASIS	X	X	X	X	X	X		X	X		X	X	X	X	R
LJ	X		X	X	X		X	X	X		X	X	X	X	P
AmLib	X		X	X	X		X	X	X	X	X	X	X	X	P
RQ	X		X	X		X	X	X	X	X	X		X	X	R
SpLib	X	X	X	X	X		X		X			X	X	X	R
WLB	X		X		X		X	X	X	X	X	X		X	P
LISR		X		X		X				X					R
JLH		X				X									R
JEL		X						X	X	X	X				R
DLQ		X			X	X		X	X	X					R
Online			X	X	X		X	X	X		X				P
SLMQ						X					X	X	X		R
SLJ								X		X	X	X	X	X	P
JIIM								X	X		X		X		P
LawLJ						X						X			P
IP&Mgt						X								X	R
MicroR				X	X										P
RSR							X								P
CollMgt															R
PubLib							X								P
ILibRev															R
LibAcq							X								P

*With the exception of DCSF, ranking is in descending order. See appendix A for journal abbreviations.

fied by these rankings to the top dozen identified by each of the perceived prestige rankings. Table 1 also lists the journal orientation for each title (R or P). The clustering of *x*'s at the top of table 1 suggests that the ranking methods collectively do identify a set of top journals. For example, at least eight of the eleven ranking methods ranked *College & Research Libraries, Library Quarterly, Library Resources & Technical Services, Journal of the American Society for Information Science, Library Journal, American Libraries, RQ, Special Libraries,* and *Wilson Library Bulletin* among the top dozen journals.

Hypothesis Set 1

To test the first set of hypotheses, Spearman rank order correlations were computed between the first three journal demographics and the two prestige rankings, first for the total journal set (N = 28) and then separately for the research (N = 17) and practitioner (N = 11) subsets.[27] An alpha level of .05 was used to test the first two sets of hypotheses. Because journal orientation is a dichotomous variable, prestige rankings were first reduced to a dichotomous level using a median split. Phi coefficients were then computed to analyze the prestige-orientation relationship. As table 2 indicates, the deans' prestige rankings were significantly correlated with journal orientation (phi = .56), confirming the research hypothesis that the more research-oriented the journal, the higher its prestige ranking. The broader mix of research-practitioner journals in the directors' top journals probably accounts for the lack of a significant relationship between journal orientation and director prestige rankings.

As table 2 further indicates, the data failed to support the hypothesized relationship between circulation and directors' prestige ranking for both the total journal set as well as the research and practitioner subsets. Similarly, no significant relationships occurred between age and directors' prestige rankings. This finding suggests that the directors' collective assessment of a journal's prestige was not based merely on its age, availability, or a wider readership. Table 2 reveals a different pattern for the deans' prestige rankings. Age was significantly correlated with prestige for the total journal set. This relationship became more apparent when analyzed for research and practitioner journal subsets (rho = .62 and rho = .84, respectively). A probable explanation is that older journals have established reputations, whereas the newer journals may still be shifting for position. In contrast, the deans' ranking was significantly related with circulation only within the practitioner set. One possible interpretation of these findings might be that library educators valued publication in more widely circulated practitioner journals, such as *Library Journal, American Libraries,* and *School Library Journal,* because of the service dimension of such writings while publication in more research-oriented journals was valued regardless of the journal's circulation.

TABLE 2
RANK ORDER CORRELATIONS BETWEEN PRESTIGE RANKINGS AND JOURNAL DEMOGRAPHICS FOR THE TOTAL JOURNAL SET AND FOR THE RESEARCH/PRACTITIONER SUBSETS

	ARL Prestige Rankings			LS Prestige Rankings		
Journal Demographics	Total (N = 28)	Research (N = 17)	Practitioner (N = 11)	Total (N = 28)	Research (N = 17)	Practitioner (N = 11)
Age	.28	.37	.28	.41*	.62†	.84†
Circulation	.20	.39	.01	.18	.25	.56*
Index coverage	.60†	.55*	.47	.56†	.50*	.71†
Journal orientation‡	.21	. . .	. . .	.56†	. . .	. . .

* $p \leq .05$, one-tail test
† $p \leq .01$, one-tail test
‡ Phi coefficients are reported for orientation-prestige relationships

Finally, results reported in table 2 confirm the hypothesized relationship between index coverage and journal prestige, with one exception. Directors' collective prestige ranking was not significantly related with index coverage for practitioner journals. Also worth noting is the relatively higher correlation between the deans' ranking and the index coverage of practitioner journals (rho = .71) compared to that for research journals (rho = .50). These findings are consistent with an overall pattern displayed by table 2: namely, that directors' rankings of research journals and deans' rankings of practitioner journals may more readily be accounted for by journal age, circulation or index coverage than the opposite pairing.

To interpret this correctly, the author needed to understand what age, circulation, and index coverage represent: scholarliness, popularity, or both. Spearman correlations among these three factors confirmed the expected: older journals circulated more frequently and were covered by more indexing services. After defining scholarliness by the references per paper measure and popularity by the popularity and consumption measures, rank order correlations based on the total journal set revealed no significant relationship between scholarliness and any of the three journal "demographics." In contrast, significant relationships existed between age and the two popularity measures (rho = .41 and rho = .46) as well as index coverage and the two popularity measures (rho = .58 and rho = .59). Particularly interesting were the high correlations between index coverage and the popularity measures within the practitioner set (rho = .93 and rho = .92). It would appear that the journal demographics represent popularity and consumption somewhat more than scholarliness. A plausible interpretation of table 2, therefore, might be that deans valued publication in practitioner journals because of their popularity and consumption while something beyond this shaped their rankings of research journals. In the case of the directors, it appears that rankings were generally formed independent of a journal's popularity or consumption. If such a bias existed for directors, it seems to have been directed towards research journals.

Hypothesis Set 2

To test the second set of hypotheses, Spearman rank-order correlations were computed between the prestige- and citation-based rankings for the total journal set as well as two subsets. These are italicized for each measure in table 3.

As hypothesized, both deans and directors assigned higher rankings to those journals receiving more direct citations. Total discipline citation counts were significantly correlated with prestige rankings, regardless of journal orientation. As table 3 indicates, the strength of this relationship seems more consistent across journal type for directors than for deans. Values of rho ranged from .65 to .71 for directors and from .54 to .71 for deans. The highest value for the deans occurred for the practitioner subset. It is interesting to see what occurs when examining the relationship between the size-adjusted impact factor and prestige rankings. While the relationship between prestige and discipline impact factor was similarly significant across journal types for directors, it appears to be strongest among research journals. For the deans, the impact factor was significantly correlated with prestige for the research journals (rho = .60). Once corrected for size and, by extension, popularity, the relationship between citation frequency (e.g., impact factor) and deans' prestige ranking disappeared for the practitioner journals. This appears consistent with earlier findings that total citation counts tend to be biased towards large journals.

As demonstrated by table 3, findings did not support the hypothesized relationship between a journal's immediacy index ranking and the deans' prestige ranking for any of the journal groupings. The directors, however, did value more highly those journals with a higher immediacy index (rho = .41). This was especially true among practitioner jour-

nals (rho = .63). Similarly, only for the directors did the relationship between prestige and a journal's Price's Index even approach significance (rho = .55, p = .081, practitioner set; rho = .45, p = .068, research set). Together these findings indicate that there was a tendency for directors to value more highly those journals reporting recent developments and being quickly cited by current writers in the field.

The overall absence of a significant relationship between Price's Index and the prestige rankings is not surprising given the bimodal distribution of citation age reported for the LIS field. Susan Bonzi's study of LIS citing behavior found mate-

There was a tendency for directors to value more highly those journals reporting recent developments and being quickly cited by current writers in the field.

TABLE 3
RANK ORDER CORRELATIONS BETWEEN PRESTIGE AND DISCIPLINE CITATION MEASURES WITH AND WITHOUT CONTROLLING FOR JOURNAL AGE, CIRCULATION, INDEX COVERAGE, AND ORIENTATION

Discipline Measures/ Controls	ARL Prestige Rankings Total (N = 28)	Research (N = 17)	Practitioner (N = 11)	LS Prestige Rankings Total (N = 28)	Research (N = 17)	Practitioner (N = 11)
Total Citations	.71†	.68†	.65*	.57†	.54*	.71*
Age	.65†	.63†				
Circulation	.70†		.74†	.60†		
Index	.64†		.82†			
Impact Factor	.70†	.78†	.67*	.50†	.60*	.46
Age	.71†	.74†	.77†	.53†	.63†	
Circulation	.72†	.79†		.51†		
Index	.59†	.71†				
Immediacy Index	.41*	.31	.63*	.34	.38	.31
Age			.82†			
Circulation			.72†			
Index						
Price's Index	.21	.45	.55	−.17	.14	.12
Age						
Circulation						
Index						
References per Paper	.22	.02	.04	.48*	.10	.02
Age				.56†		
Circulation				.57†		
Index						
Self-citation Rate	−.53*	−.46	−.28	−.52†	−.58*	−.30
Age	−.50†			−.52†	−.65†	
Circulation	−.48†			−.53†	−.62†	
Index						
Citation Factor	.19	.33	.23	.20	.56*	.64*
Age						
Circulation						
Index						
Popularity Factor	.35	.26	.41	.33	.51*	.56
Age						
Circulation						
Index						
Consumption Factor	.30	.33	.52	.30	.61†	.74†
Age						
Circulation						
Index						

* $p \leq .05$, two-tail test
† $p \leq .01$, two-tail test

rials less than five years old and materials more than fifteen years old were cited most frequently.[28] The research-oriented journals, in the present study, had a lower average Price's Index than the practitioner-oriented journals (.47 vs. .59). Given the mix of practitioner-research journals in the top twelve prestige journals and the lower, rather than higher, index values for the research journals, this author believes that Price's Index may be an inappropriate measure of journal quality within a professional field.

Price's Index may be an inappropriate measure of journal quality within a professional field.

As expected, the deans' prestige ranking was significantly related to a journal's average number of references per paper (rho = .48), while this was not the case for the directors' ranking. Because journal orientation was based on the number of references per paper, the low correlations within journal subgroups were also anticipated.

Earlier in this paper, it was noted that journals with higher self-citation rates tend to be more highly specialized within sub-fields of a discipline. This seems to be the case for LIS journals as well. Journals such as *Law Library Journal, School Library Media Quarterly, Journal of Library History, Philosophy & Comparative Librarianship,* and *Reference Services Review* had self-citation rates of .50 or higher. As reported in table 3, the prestige rankings of both directors and deans were inversely correlated with self-citation rates for all journals combined (rho = −.53 and rho = −.52, respectively). This finding also applied to the deans' assessment of research journals. Journals with higher self-citation rates tended to receive fewer citations from the LIS journal network and ranked lower on the discipline consumption factor. Consequently, this author concludes that, generally speaking, both directors and deans valued publication in journals which hold more central positions in the information flow of the journal network.

The final set of relationships concerns journal popularity as measured by discipline popularity factor, citation factor, and consumption factor. For these three measures, the data failed to support the hypothesized relationships with the directors' prestige rankings, consistent with the pattern revealed earlier in table 2. When the relationships were analyzed separately for the research and practitioner subsets, the deans assigned significantly higher prestige rankings to those research and practitioner journals having higher citation factors (rho = .56 and rho = .64, respectively). Practitioner journals with higher citation factors, such as *School Library Journal, American Libraries, Library Journal,* and *Wilson Library Bulletin,* tend to feed information to the LIS journal network. The same applies to research journals such as *Journal of Education for Library and Information Science, Library Quarterly, College & Research Libraries,* and the *Journal of the American Society for Information Science.* The rank order correlation between the deans' prestige ranking and the discipline popularity factor was significant only for the research journals. In contrast, the data supported the hypothesized relationship between deans' prestige ranking and the consumption factor for both the research and practitioner sets (rho = .61 and rho = .74, respectively). Practitioner journals with higher discipline consumption factors, such as *Wilson Library Bulletin, American Libraries,* and *Library Journal,* did receive somewhat higher prestige rankings from the deans. This confirmed the already reported research which suggested that the consumption factor better identifies older journals with higher circulation rates and fewer references per paper. The consumption factor may function differently, however, when used to rank research journals. The research journals with higher consumption factors and higher deans' prestige rankings, such as

Library Quarterly, Journal of the American Society for Information Science, and *College & Research Libraries,* were older journals but tended to have more references per article and represented a wider range of circulation rates.

Hypothesis Set 3

In order to test the last set of hypotheses, regression analysis was used to remove the effect of each journal's demographic factor from the nine citation measures and the Kohl and Davis prestige ratings. The three variables—age, circulation, and index coverage—were normalized through a logarithmic transformation prior to the regression analysis. Spearman rank order correlations were then computed on the remaining residual scores. Because of the number of tests performed, alpha level was set at the .01 level. To emphasize more clearly any patterns which may exist, table 3 reports only significant relationships under each citation measure. The following discussion emphasizes these patterns; the reader interested in actual correlation values is referred to table 3.

Given the previously determined finding that journal age, circulation, and index coverage correlate significantly with journal popularity and consumption, the results reported in table 3 are not surprising. When controlling individually for age, circulation, and index coverage, the relationship between total citations and deans' prestige rankings all but disappeared. This confirms the biased nature of total citations often attributed to age, size, and frequency of circulation. Controlling for circulation did not eliminate the previously reported relationship for the total journal set because of the low correlation between circulation and deans' prestige ranking reported earlier in table 2. In contrast, the directors' prestige rankings continued to correspond to citation count rankings, even after removing the effect of age, circulation, and index coverage. As table 3 demonstrates, this relationship held for the total journal set but less clearly for the journal subsets.

Removing the effect of age, circulation, and index coverage did not alter the overall relationship between either prestige ranking or the impact factor for the total journal set. Because impact factor already adjusts the size bias present in total citation counts, this was as expected. When the relationships within subgroups were considered, four of the six correlations between prestige and impact factor continued to be significant for the research journals while only one was significant for the practitioner journals. A different pattern occurred for the immediacy-prestige relationships when controlling for the three demographics. The relationship previously reported between the directors' ranking and the immediacy index disappeared for the total journal set but appeared to be even stronger for the practitioner journals. Similarly, even after controlling for age, circulation, and index coverage, the deans' prestige ranking continued to be correlated with the scholarliness measure of references per paper.

Both directors and deans valued publication in journals which hold more central positions in the information flow of the journal network.

Controlling for the three demographics did not alter the nonsignificant relationships previously reported for Price's Index. Also, the significant relationships between the deans' prestige rankings and the three popularity type measures—citation factor, popularity, and consumption—disappeared when controlling for the three factors. These findings are consistent with the fact that age, circulation, and index coverage were also shown to be related to popularity and consumption.

Finally, table 3 indicates that controlling for the demographics did not significantly alter the inverse relationships between prestige rankings and self-citation rate. The directors' ranking

continued to be significantly related to self-citation rate for the total journal set and the deans' ranking significantly related for the total set as well as the research subset.

CONCLUSIONS

As stated earlier, this study attempted to gain a better understanding of subjective journal rankings within the LIS field. The purpose was not to challenge the ranking of specific journals, nor to provide current rankings for LIS journals. Rather, an attempt was made to answer the following questions about a specific set of journal rankings. Were these subjective rankings consistent with those derived by more objective, citation-based measures; were these rankings biased by perhaps less scholarly factors such as journal age, circulation, or popularity; and if such relationships existed, were they consistent across journal types and journal raters?

Discipline citation measures identified a core of top journals which overlapped well with the core listings of directors and deans.

This study tested three sets of hypotheses. Some general patterns emerged.

1. Collectively, the discipline citation measures identified a core of top journals which overlapped well with the core listings of the directors and deans for a similar time period. This consistency between the citing behavior of contributors and the LIS journal literature suggests that the prestige rankings did represent norms for the LIS field at the time of the study.

2. In 1982, library school deans and ARL directors valued publication in journals which fed information to the network and had an impact on current writing in the field. Library school deans specifically valued publication in journals with a research orientation as reflected by a higher number of references per paper and in older practitioner journals with higher consumption values. ARL directors valued a mix of research-practitioner journals, but specifically valued research journals which tended to be cited, on the average, more heavily than other journals and practitioner journals which tended to be cited, on the average, more quickly than other journals.

3. Library school deans and ARL directors appeared to use different criteria in judging the value of a publication for tenure and promotion. Scholarliness, as defined by references per paper, and journal consumption were correlates for deans but not directors. Timeliness of information emerged as a factor for directors but not deans.

Beyond these general patterns, study findings support the need to consider research and practitioner journals separately when analyzing knowledge structures in a professional field. For example, the journal consumption factor appeared to be somewhat more appropriate for identifying quality practitioner-oriented journals; the discipline impact factor for identifying quality research journals; and the discipline immediacy index for identifying quality practitioner journals. In addition, this study has offered an approach for developing discipline versions of citation measures for journals not currently covered by available citation indexes and has presented data for an initial assessment of the construct validity of such measures. Discipline versions of total citation count and popularity-consumption-citation factors, for the most part, functioned as anticipated. Each measure was related to uncorrected ratings of prestige, but failed to be related once the biases of age, circulation, or index coverage had been removed. The size-adjusted discipline impact factor also functioned as expected for research journals, being correlated with prestige even after the effects of journal demographics were removed.

Given the small sample size in this study, especially within orientation

groups, additional research on an expanded journal network is needed to confirm these patterns, to determine the stability of the prestige rankings and detected relationships over time, and to provide further testing of the discipline citation measure approach.

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APPENDIX A. DISCIPLINE JOURNALS ANALYZED

Journals from Kohl and Davis Study
American Libraries [*AmLib*] (P)
Collection Management [*CollMgt*] (R)
College & Research Libraries [*CRL*] (R)
Drexel Library Quarterly [*DLQ*] (R)
Information Processing & Management [*IP&MGT*] (R)
Information Technology & Libraries [*IT&L*] (R)
International Library Review [*ILibRev*] (R)
Journal of Academic Librarianship [*JAL*] (R)
Journal of Education for Librarianship [*JEL*] (R)
Journal of Information and Image Management [*JIIM*] (P) [formerly *Journal of Micrographics; Micrographics Today*]
Journal of Library History, Philosophy & Comparative Librarianship [*JLH*] (R)
Journal of the American Society for Information Science [*JASIS*] (R)
Law Library Journal [*LawLJ*] (P)
Library Acquisitions: Practice & Theory [*LibAcq*] (P)
Library Journal [*LJ*] (P)
Library Quarterly [*LQ*] (R)
Library & Information Science Research [*LISR*] (R)
Library Resources & Technical Services [*LRTS*] (R)
Library Trends [*LibTr*] (R)
Microform Review [*MicroR*] (P)
Online [*Online*] (P)
Public Libraries [*PubLib*] (P)
Reference Services Review [*RSR*] (P)
RQ (R)
School Library Journal [*SLJ*] (P)
School Library Media Quarterly [*SLMQ*] (R)
Special Libraries [*SpLib*] (R)
Wilson Library Bulletin [*WLB*] (P)

Additional LIS Journals
The American Archivist
Aslib Proceedings
Bulletin of the Medical Library Association
Behavioral & Social Sciences Librarian
Canadian Library Journal
Collection Building
Database
Government Publications Review
IFLA Journal
International Classification
International Forum on Information and Documentation
Journal of Documentation
Journal of Information Science
Journal of Librarianship
Journal of Library Administration
Libri
Online Review
Program
Resource Sharing & Information Networks
Scholarly Publishing
Scientometrics
The Serials Librarian
Technical Services Quarterly
Top of the News

(R) indicates a research orientation; (P) indicates a popular, practitioner orientation.

APPENDIX B. DEFINITIONS OF CITATION MEASURES

Unless stated otherwise, citation counts mentioned in each of the following definitions are tallies of initial journal references appearing in the major source items in 1983–84 issues of the fifty-two LIS journal set:

1. Total discipline citations [TDC]: total citations received by a journal,
2. Discipline impact factor [DIF]: total citations received by source items appearing in 1981–1984 issues of a journal divided by the total number of source items appearing in 1981–83 issues of that journal,
3. Discipline immediacy index [DII]: total citations received by 1983 and 1984 source items of a journal from discipline journals published in the same year, divided by the total number of source items appearing in 1983–84 issues of that journal,
4. References per paper [RP]: number of references appearing in 1983–84 source items of a journal divided by the number of 1983–84 source items,
5. Price's Index [PI]: the proportion of total references in 1983–84 source items of a journal given to works published in the preceding five years (ie., 1979–1983 and 1980–1984),
6. Discipline citation factor [DCF]: total citations received by a journal, divided by the number of references given by that journal in 1983–84,
7. Discipline popularity factor [DPF]: total number of LIS journals citing a journal in 1983–84 divided by the total number of LIS journals referenced by a journal in 1983–84,
8. Discipline consumption factor [DCSF]: the product of the discipline citation factor and the discipline popularity factor, and
9. Discipline self-citation rate [DSCR]: the proportion of citations received which are self-citations.

IN FORTHCOMING ISSUES OF
COLLEGE & RESEARCH LIBRARIES

Automation in College Libraries
by Richard Hume Werking

Designing Library Instruction for Undergraduates
by Delia Neuman

The Changing Domain of Subject Access
by Prudence W. Dalrymple and Jennifer A. Younger

Role Identity of Women Academic Librarians
by Pamela J. Cravey

Scientific Journal Prices
by Kenneth E. Marks, Steven P. Nielsen, Craig H. Peterson, and Peter E. Wagner

Analyzing the Library Periodical Literature: Content and Authorship

Lois Buttlar

Sixteen library periodicals were analyzed with respect to various characteristics of their authors, including sex, occupation, affiliation, and geographic location. Subject coverage was also examined, as well as research methodologies employed (if any), and page length of the article. A total of 1,725 articles are written by 2,072 authors, of whom 961 (47.83%) are male and 1,048 (52.17%) are female. In spite of the fact that librarianship is female-dominated, there are almost as many articles written by men as by women, although a slow closing of the gap between the proportions of male and female contributors, especially among special librarians, is apparent. No differences in the percentages of research-based studies or non-research based writing by either sex are evident. Academic librarians account for the major share of publication activity (over 61%), although on a percentage basis, library school faculty are the most productive. Full professors publish the most in library schools, closely followed by assistant professors. The Northeast and the Midwest claim the largest share of authors, not too surprising with the large share of academic institutions and library schools located in these two geographic regions. Research-based articles are on the increase, with survey methodology reported the most frequently. The subjects of automation, management, and cataloging are still the most popular. Individual journal titles are also analyzed with respect to the types of authors they publish.

Sharing information in the library profession is largely dependent on the library periodical literature. The advantages of the journal include its currency, its capability of addressing many and varied topics, and its ability to disseminate widely the findings of investigations of major problems or specific aspects of them.[1] It is also an important means of helping to close the gap between researchers and practitioners.[2] The proliferation of library literature is evidence of the growing maturity of librarianship. Norman D. Stevens points out that library publishing evolved slowly in quantity and quality from an emphasis on bibliographies and other "tools of the trade" to materials of a more scholarly nature "designed for use by librarians and information scientists in the performance of their professional duties and in their professional education and development."[3]

The profuse, rich, and diverse body of literature that now exists can be attributed to several factors. One, of course, is the requirement of library and information science faculty to publish in order to receive tenure and career advancement. Some writers suggest that the increased trend toward faculty status for academic librarians is partly responsible; others argue that some libraries provide a work environment that encourages experi-

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mentation with new approaches and technological innovations thus stimulating publication as a means of communicating new ideas, techniques, and findings.[4]

The need to study the literature of librarianship and to monitor trends and changes related to its characteristics and its authors is recognized and well documented.[5] David Kaser used the literature to review a century of academic librarianship in his bicentennial article, as one of several such analyses.[6] Studies that determine "who publishes where and what they publish" also provide a profile of what Richard Cole and Thomas Bowers call "the sociology of the literature."[7] The periodical literature in the field of librarianship has been analyzed from several points of view. Some investigators, such as Charles McClure and Ann Bishop,[8] John Budd,[9] and Thomas Childers[10] have studied its status. Others, including Stephen Atkins,[11] Gloria Cline,[12] and Patricia Feehan, W. Lee Gragg, W. Michael Havener, and Diane Kester,[13] have analyzed its subject focus, or its format (research-based article, essay or opinion article, etc.). Some scholars have examined research methodologies employed and the use of statistics,[14,15] while John and Jane Olsgaard's study[16] and those of Paula de Simone-Watson[17,18] Martha Adamson, and Gloria Zamora,[19] have described various characteristics of authors, such as sex, age, education, occupation, affiliation, and geographic distribution.

Some studies combined two or more approaches, such as the one by Soon Kim and Mary Kim, which compared two consecutive decades of trends in authors' occupations and research methodologies employed in *College & Research Libraries*, and the Feehan, et al., study in which ninety-one library science journals published in 1984 were analyzed for trends in research subjects and methodologies.[20] Martyvonne Nour conducted a quantitative analysis of research articles in forty-one core journals published during 1980 to determine methodologies and subject classification, and also analyzed the references, end notes, and bibliographies following each article.[21] Bluma Peritz, in her comprehensive doctoral dissertation, analyzed the American and British library science periodical literature from many aspects, including growth over the years, research methodology, subject, author affiliation, accompanying citations, and type of user.[22]

The present study makes a unique contribution by examining the entire contents of periodicals, including nonresearch articles, research-based articles, reviews, and various communications such as editorials, letters, announcements, and news. Sixteen basic library science journals were analyzed for a two-and-a-half-year period from 1987 to 1989 with respect to authorship, topical coverage, and type of research methodology employed, when applicable. An attempt was made to answer the following questions: Is there a difference in the amount of publishing done by males and females in the library literature? What are the occupations, affiliations, and geographic locations of contributing authors? Which category of librarians and related professionals is the most productive? How much do library educators publish by rank? Which library schools have the most productive faculty members in terms of publication? Which journals are most likely to publish contributions from a certain category of author with respect to sex, occupation, or geographic location; to focus on particular subjects; or to publish research-based as opposed to nonresearch articles?

METHODOLOGY

Sixteen journals were selected, with first preference given to general titles that not only represent the profession as a whole but also include at least some research-based articles. Thus, two major titles, *Library Journal* and *American Libraries*, were excluded because they contain numerous, brief nonresearch items. An attempt was made to represent the major types of libraries and categories of library and information science (e.g., academic, public, school, and special li-

braries; administration, public services, systems, technical services). The literature was also examined for lists of "core" publications and journals so designated in prior studies. Peritz had determined that thirty-nine titles represented core journals.[23] David Kohl and Charles Davis[24] identified the thirty-one most prestigious journals based on the rankings of ARL (Association of Research Libraries) library directors and deans of library and information science schools, a listing used subsequently by Stuart Glogoff[25] and Atkins.[26] Journals selected for this study include:

College & Research Libraries
Information Technology and Libraries
Journal of Academic Librarianship
Journal of Education for Library & Information Science
Journal of Library Administration
Journal of American Society for Information Science
Libraries and Culture
Library and Information Science Research
Library Quarterly
Library Resources & Technical Services
Library Trends
Public Library Quarterly
RQ
School Library Media Quarterly
Serials Librarian
Special Libraries

The overlap with titles used in previous studies is very high. Thirteen of the titles correspond to those ranked as the top fifteen by library school deans and are also listed as those most valued by ARL directors. Fourteen of the sixteen are on the list of 1980 core journals identified by Nour, and ten are on the list of eleven titles Watson identified as major journals in the field.

Each journal issue was examined for the period January 1987 through June 1989. The author's sex, occupation, affiliation, and geographic location, as well as the subject coverage of the article, research methodology employed, if any, and the page length of the article were recorded for each item (article, editorial). Although the extent of coverage given to reviews is covered, individual reviewers are excluded in the present study. For each article, a code sheet was completed to gather the above data which were then entered into the KSU main-frame computers for frequency distributions and cross tabulation analysis. Sex of the author was based on the first name. In a few instances the gender associated with the name was unclear. These cases were labeled "nondesignated," after every effort was made to identify gender.

A list of twenty-six occupations and fifteen affiliations was compiled based on actual examination of a sample set of journals, and cross tabulations were run to determine how many librarians in a particular occupation (e.g., reference, catalog, etc.) worked in a particular setting (academic library, special library, etc.). In an attempt to be consistent with earlier studies, geographic locations were classified from one to five based on the regions designated by the ALA Committee on Accreditations of graduate library school programs.[27] The states that comprise each region are:

1. Northeast: Connecticut, Delaware, Washington, D.C., Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont;
2. Southeast: Alabama, Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, West Virginia;
3. Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin;
4. Southwest: Arizona, Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma, Texas; and
5. West: Alaska, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming.

In the case of schools of library and information science, names of individual schools were also tabulated.

A research-based article was defined as one in which a formal research methodology was used in order to collect and/or analyze data (e.g., survey or interview, experiment, content analysis, statistical analysis of existing data, devel-

opment of linear programming or other mathematical model, case study, historical study with extensive primary and secondary sources, citation analysis or bibliometrics, and an observation/field study) as opposed to an opinion paper, description of the status quo, editorial, book review, or news/announcements.

Because all components of the literature were considered, including brief pieces, subjects were analyzed by the total percentage of pages of coverage each represented. Subject categories were based on analysis of the articles themselves in a manner similar to Atkins' study of subject trends over a ten-year period (1975–1984).[28]

FINDINGS

Information was recorded for a total of 1,725 articles in sixteen journals (see table 1). Specific authors were not attributed to 198 of the items (instances presumably where the journal editorial staff is responsible for content). The 1,527 articles where authorship is indicated were written by a total of 2,072 authors, taking into consideration cases of multiple authorship. It was found that each article had an average of 1.3 authors.

Sex of Author

Of the 2,072 authors, 961 are male (47.83%) and 1,048 (52.17%) are female,

TABLE 1
DISTRIBUTION OF ARTICLES BY NUMBER OF AUTHORS

Authors	Articles No.	Articles %
No author indicated	198	11.48
Single author	1,045	60.58
Two authors	375	21.74
Three authors	78	4.52
Four authors	23	1.33
Five authors	6	.35
Total	1,725	100.00

as compared to the ten-year study by the Olsgaards, where the percentage of women publishing ranged from 21.2% to 41.3%.[29] Four of the five journals in the Olsgaard study overlap with those in the present study (*C&RL*, *LQ*, *Library Trends*, and *RQ*). Table 2 provides the distribution of the sex of authors contributing to different journals. *Libraries and Culture* has the largest percentage of male authors (75.38%), followed by the *Journal of the American Society for Information Science* with almost two-thirds of its contributors being men. Findings regarding the latter journal support a 1982 study by Gloria Zamora and Martha Adamson,[30] which showed a generally increasing trend in women contributors to *Special Libraries* (47.5% at the time of their article)—a trend which rose to 60% by 1989. However, the ratio of females to males in SLA membership is about four

TABLE 2
DISTRIBUTION OF MALE AND FEMALE AUTHORS BY JOURNAL

Journal	Males No.	Males %	Females No.	Females %	Not Determined
College & Res. Libs.	106	54.50	84	45.50	7
Info. Tech. & Libs.	64	48.85	67	51.15	0
Jour. of Acad. Lib.	81	54.00	69	46.00	6
J. Amer. Soc. Inf. Sci.	127	64.68	67	35.32	21
J. Ed. For Lib. & Inf. Sci.	42	30.66	95	69.34	4
J. of Lib. Admin.	56	53.33	49	46.67	2
Libraries & Culture	49	75.38	16	24.62	4
Lib. & Inf. Sci. Research	48	53.09	39	46.91	8
Library Quarterly	38	67.86	18	32.14	2
Lib. Resources & Tech. Ser.	38	31.93	81	68.07	1
Library Trends	67	47.86	73	52.14	2
Public Library Quarterly	23	57.50	17	42.50	1
RQ	59	40.97	85	59.03	6
Sch. Lib. Media Quarterly	27	21.60	98	78.40	2
Serials Librarian	90	42.86	120	57.14	7
Special Libraries	46	39.66	70	60.34	4
All Journals	961	47.83	1048	52.17	

to one.[31] On the other hand, as might be expected, *School Library Media Quarterly* has the largest share (89.40%) of female writers, with *Library Resources & Technical Services* in second place with 68.07%. In spite of the fact that librarianship is female dominated, there are almost as many articles written by men as by women, and no differences in the percentages of research or nonresearch based writing by either sex are evident.

In spite of the fact that librarianship is female dominated, there are almost as many articles written by men as by women.

Sex and Occupation of Authors

Cross-tabulations of authors by sex and occupation (see table 3) reveal that 56% of the library directors who publish are male, although males account for 20% or less of the total library work force.[32] The percentage of female authors increases somewhat for those in assistant director or other secondary-level administrative positions. The largest percentage of females in management positions is in the technical services. Again, female special librarians publish slightly more than 50% of the literature, although their representation in ALA is more than 75%.[33] In the library school setting, where male and female distribution is approximately equal,[34] males publish only slightly more than females. It is interesting to note that while male library school deans outnumber females, female deans are more highly represented in the periodical literature.[35] In addition, for faculty outside of library schools the proportion of male/female authorship approximates the actual breakdown of male and female higher education faculty for all disciplines which, according to the U.S. Department of Education, is approximately 72% male to 28% female.[36]

Occupation and Affiliation of Authors

Twenty-six different occupations were cross tabulated with fifteen different affiliations of the 2,017 authors for whom these data were available. They are listed in order of frequency in table 4. Li-

TABLE 3
DISTRIBUTION OF AUTHORS BY SEX AND OCCUPATION

Occupation	Males		Females	
	No.	%	No.	%
Lib. Deans/Dirs.	131	56.47	101	43.53
Central Administrators	62	44.93	76	55.07
Head, Public Services	29	34.12	56	65.88
Reference Librarians	77	45.03	94	54.97
Head, Technical Services	26	28.89	64	71.11
Tech. Services Librarians	32	32.00	68	68.00
Head, Systems	17	45.95	20	54.05
Systems Analysts	7	31.82	15	68.18
Head, Collection Development	14	41.18	20	58.82
Collection Dev. Librarians	10	52.63	9	47.37
Non-Designated Librarians	84	52.17	77	47.83
Library School Deans	21	42.00	29	58.00
Library School Faculty	210	52.63	189	47.37
Graduate Students	10	33.33	20	66.67
Other Faculty	96	69.06	43	40.94
Non-Librarians	25	48.08	27	51.92
Special Librarians	31	47.69	34	52.31
School Media Specialists	6	13.64	38	86.36
Editors	21	42.00	29	58.00
Children's Librarians	0	00.00	4	100.00
Consultants	29	72.50	11	27.50
All Other	28	65.12	14	34.88
Total	966	48.18	1,039	51.82

TABLE 4
MOST FREQUENT OCCUPATIONS/AFFILIATIONS IN RANK ORDER

Rank	Occupation/Affiliation	No.	%
1	Faculty, Library and Info. Sci.Schools	377	18.69
2	Ref./Pub. Serv. Librarians, Acad. Libraries	241	11.95
3	Academic Library Deans/Directors	187	9.27
4	Tech. Serv. Librarians, Acad. Libraries	165	8.18
5	Non-Lib. and Info. Sci. Faculty	151	7.49
6	Special Librarians, Special Libraries	101	5.01
7	Directors/Admins., Special Libraries	82	4.07
8	Lib. and Info. Sci. Deans/Directors	63	3.12
9	Editors/Staff, Publishers	62	3.07
10	Consultants	49	2.43
11	Coll. Mgmt. Librarians, Academic Libraries	48	2.38
12	Non-Desig. Librarians, Academic Libraries	47	2.33
13	Systems Librarians, Academic Libraries	45	2.23
14	School Media Specialists, Schools & Districts	39	1.93
15	Graduate Student, Lib. and Info. Sci. Schools	31	1.54
16	Admins., Publishers	30	1.49
17	Public Library Directors/Admins.	28	1.39
18	Special Librarians, Academic Libraries	27	1.34
19	Non-Librarians, Special Libraries	22	1.09
20	Admins., Professional Associations	21	1.04
21	Reference Librarians, Public Libraries	19	.94
22	Admins., School Med. Centers and School Dists.	18	.89
23	Non-Librarians, Networks, Utilities, Consortia	17	.84
24	Systems Librarians, Special Libraries	17	.84
25	Admins., Networks, Utilities, Consortia	16	.79
26	Tech. Services Librarians, National Libraries	13	.64
27	Reference Librarians, Special Libraries	13	.64
28	Tech. Services Librarians, Special Libraries	12	.59
29	Admins., Non-Lib. and Info. Sci. Depts.	10	.50
30	Admins., Consulting Firms	10	.50
31	Tech. Services Librarians, Public Libraries	9	.45
32	Dir./Faculty, Learning Resource Centers	7	.35
33	Reference Librarians, National Libraries	5	.25
34	Children's Librarians, Public Libraries	4	.20
35	Systems Librarians, Networks, Util., Consortia	4	.20
All Other		27	1.34
Total		2,017	100.00

brary and information science faculty total 377, representing the largest category overall. Of the faculty, 140 full professors are the largest group, followed by 118 assistant professors, fifty-two associate professors, and sixty-seven whose rank is not indicated. If sixty-three deans (or directors) and thirty-one graduate students (almost all at the doctoral level) are also included, there is a grand total of 471 contributors (23.35%) from library schools.

Reference and public service librarians in academic library settings total 241, representing the second largest category of authors overall, and also the primary category in *College & Research Libraries* and, not surprisingly, *RQ*. Reference librarians in all settings total 278, as compared to 199 technical services librarians. A total of 187 authors fall into the category of academic library deans/directors and their assistants and associates, the third largest category. There are 165 technical services librarians, bringing librarians (excluding faculty) in academic settings to a total of 760 (37.68%), regardless of position. Together academic librarians and authors in library schools account for 61.03% of all journal publishing.

Another group of 151 faculty members represents those in other departments—primarily computer science, communication, educational and/or instructional technology programs. Authors in special library settings are responsible for approximately 13% of the literature;

public librarians, an additional 3.37%.

Library and information science faculty head the list of authors in *Journal of Education for Library and Information Science, Libraries and Culture, Library and Information Science Research, Library Quarterly, Public Library Quarterly,* and the *Journal of the American Society for Information Science.* In the latter journal, authorship is almost evenly attributed as well to non-library science faculty, because many of the contributors are computer science faculty or from other academic departments. Likewise, the *Public Library Quarterly* has an almost equally large group of library directors and administrators contributing to that journal. Library directors, deans or other administrators are the major contributors in the *Journal of Academic Librarianship,* the *Journal of Library Administration,* in *Library Trends,* and in *Special Libraries.* In *Information Technology & Libraries* systems librarians and department heads in academic settings account for the majority of contributors; in *Library Resources & Technical Services* and in *Serials Librarian* technical services librarians and department heads in academic settings published the most.

Location of Authors

The largest number of authors is in the Northeast. The next largest group is in the Midwest, followed by authors in the West, the Southeast, and finally the Southwest. Generally speaking these findings support those of the Olsgaard, and Adamson and Zamora studies. Because academic librarians and library school faculty publish the most, the concentration of authors in the Northeast and Midwest is due to the number of large academic library collections in institutions in these areas (thirty-one of top fifty)[37] and the preponderance of library schools (sixteen in the Northeast and thirteen in the Midwest).[38] Likewise, the largest number of the twenty-six public libraries with 1 million or more volumes are found in the Northeast (eight) and the Midwest (nine).[39] The number of authors by journal in each region, as well as Canada and all other foreign countries (as one group), is indicated in table 5. Six of the journals clearly have their largest share of contributors in the Northeast: *Information Technology and Libraries, JASIS, Library Resources and Technical Services, School Library Media Quarterly, Serials Librarian,* and *Special Libraries.* The largest group of authors contributing to *College & Research Libraries* is almost equally divided between the Northeast and the Midwest. The *Journal of Academic Librarianship, Journal of Education for Library and Information Science, Library and Information*

TABLE 5
GEOGRAPHIC DISTRIBUTION OF AUTHORS BY JOURNAL

Journal	Location NE	SE	M	SW	S	C	Other
Coll. & Res. Libs.	46	27	56	15	47	3	3
Info. Tech. & Libs.	38	15	37	19	21	8	3
J. of Acad. Lib.	33	16	78	9	14	6	1
J. Amer. Soc. Inf. Sci.	89	15	32	18	22	1	22
J. Ed. Lib. & Inf. Sci.	28	11	47	20	13	12	12
J. of Lib. Admin.	20	19	17	29	14	2	2
Libraries & Culture	9	3	16	9	12	1	18
Lib. & Inf. Sci. Research	12	13	21	16	11	4	13
Library Quarterly	7	5	30	1	7	4	1
Lib. Res. & Tech. Ser.	55	13	32	5	5	2	1
Library Trends	45	12	48	11	18	2	4
Public Lib. Quarterly	4	3	4	12	8	2	3
RQ	29	14	66	17	10	5	1
Sch. Lib. Media Quart.	43	27	20	19	9	1	1
Serials Librarian	70	32	38	11	32	4	21
Special Libraries	55	10	24	9	14	3	1
Total	583	235	566	220	257	62	122
Percent All Journals	28.5	11.5	27.7	10.7	12.6	3.0	6.0

Science Research, Library Quarterly, Library Trends, and *RQ* draw the bulk of their contributors, at least for the time period under study, from the Midwest. The largest percentage of contributors to *Libraries and Culture* is actually from countries other than the United States and Canada, giving it the most international perspective of all the journals in the study. The largest percentage of U.S. contributors to *Libraries and Culture* is located in the Midwest. It should be noted that *Journal of the American Society for Information Science, Journal of Education for Library and Information Science, Library and Information Science Research,* and *Serials Librarian* also had a large number of international contributors. Only two of the journals attract large shares of contributors from the West: *Journal of Library Administration* and *Public Library Quarterly.*

The distribution of library science faculty by geographic region and the identification of specific library schools with rank of faculty members are provided in tables 6 and 7, respectively. The Northeast and the Midwest have the largest number of authors, with the Midwest slightly ahead.

Watson notes that studies of publishing by academic institutions are "generally conducted to provide some measure of the excellence of the academic programs in question on the presumption that faculties that are productive in publishing will provide a high-quality educational program for students."[40] While institutional requirements and the extent of the library and information science program are definitely factors in publishing conducted at individual institutions, the quality of the program is obviously also an important variable. When examining the distribution of library school faculty by academic institutions, the faculty in library schools at North Carolina and Wisconsin have the largest share with twenty-seven authors each, followed by Louisiana and Illinois with twenty-six and twenty-five authors respectively. Other library schools with

TABLE 6
LIBRARY AND INFORMATION SCIENCE SCHOOL AUTHORS BY GEOGRAPHIC LOCATION

Region	No.	%
1. Northeast (Conn., Del., D.C., Maine, Md., Mass., N.H., N.J., N.Y., Pa., R.I., Vt.)	119	25.27
2. Southeast (Ala., Fla., Ga., Ky., N.C., S.C., Tenn., Va., W. Va.)	63	13.38
3. Midwest (Ill., Ind., Iowa, Kans., Mich., Minn., Nebr., N.Dak., Ohio, S.Dak., Wis.)	129	27.39
4. Southwest (Ariz., Ark., La., Miss., N.M., Okla., Texas)	61	12.95
5. West (Alaska, Calif., Colo., Hawaii, Idaho, Mont., Nev., Oreg., Utah., Wash., Wyo.)	39	8.28
6. Canada	28	5.04
7. All other countries	32	6.79
Total	471	100.00

TABLE 7
LIBRARY AND INFORMATION SCIENCE FACULTY/GRADUATE STUDENT AUTHORS BY POSITION

Position	No.	%
Deans/Directors*	63	13.38
Professors	140	29.72
Associate Professors	52	11.04
Assistant Professors	118	25.05
Non-Designated Faculty Rank	67	14.23
Graduate Students	31	6.58
Total	471	100.00

*Includes associate and assistant deans in cases where no other faculty rank was indicated.

ten or more authors include (in rank order) Michigan, Drexel, Indiana, Syracuse, Rutgers, Simmons, South Carolina, UCLA, Western Ontario, UC (Berkeley), Chicago, Iowa, and Texas (Austin). Authors affiliated with these schools account for 64.53% of all faculty contributions to the literature. The remaining 35.47% are distributed among fifty-two U.S. and thirty non-U.S. schools (see table 8).

Research Methodology

Of the 1,725 articles included in the study, a total of 500 meet the criteria for inclusion in the category of research-based articles. The majority of the writings, 1,225 items, are not research-based and consist of news announcements, letters, and descriptive or opinion papers. When analyzing the literature in terms of the percentage of total pages, as opposed to number of articles devoted to research and nonresearch, total page content devoted to nonresearch is 61.65% (as opposed to 71% when analyzing by articles), indicating that research-based articles are lengthier than nonresearch-based ones (see table 9). Some studies employ more than one

TABLE 8
FACULTY BY RANK AND MOST PRODUCTIVE SCHOOLS

School	Deans	Faculty	Graduate Students	Total	%*
N. Carolina	1	26	0	27	5.73
Wisconsin	2	25	0	27	5.73
Louisiana	5	19	2	26	5.52
Illinois	5	19	1	25	5.31
Michigan	0	21	1	22	4.67
Drexel	0	19	2	21	4.46
Indiana	8	12	1	21	4.46
Syracuse	1	18	1	20	4.25
Rutgers	1	15	0	16	3.40
Simmons	0	16	0	16	3.40
S. Carolina	1	14	0	15	3.18
UCLA	1	6	8	15	3.18
W. Ontario	2	10	2	14	2.97
UC, Berkeley	0	9	1	10	2.12
Chicago	0	10	0	10	2.12
Iowa	1	9	0	10	2.12
Texas	0	8	2	10	2.12
Total	28	256	21	305	64.53†

*Percentage is based on total library school authors (471).
†Represents schools with ten or more authors; other 35.47% is distributed among fifty-two U.S. and thirty non-U.S. additional schools.

TABLE 9
BREAKDOWN OF RESEARCH AND NONRESEARCH CONTENT BY PAGES OF COVERAGE

Content	Pages	%
Nonresearch	10,459	61.65
Survey	1,908	11.25
Experiment	629	3.71
Content Analysis	143	.84
Statistical Analysis	285	1.68
Mathematical Model	293	1.73
Case Study	281	1.66
Historical Study	1,480	8.72
Cit. Anal./Bibliometrics	246	1.45
Observation/Field Study	125	.74
Bibliographies	827	4.87
Interview	148	.87
Model Dev./Validation	142	.84
Total	16,966	100.00

research methodology, which accounts for the fact that 526 methodologies are noted in 500 research studies. No attempt was made to analyze the type of statistics employed, if any, for collecting or interpreting data.

Table 10 shows the breakdown of research-based articles by journal title. Collecting data by means of a survey is still the most popular means of conducting research. It had more pages devoted to it than any other methodology in *College & Research Libraries, Information Technology and Libraries, Journal of Education for Library and Information Science, Library and Information Science Research, Public Library Quarterly, RQ, School Library Media Quarterly,* and *Special Libraries*. Approximately 30% of the articles are research-based, an increase from the 1984 findings of Feehan, et al., who reported that 23.6% of the articles in their study were research oriented,[41] and from the 24.4% Nour found in 1980.[42] It also agrees with Coughlin and Snelson who found that of the papers presented at ACRL conferences, 31.5% to 33% have been devoted to research.[43] The current study supports Peritz' indication that journal articles are increasingly based on research,[44] a finding confirmed by Kim and Kim's analysis of *College & Research Libraries* between 1957 and 1976.[45]

Historical studies are also prevalent, with a large number of them in *Libraries and Culture,* and, to a lesser degree, in *Library Quarterly* and *Library Trends*. Subject bibliographies are also a common feature of the library and information science literature. *Journal of Academic Librarianship* has a regular column providing subject bibliographies, as does the *Serials Librarian*. The *Journal of the American Society for Information Science* led in the use of the scientific experiment, although a much larger share of the journal's content is devoted to mathematical and programming models. The *Journal of Library Administration* devotes the most space to case studies.

Subject Coverage

Subject coverage was analyzed by computing the percentage of pages devoted to a total of 130 subjects. Because of the diversity in the extent of articles, it was decided that measuring subject coverage by the number of pages devoted to each subject would be a more accurate assessment of how much is written about a topic. The twenty-five most popular subjects are indicated in table 11. Cataloging, automation, management, and library and information science education head the list. This supports, in part, Atkins' major study of subject trends[46] which determined that management, information retrieval, databases,

TABLE 10
DISTRIBUTION OF RESEARCH-BASED ARTICLES BY JOURNAL IN RANK ORDER

Journal	No.	%
Journal of Amer. Soc. for Inf. Science	61	12.2
College & Research Libraries	57	11.4
Journal of Academic Librarianship	45	9.0
Library & Information Science Research	41	8.2
Libraries and Culture	36	7.2
Library Trends	35	7.0
RQ	35	7.0
Information Technology & Libraries	31	6.2
Serials Librarian	31	6.2
Journal of Ed. for Lib. & Inf. Science	29	5.8
Library Quarterly	27	5.4
Library Resources & Tech. Services	24	4.8
School Library Media Quarterly	18	3.6
Public Library Quarterly	12	2.4
Special Libraries	10	2.0
Journal of Library Administration	8	1.6
Total	500	100.00

TABLE 11
DISTRIBUTION OF COVERAGE BY TWENTY-FIVE MOST POPULAR SUBJECTS AND OTHER MAJOR CATEGORIES BY PAGES

Rank	Content	Coverage in Pages	%
1	Cataloging	719	4.24
2	Automation	686	4.04
3	Management/Personnel	544	3.21
4	Lib. and Inf. Sci. Ed.	538	3.17
5	Comparative Librarianship	472	2.78
6	Collection Management	443	2.61
7	Reference Service	413	2.43
8	Networks/Networking	393	2.32
9	Online Public Access Catalogs	385	2.27
10	Professional Associations	376	2.21
11	Users	365	2.15
12	Information Retrieval	313	1.84
13	Serials Control	300	1.77
14	Children's and Young Adult Services	291	1.72
15	Escalating Costs (Serials, etc.)	268	1.58
16	Research	266	1.57
17	Change/Futures	258	1.52
18	Bibliographic Instruction	235	1.39
19	Special Collections	235	1.39
20	History	224	1.32
21	Reference Sources	223	1.31
22	Indexing	217	1.28
23	Buildings	210	1.24
24	CD-ROMs	182	1.07
25	Cooperation	176	1.04
Total Most Popular Subjects		8,732	51.47
All Other Subjects (105)		5,306	31.27
Reviews		1,672	9.86
Subject Bibliographies		869	5.12
News/Announcements		222	1.31
Editorials/Letters to editor		165	.97
Total All Categories		16,966	100.00

and cataloging were the most popular. However, Atkins perceived that management and cataloging were slowly declining, while articles of a technological nature had almost tripled in frequency. Fifteen of the twenty-five subjects most popular in the current study also appear on a comparable list in the Atkins' study. While Feehan et al.[47] found that as much as 28.5% of their sample dealt with automation, this is not the case in the present study. However, if all automation-related topics are combined, close to 20% is obtained. For example, automation could also be considered as a secondary subject because it is so closely associated with cataloging, online reference service, networks/networking, online public access catalogs, information retrieval, change/futures, reference sources, indexing, CD-ROMs, and cooperation. Automation, as a subject, appears in twelve of the sixteen journals, as do cataloging and management. While collection management does not receive as much page coverage, it does appear as a subject in thirteen of the sixteen journals. This is not surprising in light of continued rapid technological change and the need to disseminate information about new innovative procedures and techniques.

In answer to whether there are any subjects which men tend to write about more than women, or vice versa, the subjects in table 12 represent the greatest disparity between the two sexes. The primary differences, not unexpectedly, are in the heavy coverage by female authors of children's and young adults' services (90.91%) and bibliographic instruction (83.67%). A large share of female authors (78.95%) also write about library standards. Men dominate in doc-

TABLE 12
SUBJECTS WITH DIFFERENTIAL COVERAGE BY AUTHOR GENDER

Subject	Males	%	Females	%	Total Authors	%
Automation	43	40.57	63	59.43	106	100
Bibliog. Inst.	8	16.33	41	83.67	49	100
Bibliog., Subject	21	33.87	41	66.13	62	100
Bibliometrics	15	60.00	10	40.00	25	100
Cataloging	34	43.04	45	56.96	79	100
Child./YA Serv.	1	9.09	10	90.91	11	100
International Libr.	25	75.76	8	24.24	33	100
Continuing Ed.	5	27.78	13	72.22	18	100
Costs	24	72.73	9	27.27	33	100
Document Retrieval	9	100.00	0	00.00	9	100
Library History	10	83.33	2	16.67	12	100
Info. Retrieval	39	69.64	17	30.36	56	100
Lib. and Inf. Sci. Ed.	32	36.78	55	63.22	87	100
Research	32	64.00	28	36.00	50	100
Prof. Assns.	16	34.78	30	65.22	46	100
Serials Control	10	27.78	26	72.28	36	100
OPACS	16	32.00	34	68.00	50	100
Standards	4	21.05	15	78.95	19	100

ument retrieval (100%), library history (83.33%), and international librarianship (75.76%).

In analyzing subject coverage by occupation there are no surprises with respect to typical occupations of the authors. Directors frequently write about management and networking. Reference department heads and reference librarians write about reference service and bibliographic instruction, while technical services librarians and department heads comprise the largest category of writers on cataloging. Systems librarians and managers write about automation—specifically cataloging, CD-ROMs, and circulation. Library and information science deans write about the image of librarians and about library and information science education, which is also covered by faculty members. In analyzing individual journals for popular subjects, articles related to public services (including access to the online catalog) are well represented in *College & Research Libraries*. Coverage of public services is also prevalent in *Journal of Academic Librarianship*, closely followed by content related to management. As expected, the *Journal of the American Society for Information Science* is heavily weighted with content devoted to information retrieval; the *Journal of Education for Library and Information Science* emphasizes education in the field, and the *Journal of Library Administration* is strong in coverage of management issues.

The primary differences, not unexpectedly, are in the heavy coverage by female authors of children's and young adult's services (90.91%) and bibliographic instruction (83.33%).

The extensive international coverage of *Libraries and Culture* is clearly demonstrated by 326 pages devoted to comparative and international librarianship, followed by a large number of historical studies. User studies constitute the major group of subjects treated in *Library and Information Science Research*; management and personnel are the most prevalent topics in *Library Quarterly*, followed closely by library and information science education. Also not surprising is the dominance of cataloging in *Library Resources & Technical Services*, public libraries in *Public Library Quarterly*, and reference service and reference questions in *RQ*. Most subject coverage in *Li-*

brary Trends pertains to library buildings, which can be attributed to a single-theme issue with a large number of articles devoted to that topic. While the *School Library Media Quarterly* and *Special Libraries* contain a majority of items devoted to professional associations, the next largest areas of coverage in each are school librarianship and management, respectively. In *Serials Librarian*, cataloging and serials control and management are almost equally matched in coverage.

Some subjects appear in a majority (nine or more) of the journals: automation, cataloging, children's and young adult services, circulation, collection management, comparative and international librarianship, cooperation, library and information science education, library and information science periodicals, research, management/personnel, networks/networking, online public access catalogs, and professional associations.

CONCLUSIONS

In summary, major findings indicate that males and females tend to publish about an equal number of articles and about an equal percentage of research-based articles in the library periodical literature. The present study confirms a slowly closing gap between the proportions of male and female contributors, particularly among special librarians, although female authors are still poorly represented in SLA. Are women publishing more because in recent years they have filled more positions as heads of organizations, or because they feel more autonomy in their jobs due to increased participatory management? While findings indicate an increase in women authors in each of the journals, the real difference can also be attributed to the wider selection of journal titles and, particularly, the inclusion of those covering aspects of librarianship clearly dominated by females, e.g., *School Library Media Quarterly*, and *Library Resources & Technical Services*. However, as Olsgaard noted, data compiled by the National Center for Educational Statistics indicate that the proportion of women in librarianship in general is about 84%,[48]—much higher than that of men. Data compiled by the American Library Association indicate that this breakdown (in academic and public libraries) is about 75% female and 25% male.[49] In the present study, males published about 2.7 times more than females; therefore, a much larger percentage of males than females are publishing, in spite of the fact that this gap seems to be closing, however slowly. These findings suggest the need for further research into possible explanations for this discrepancy, including women's attitudes toward publishing or their desires to make career advancements and assume more responsible positions. Men and women on library school faculties tend to publish on a more comparable basis.

The major share of publication activity (more than 61%) is accounted for by academic librarians (37.68%, which is greater than their representation in the overall population of either professional or all academic librarians)[50] and library and information science faculty (18.69% or 21.81% including school deans), closely approximating previous findings.[51] While full professors publish the most, an almost equally large number of assistant professors are publishing. Because most faculty members aspiring to tenure are probably assistant professors, their higher publishing rate can be attributed to this need for career advancement and security, including the possibility of spin-off articles from dissertations. Academic librarians are publishing more compared to previous studies, supporting the suggestion that the increase in the percentage of rank and file librarians as compared to the early dominance of library administrators[52] is due to a larger number of academic librarians who have attained positions with faculty status and increased expectations for research and publication. The trend toward these new requirements was noted as early as 1980.[53] On the other hand, Rayman and Goudy found that only 15% of ARL librarians surveyed responded that publication

was essential.[54] Other factors include the likelihood that academic institutions are incorporating thrusts for research in their mission statements, as well as the possibility that the general emphasis on participative management styles has heightened librarians' sense of professionalism and responsibility for contributing to the development of the field. Although there are many more academic librarians than library science faculty, the latter publish a larger percentage of articles, a finding which is not too surprising because more rigorous publication requirements are made of them for promotion and tenure. The rate of publishing by graduate students has remained relatively consistent over the last thirty years.[55] Although it might be hypothesized that this would increase with new emphases on research, new technological tools to facilitate research, and more courses that address quantitative analysis and methodology, a possible explanation for this stable publication rate is the graduate student's motivation to finish their programs and enter the work force before they devote their energies to research and publication.

More authors are located in the Northeast and the Midwest than in any other geographic region, confirming the results of earlier studies. Library schools most productive in terms of publication are at North Carolina and Wisconsin–Madison. Of the sixteen schools identified as most productive in terms of faculty publication, ten are located in either the Northeast or the Midwest, where there are sixteen and thirteen schools, respectively. With a large share of academic librarians in the major academic institutions also located in the Northeast and the Midwest, it is not surprising to find that these two geographic regions rank first and second. There is a 67% overlap with schools that Watson found most productive, the difference possibly due to the inclusion of editorials, regularly appearing columns, and other types of materials in the present study.

Research-based articles are on the increase, although they did decline after a peak of 35% in the late 1970s.[56,57] That this decline occurred commensurate with a decline in federal and other sources of research funding may explain this peak and slump, followed by a moderate upward trend as scholars identified new ways to finance research. Both sexes write nearly equal percentages of research and nonresearch articles.

The general emphasis on participative management styles has heightened librarians' sense of professionalism and responsibility for contributing to the development of the field.

Atkins claims that "a study of subject trends in library and information science publishing is a way for the library profession to learn more about itself."[58] A fair amount of subject coverage overlaps with previous studies. Recent popular topics are library and information science education, online public access catalogs, CD-ROM, bibliographic instruction, children's and young adults' services, and literature dealing with future change. While authors' interest in writing about information retrieval has declined somewhat, the subjects of automation, management, and cataloging continue to occupy the minds of contributing authors and, of course, editors. Continued interest in automation is predictable in light of ongoing technological innovations and the filtering down of automation to smaller libraries. Attention to human relations skills and management is also understandable as libraries are moving toward more participative decision-making and less hierarchical structure. The reasons for the continued increase in cataloging articles are less clear, but possibly due to the increase in publishing by rank and file practitioners, and the trend toward merging, or at least softening, the distinction between the traditional divisions of public and technical services.

Is this an indication that librarianship is moving beyond an interest in immediate problems of the job at hand, and another positive sign of a maturing profession?

With catalogers being moved to public services areas and tending to perform all activities, professional or otherwise, at one subject or branch location, they have now become involved with the online public access catalog. Reference librarians, likewise, are providing input into more adequate online subject access, a continued concern for catalogers. Increased attention to international librarianship (ranked in fifth place) confirmed the Atkins study. Is this an indication that librarianship is moving beyond an interest in immediate problems of the job at hand, and another positive sign of a maturing profession?

Periodic analysis of the subject content of library literature and its authors seems particularly important not only because it documents the historical development of librarianship, but also because it reflects trends in the concerns and issues that concern and confront library and information science educators and practitioners.

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Elements of the Bibliographic Record Used by Reference Staff Members at Three ARL Academic Libraries

Jon R. Hufford

This study determined the extent to which elements of a bibliographic record were consulted by reference staff members of three ARL libraries. It answered the following research questions: (1) For what purposes do reference staff use the catalog and/or database of a bibliographic utility? (2) Are the majority of catalog and utility database searches by the staff for known items? (3) Do the staff members use the author's name as the first access point more often than other access points? and (4) What is the incidence of use of each element of the record? The study raises the question of whether catalog and database use ought to play a part in cataloging theory and practice.

Improvements and changes in computer hardware and software affecting library online public access catalogs are expected to occur on a continuous basis for a number of years. While some variety exists in the structures of the presently existing online catalogs and the formats of their bibliographic records, greater variety will exist in the years to come as still more libraries install them. The potentialities the new computer technology offers for improving library OPACs have led some to conclude that this is an appropriate time to rethink the structure of catalogs. This rethinking should encompass both an empirical and a cumulative process, whose findings should be taken into account when librarians ultimately formulate a new cataloging code.

An important prerequisite of this restructuring process should be the collection of information on how existing catalogs are being used, how successfully they are used, what their limitations are, and what problems these limitations present to users of all types, including library staff members. Empirical catalog use studies that ascertain users' needs and behavior patterns when consulting catalogs and bibliographic utility databases provide this information. No evidence that previous catalog use studies ever influenced cataloging codes exists.

What is needed, according to Elaine Svenonius and Alan Seal, is a process of reexamination that focuses on answering such questions as:

What elements of description should be included in the record or records for each item, and how should they be arranged?

- What are to be the access points of these records?
- How should catalogs be arranged?
- How should codes be arranged?
- What should be the relationship between the organization and content of the catalog and catalog use? and
- What should be the relationship between cataloging codes and catalog use?[1]

Some of these questions have already been examined. For example, evidence

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drawn from empirical research has indicated what access points are needed and that library patrons are predominantly interested in only five elements of the bibliographic record: the author, title, subject headings, date of publication, and call number.[2] However, the findings of most previous catalog use studies relate only to library patrons because these studies concentrated on use by patrons. The searching habits of all catalog user groups, including library staff members, should be studied. (In addition, a look at bibliographic record use may add to knowledge about problems with the quality of reference service.)

Undoubtedly, most librarians believe that major changes in cataloging practice are not likely to take place in the foreseeable future and that bibliographic records should be comprehensive. These librarians may argue that the records should be comprehensive because they are consulted at different kinds of libraries by many groups who use the records for different purposes. Other librarians may think that complete bibliographic records are necessary, if only for archival purposes. The rethinking process discussed in this study, which proposes that catalog and database use ought to play a part in the development of cataloging theory and practice, may seem out of step with these opinions. The foreseeable future has no incongruity. However, the rethinking process should occur over a lengthy period of time, perhaps decades, during which changes in cataloging practice, whether planned or otherwise, will most likely occur, despite what librarians may think now.

AIM AND SCOPE

This study investigated bibliographic record data elements which were sought in in-house catalogs and bibliographic utility databases, focusing on certain aspects of the proposed reexamination process and on a user group previously neglected by use studies. It covered one group of professional librarians and their supporting staff, all members of central reference departments of three academic institutions belonging to the Association of Research Libraries. The study was descriptive and quantitative in nature and not evaluative, and the findings apply only to the libraries studied. However, despite the former attribute, the findings may evoke judgments relating to quality of service performed by staff participating in the study. No attempt is made to determine or define the relative value of bibliographic elements, though use of elements by reference staff may indicate value. However, perceptions of the relative value of the elements as defined or implied in catalog codes, statements in the professional literature, or cataloging practice may affect the results of this descriptive study.

ARL libraries were selected because use of bibliographic elements would be heavier at these libraries than at other kinds of libraries. Reference department staff members were chosen for study because they often consult catalogs when assisting library patrons and when performing other tasks. The main libraries at Rutgers (the State University of New Jersey), New York University, and the State University of New York at Stony Brook were selected. Rutgers does not have a central library. Instead, the collections are dispersed among a number of libraries on several campuses. Two of the largest are Archibald Stevens Alexander Library, which houses the collections for the Humanities and the Social Sciences on the main campus at New Brunswick, and the Library of Science and Medicine on the Busch campus at Piscataway. Their reference departments combined together are comparable to the central reference departments at either Elmer Holmes Bobst Library at New York University or Frank Melville, Jr. Memorial Library at Stony Brook. Therefore, Alexander Library and the Library of Science and Medicine were treated as one central reference department. All three universities have small satellite departmental libraries that were not included in the study.

Various types of catalogs, whose records were arranged in a number of different ways, were consulted by partici-

pants in the study. In addition to the more common card catalogs, microform catalogs, book catalogs, and serials lists, the reference departments also had access to bibliographic utilities. The Bobst Library at New York University had a fully operational online catalog. This variety was expected to affect to some extent the study's findings, especially those concerned with use of access points. But the effect on use of most bibliographic elements (and thus on most of the findings) should be negligible because the records in all these catalogs and databases were created using standard codes. The catalogs are, therefore, similar in the kinds of elements contained. Twenty-two catalogs and bibliographic utilities were included in the study.

The study was designed to answer the following research questions:

1. For what purposes do reference staff members use the catalog and/or database of a bibliographic utility?[3]
2. Are the majority of catalog and bibliographic utility database searches by the reference staff members participating in this study for known items?
3. Do the reference staff members use the author's name (whether personal or corporate) as the first access point more often than other access points?[4]
4. What is the incidence of use of each element of the bibliographic record?

Though the findings apply only to the four libraries studied and, thus, define only a small part of the overall picture, they are suggestive for the field as a whole. The findings may also suggest strengths and/or shortcomings in reference service at the four libraries.

The study also raises the question of whether there should be a relationship between the findings obtained from catalog use studies and the arrangement and composition of catalogs, catalog codes, and bibliographic records. Perhaps extent of use of a given bibliographic element is not a sufficient reason for its inclusion or exclusion from the code and the records created using that code. The idea that there should be such a relationship, however, is not new.[5]

METHODOLOGY

Scripted interviews were selected as the means of collecting the data. The intention was to conduct an equal, or nearly equal, number of interviews at each of the libraries over a relatively long period of time. Six specific hours of each day were set aside for interviewing at each library (two in the morning, two in the afternoon, and two in the evening). A goal was to conduct four interviews each hour, roughly one every fifteen minutes. The interviewer attempted to be as unobtrusive as possible and strove for accuracy when recording the data. The entire study population of seventy-four staff members participated in the interviewing. A period including a major portion of the Fall and Spring terms of the 1984/85 academic year yielded data on all normal catalog activities, providing an accurate description of the departments' searching practices. That the search activities recorded would prevail during any period of time is a reasonable assumption.[6]

Evaluation of the Study

The interview schedule developed and employed for the study was a successful instrument for gathering the data. The procedure followed during interviewing—including use of a script, striving for accuracy, aiming for a specific number of interviews during each hour, attempting unobtrusiveness, and spending an equal amount of time at each library—facilitated the accumulation of an unbiased sample of interviews.

Achieving an even distribution of the interviews among all the participating reference staff members was difficult because some members spent much more time at the reference desk and did more searches than others. In addition, some reference staff members were much more eager to do searches while others avoided searching, doing so only when necessary. More searching was done at one or two of the libraries than at the

rest. Although these factors have a direct affect on the findings, they do not invalidate the study. The study's data clearly represent the searching done in the catalogs and bibliographic utility databases of the libraries during the period of the study.

FINDINGS

For the purposes of this study, the investigator analyzed the data gathered from 1,721 separate searches. Of the total, 515 occurred at Frank Melville, Jr. Library, 622 at Elmer Holmes Bobst Library, 354 at Archibald Stevens Alexander Library, and 230 at Rutgers' Library of Science and Medicine. The total number of searches for the two Rutgers libraries, 584, is roughly comparable to those of the two other libraries in the study: 29.9% of the total came from Melville Library, 36.1% from Bobst Library, and 34% from the two Rutgers libraries.

The sums of searches attributable to individual staff persons ranged from one to 139 per staff member. This disparity in numbers affected the study's findings. Some staff members influenced the findings significantly, others very little.

Research Question: For What Purposes Do Reference Staff Members Use the Catalog and/or Database of a Bibliographic Utility?

Analysis disclosed that the reference staff members used catalogs and bibliographic utility databases for many purposes (see table 1). Those most often cited were to assist patrons working on course papers, to assist patrons interested in finding something to read for enjoyment or edification, to locate information needed for interlibrary loan transactions, to locate information used in the collection development process, to assist patrons with classroom reading assignments, and to assist patrons working on theses. All were predictable reasons for searching catalogs and databases in academic research libraries.

Research Question: Are the Majority of Catalog and Bibliographic Utility Database Searches by the Reference Staff Members Participating in this Study for Known Items?

TABLE 1
INCIDENCE OF USE OF EACH PURPOSE IN RANKED ORDER OF FREQUENCY

Purpose of the Search	No. of Uses	% of Total Number of Uses
1. Patron working on course paper	446	25.9
2. Patron interested in finding something to read for enjoyment or edification	431	25.0
3. Interlibrary loan transaction	227	13.2
4. Collection development by staff member	146	8.5
5. Patron with classroom reading assignment	124	7.2
6. Information needed by patron for thesis	89	5.2
7. Catalog maintenance by staff member	52	3.0
8. Patron needing information for work to be published	44	2.6
9. Professional curiosity on the part of staff member	33	1.9
10. Patron seeking job-related information	33	1.9
11. Professor preparing for teaching	31	1.8
12. Staff member compiling bibliography	21	1.2
13. Teaching done by staff member	10	0.6
14. Preparation for oral presentation	8	0.5
15. Collection maintenance by staff member	8	0.5
16. Staff member seeking information for work to be published	5	0.3
17. Patron with class film project	5	0.3
18. Compiling bibliography for patron	4	0.2
19. Information needed by patron to fill out form (not job-related)	2	0.1
20. Legal research provided to patron	1	0.1
22. Preparation for sermon	1	0.1
Totals	1,721	100.0

In this study a "known item" search is defined as a search whose first access point includes either a name (whether personal or corporate) or title (including a title keyword). Any search whose first

access point does not include a name or title is treated as an "unknown item" search. Names which were searched in the catalog as subject headings are treated as unknown item searches. Of the 1,721 searches undertaken in this study, 1,518 (88%) were known item searches, and 203 (12%) were not known item searches.

However, in recent years some catalog use studies have shown that in an online environment more subject searching seems to be done.

In previous catalog use studies, the evidence had strongly indicated that patrons do more known item searches than unknown item searches. However, in recent years some catalog use studies have shown that in an online environment more subject searching seems to be done.[7] In this study, reference staff members conformed to the general finding of most past studies by doing more known item searches than unknown item searches. Further, the percentage (88.2%) of known item searches was also much greater than in most of the previous studies. Two possible explanations are that the reference staff members were often doing "problem" searches for patrons who frequently had a name and/or title in mind. Reference staff were also frequently doing bibliographic work such as interlibrary loan searching in which the author and/or title were usually available.

Research Question: Do the Reference Staff Members Use the Author's Name (Whether Personal or Corporate) as First Access Point More Often than Other Access Points?

Reference staff consulted a wide range of heading types as the first access point of searches. On the one hand, the title by itself was used 914 times (53.1%). Of these titles, 621 (36.1%) were main entries, and 293 (17%) were added entries. On the other hand, the author's name by itself was resorted to 395 times (22.9%). Boolean author/title combinations used on database terminals were employed as the first access point 115 times (6.6%), while a subject heading or term was used 158 times (9.2%).

A number of earlier studies had disclosed that the author was used most often as the first access point. Recent studies such as the one sponsored by the Council on Library Resources in 1982, however, did not. That study found that subject headings were used more often than author.[8]

Research Question: What is the Incidence of Use of Each Element of the Bibliographic Record?

A total of sixty-three separate bibliographic elements were identified primarily in *Anglo-American Cataloguing Rules*, second edition, with a handful of elements taken from other sources. Incidences of use of added entry access points were not included in this tabulation. Though in a single bibliographic record the elements: "Author" and "Statement of responsibility" may include the same information, they were treated as distinct bibliographic elements. All elements of the bibliographic record may not have equal value, though for many elements there are differing opinions regarding which have more value. Groups of elements serve different functions—one group for reference and retrieval, another for identification and description, and a third for facilitating storage. Some librarians would argue that function affects the value of the elements. Surely, access points used in retrieval are more valuable than many of the descriptive elements. But others would argue that some descriptive elements—the title proper, place, name, and date of publication, and the contents note, to name a few—are also valuable elements, perhaps more so than some access points. In establishing rules, the authors of catalog codes place values on the elements by implication. Code makers may imply further value

when the rule designates the element required, required if available, or optional information in the record. And cataloging practice at the Library of Congress and at libraries participating in the shared cataloging programs of OCLC and RLIN is based to some extent on the principle that some bibliographic elements have more value than others. This descriptive study does not determine which elements have more value than others, except in so far as reference staff use determines value. This study about reference users and past studies on use identify elements that have "use" value to catalog and database patrons. Determining value through use studies can enhance more traditional ways such as by definition or inference in catalog codes or by statement of principles based on theory or professional opinion.

Only a handful of the elements were consulted twenty-one times or more. Most of the rest were not consulted at all or were consulted only a few times. The elements examined more than twenty-one times are listed in table 2.

Thirteen elements, representing 20.6% of all sixty-three elements and accounting for 96.6% of the total number of 4,503 uses of all elements, were used more than twenty-one times; only seven elements, representing 11.1% of all the elements and accounting for 90.7% of the total number of uses of all elements, were used more than 100 times. These figures lead to the conclusion that most bibliographic elements were not used very often. This finding conforms to data produced in all previous studies.

The picture changes somewhat, however, if librarians take into consideration the likelihood of the various elements appearing in the bibliographic record in the first place because the elements must be there to be used. In this study it would have been difficult for the investigator to have noted and recorded the existence or nonexistence of each bibliographic element in the record. And given the variety of rules and cataloging practices reflected in the catalog of a large university library, it would be difficult to reach any quantitative estimate of the probability of each element appearing on the records. Still, the various codes and cataloging practices require certain elements. These elements are "Title proper," "Numeric and/or alphabetic designation (for serials)," "Chronological designation (for serials)," "Place of publication, distribution, etc.," "Date of publication, distribution, etc.," "Extent of item," "Dimensions," "Call number," "Tracing," and "Library or branch library location information."[9]

American Library Association standards require other bibliographic elements if the information is available to the individual cataloging the work, that is, if the work is available for examination by the cataloger. These elements in-

TABLE 2
INCIDENCES OF USE OF BIBLIOGRAPHIC ELEMENTS USED MORE THAN TWENTY-ONE TIMES (IN RANKED ORDER OF FREQUENCY)

Bibliographic Element	No. of Uses	% of all Uses	% of all 1,721 Searches
1. Title proper	1,487	33.0	86.4
2. Author	871	19.3	50.6
3. Library or branch library location information	615	13.7	35.7
4. Call number	594	13.2	34.5
5. Chronological designation (for serials)	259	5.8	15.0
6. Date of publication, distribution, etc.	129	2.9	7.5
7. Numeric and/or alphabetic designation (for serials)	129	2.9	7.5
8. Place of publication, distribution, etc.	72	1.6	4.2
9. Name of publisher, distributor, etc.	71	1.6	4.1
10. Tracing	48	1.1	2.8
11. Other title information	27	0.6	1.6
12. Statement of responsibility	26	0.6	1.5
13. Acquisitions information	22	0.5	1.3
14. Other	153	3.2	8.9
Totals	4,503	100.0	

clude "Author," "General material designation," "Parallel titles," "Other title information," "Statement of responsibility," "Edition statement," "Statements of responsibility relating to the edition," "Subsequent edition statement," "Statements of responsibility relating to a subsequent edition statement," "Statement of scale," "Statement of projection," "Name of publisher, distributor, etc.," "Other physical details," "Accompanying material," "Title proper of series," "ISSN of series," "Numbering within series," "Subseries," "Language of the item and/or translation or adaptation (Note)," "Edition and history (Note)," "Dissertation (Note)," "Contents (Note)," "Standard number," "Key-title," "L.C. Card number," "Circulation information," and "Acquisitions information." Inclusion of the remaining elements in bibliographic records is discretionary, depending on the work, the judgment of the cataloger, or the practice of a particular library.[10]

Therefore, in general, this study's findings on frequency of bibliographic element use correspond to those in past studies.

An examination of the frequencies of use of the bibliographic elements in this context reveals that the elements used most frequently in this study correspond to those that would normally be expected to appear on each record, with the exception of "Extent of item" and "Dimensions." Yet, except for "Title proper," each of the required elements discussed above was consulted in less than 51% of all 1,721 searches observed in the study and accounted for less than 20% of the total of all 4,503 uses of bibliographic elements. The elements "Extent of item" and "Dimensions," which should appear on most, if not all, records, have very low frequencies of use. Except for "Author" and "Name of publisher, distributor, etc.," the elements that would appear in records if the information were available to the cataloger at the time of cataloging were also used infrequently. And, as would be expected, discretionary elements have the lowest frequency of use. Most elements, including those in the discretionary category, probably appear on the bibliographic record more frequently than they were used in the searches observed during this study.

Previous catalog use studies disclosed that the elements "Author," "Title proper," "Call number," and "Date of publication, distribution, etc." were often consulted.[11] All of these elements have been required in bibliographic records for many years. The same elements were also frequently used in this study. Previous studies found that the elements "Place of publication, distribution, etc.," "Name of publisher, distributor, etc.," "Edition statement," and "Contents (Note)" were used less frequently, though more so than many other elements. This particular group of elements comprises information required on bibliographic records if available. Except for "Edition statement" and "Contents (Note)," these elements were consulted moderately often in this study. Other types of data elements such as "Dimensions" and "Illustration statement" were rarely used in previous studies and in the present study. Therefore, in general, this study's findings on frequency of bibliographic element use correspond to those in previous studies. Unlike previous findings, this study showed that the elements "Library or branch library location information," "Chronological designation (for serials)," "Numeric and/or alphabetic designation (for serials)," and "Tracing" were also used frequently.

CONCLUSIONS

This study's main finding was that the reference staff members generally consulted only a limited number of the elements in the bibliographic records examined. A handful of specific kinds of

elements was consulted in a large number of searches. Librarians would perhaps expect most of these elements to be used frequently because their presence is required in records, but other required elements such as "Extent of item" and "Dimensions" were hardly used at all. For reference purposes, this is the expected result. The data implied that the reference staff members more often than not employed their catalogs only as aids for finding items in the collection. Apart from such bibliographic elements as "Author," "Title proper," "Call number," "Library or branch library location information," "Numeric and/or alphabetic designation (for serials)," and "Chronological designation (for serials)," most of the information in the bibliographic record was usually ignored. Reference staff members often did not need to differentiate among editions of the same title, consult notes for a more precise understanding of coverage, determine whether the item was illustrated, or check the title of the series. In general, these findings concur with those of all previous catalog use studies that monitored use of bibliographic elements. The same elements (in particular many of those listed above) tended to be heavily used in all of these studies. In this respect the findings of all the studies were similar.

However, some exceptions to this similarity exist. For example, searches whose purpose was "Collection development by staff member" were frequently associated with a few additional bibliographic elements besides those normally used to identify and find items. These elements were "Place of publication, distribution, etc.," "Name of publisher, distributor, etc.," and "Date of publication, distribution, etc." Though reference staff members doing the searches in this particular category tended to consult a few more elements, the total number of elements consulted was nevertheless restricted to just a few.

Heavy use of bibliographic elements other than those normally consulted to help locate an item was not so apparent in any of the catalog use studies done previously because most of those studies excluded staff members from the population surveyed. While a few did include staff in their study populations, they were a small proportion of the overall study population. For this reason, no separate findings unique to this particular user group were revealed in any of the previous studies.

This study's main finding was that the reference staff members generally consulted only a limited number of the elements in the bibliographic records examined.

This study's finding that reference staff members used only part of the bibliographic record suggests a possibility that these staff members may be neglecting their catalogs' potential for enhancing the quality of service to patrons. Though this study is descriptive and does not measure the quality of reference service, the finding raises the questions as to whether more skilled reference staff members might have made more and better use of all the bibliographic elements. In a recent article published in the *Journal of Academic Librarianship*, Peter Hernon and Charles McClure maintained that "unobtrusive testing conducted over the past two decades" has revealed that "serious problems exist in the quality of reference desk service provided in many academic and public libraries throughout the United States."[12] One general finding derived from all these unobtrusive studies indicated that many reference staff members provide only "half-right" answers to questions. Specifically, Hernon and McClure's analysis of the data related to this general finding revealed that reference staff members in the libraries studied, regardless of level of experience, correctly answered about 55% of the factual and bibliographic questions they received. Perhaps one reason for this was

that they were not providing information that could have been found in bibliographic records. Perhaps the "behavioral" data on catalog consultation that shows low frequency of use of elements reflects insufficient skill, ignorance of the potential of the bibliographic elements in answering questions, lack of time to do thorough bibliographic investigation, or a combination of all three. But, unless and until more specific studies are done on this possible link between catalog use and bibliographic competence, the relationship is suggestive at best. Still, the available data do suggest the need for library administrators and library educators to consider giving more attention to increasing librarians' bibliographic skills as well as their commitment to professional effectiveness.

This study's finding that reference staff members used only part of the bibliographic record suggests a possibility that these staff members may be neglecting their catalogs' potential for enhancing the quality of service to patrons.

Another implication relates to the nature of the online catalog systems being used or developed at the four libraries studied and, by extension, to other university libraries. The information provided by this study and other catalog use studies may be helpful in planning and developing these online catalog systems. The libraries undoubtedly recognize the need for full bibliographic records. Library staff such as acquisitions, collection development, and catalog librarians should consult these complete records in the course of their work. The developers of the public user interface portion of the libraries' online catalogs may, however, want to include only a brief display, with a limited number of specified bibliographic elements derived from the full record. The findings of this present study and those of other catalog use studies can help these individuals determine which elements to include in this brief display. The entries could include minimal cataloging information whose main purpose would be to help patrons and reference staff members locate items in the collection. Some libraries have done this already.[13]

Although in a scientific sense it cannot be argued that the findings of this study represent what is happening at other academic research libraries across the country, the findings do indicate what may be happening in some of them. If that is the case, then the option of referring to the findings of this and other catalog use studies when planning and developing the finding list displays of online catalog systems may be applicable in other libraries.

Further Research Needed

This study provided information from four libraries about the catalog and bibliographic utility database use practices of reference staff members, a catalog user group which had not previously been studied. However, the profession needs catalog use studies which concentrate on gathering data about the searching practices of library staff members from all departments in many libraries. And studies with the combined goals and methodologies for determining catalog use and measuring the quality and effectiveness of bibliographic searching in the course of providing reference service to patrons may yield a still more sophisticated understanding of use and potential use of bibliographic information. These particular studies should explore such issues as whether better use of bibliographic elements improves reference service. The data should be collected in such a way that comparison of use practices among the various departments of a library and among libraries is possible. Comprehensive, empirical survey studies which investigate catalog use by staff in many libraries would be particularly desirable, though such studies are difficult to accomplish.

The reason for conducting these stud-

ies is to learn more about how library personnel consult catalogs and bibliographic utility databases. Once this knowledge becomes available, it should be compared with what is already known about patron use. In the future, all of this information could then be consulted whenever professional librarians consider revising cataloging codes, public catalog arrangements, and/or the content of bibliographic records. The main purpose of catalogs and bibliographic utility databases is to serve as indexes to the holdings of libraries. As such, they exist for consultation by various user groups. Thus, catalog and database use ought to play a part in the development of cataloging theory and practice. Knowledge of use can contribute an important empirical base for cataloging.

The reason for conducting these studies is to learn more about how library personnel consult catalogs and bibliographic utility databases.

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Subject Enhancement: Report on an Experiment

Gunnar Knutson

This report describes an experiment in subject enhancement conducted at an academic research library. Subjects and contents notes were added to online catalog records for a group of previously uncirculated social science essay collections, and circulation was monitored over one academic year. A control group, plus a third group with added contents notes but no extra subjects, were also monitored. Results showed an improvement in recorded use for the subject-enhanced titles, but not for titles that only had added contents notes. The effects of browsing, keyword searching, and OPAC display are discussed, and suggestions made for further research in this area.

Providing better subject access to collections is an important issue to research libraries. This report describes a one-year experiment designed to determine whether adding a substantial number of controlled vocabulary subject headings will raise circulation rates. The effects of added contents notes, keyword searching, and browsing are also examined. Benefits of increased subject access are presented and discussed, and further research in related areas is suggested.

This project addresses two basic questions. First, can changes in subject cataloging policy improve the likelihood that some unused or little used materials in research collections will circulate? Second, is there a particular type of improvement that can be demonstrated as suitable for this purpose?

One way to view the overall problem is to consider whether the lack of recorded use of large parts of a research collection may reflect deficiencies in the current level of subject cataloging. Do research libraries really contain many thousands of books which do not circulate simply because patrons do not have good access to their subject matter, or is the frequency of book circulation basically unrelated to the catalog record?

These are questions which confront librarians concerned with improving access while working within budget constraints. The online catalog makes it possible to consider a wide range of potential improvements, yet too little is known of the effects of such changes. They may be only "improved means to an unimproved end," as Thoreau once described technological progress. Today we might ask if changes to the catalog record will actually result in increased use of library materials, or whether, despite better bibliographic access, users will still choose more or less the same titles and leave the same large percentage of the collection uncirculated.

LITERATURE REVIEW

Insufficient subject access in standard cataloging has become almost a truism in the critical literature. The average number of Library of Congress subject headings on OCLC MARC records has been estimated at about 1.4, though this varies somewhat by classification and may have increased in recent years.[1] (The author noted an average of about 2.6 subjects per record for social science titles in the current study, compared to

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1.8 for similar titles in the above mentioned study.) James R. Dwyer summarized the problem by stating that "our clients are requesting not just more and better subject access, but a deeper analysis of the contents of library materials.[2]

Two books appearing in the late 1970s—only one of which dealt directly with subject access—serve as contrasting viewpoints on the overall question of the relationship between the catalog and book use. *Use of Library Materials* (often referred to as the Pittsburgh study) analyzed automated circulation data to show how, over a long period of time, a large portion of a research collection is unlikely to have any recorded use.[3] Though much of the data was consistent with other studies, the report generated a great deal of controversy for its methodology and conclusions. Some critics argued that the study showed little understanding of the special nature of research collections, and they defended low recorded use as unimportant to the mission of academic research.

We know that in large academic libraries many books seldom, if ever, circulate. We suspect that this is partly due to inadequate subject access.

The closing chapter of the Pittsburgh study acknowledges that cataloging improvements might affect circulation rates, but this statement is peripheral to the overall message that "only 56% to 60% of the books and monographs added to the collection in any one year ever circulate."[4] The main thrust of the study is that nonuse of books is more a problem of book selection than of cataloging.

Pauline Atherton presented a contrasting viewpoint in the *Books are for Use* report. That report saw nonuse of books as primarily a subject catalog failure: "Our investment in books is partially wasted and underused if access is only available to those who come to the library catalog to search for known items."[5] Atherton's approach was to augment a test file of MARC records with subject descriptors taken from the books, providing greater online accessibility through free-text searching. The experiment reported encouraging progress in improving subject access, though it was not designed to measure changes in circulation patterns in research collections. A recent project at the Australian Defence Force Academy Library, using the same technique, had similar findings of better retrieval but also does not report on how book use was affected.[6]

Other research demonstrates the difficulty of linking book use to the fullness of the bibliographic record. At times it appears that the standard catalog record is all but irrelevant, as in William Aguilar's experiment.[7] Aguilar removed catalog cards for a sample of books in a small public library and found that circulation was not affected. Margaret Ann Thomas Taylor[8] found no consistent positive correlation between depth of existing cataloging and book use in a larger public library, while similar results were reported in two different university settings.[9,10]

The contradictions of this situation can be appreciated by a summary of the various research. We know that in large academic libraries many books seldom, if ever, circulate. We suspect that this is partly due to inadequate subject access, yet the presence of more LC subjects seemingly has no link to higher circulation. A different approach to subject cataloging may be necessary, but too little is known of what such changes should be, or of probable user reaction. Also, as Carol A. Mandel and Judith Herschman point out, libraries have an "enormous investment" in the traditional LC subject system.[11] Libraries are not likely simply to abandon LC subjects as a means of access. Part of the challenge facing research libraries is to find ways to modify current subject cataloging practices so that materials are more accessible to users.

In a previous research report involv-

ing statistical tests of average numbers of subjects compared to circulations, the author concluded "that merely increasing the number of LC subject headings may have little or no measurable effect on book retrieval and use." This finding was qualified by the acknowledged possibility that "an incremental increase in subject headings, such as from one or two up to three or four, is not significantly associated with circulation, but that a very large increase up to perhaps ten or more—which would also allow access to subsets of information in monographs—may show an association with use figures."[12]

William Carl Highfill earlier demonstrated that "those books which have been assigned a greater number of subject headings have a greater chance of being selected by catalog users during subject searches."[13] Although that experiment did not measure book circulation, it is a logical assumption that a number of the subjects selected in catalog searches will lead to book uses. Highfill suggested that "to increase the retrieval potential of the subject catalog, the number of access points per document should be increased."[14]

All of these studies argue the importance of attempting to demonstrate an actual increase in collection use based on a new approach to subject cataloging. An important point is that, in current cataloging, marginal differences in the number of controlled subjects per record most often reflect the attempt of a cataloging agency to provide standard levels of access. This may be one, two, or several subjects—however many are needed to provide a general subject summary of the contents of a work.

It is not the practice of the Library of Congress or of most other libraries to provide enough subjects for chapter level access to most works. The very real economic consideration of a known cost and the not well known benefits of increasing the level of subject analysis prevents libraries from making a sharp break with tradition in subject cataloging.

The practice of summarizing subject content rather than trying to describe each part may be why the few attempts to show a positive correlation between numbers of subjects and use of books have proved futile. If, roughly speaking, the current system provides an adequate *general* description of subject matter, there should be little relative difference in use of books whether they have one or several subjects. By going to the chapter level, however, it may be possible both to improve retrieval and to increase the likelihood of circulation.

Keyword searching is one way of potentially getting to more specific subject matter within a book. As noted above, Atherton and subsequent researchers have demonstrated that users can be more successful in matching terms through keyword searching than by traditional controlled vocabulary subject searches. However, keyword searching is not universally available on library catalogs, nor is it without limitations. Such searches may retrieve a mass of information that is difficult to sort through, and some keywords will not reflect the true subject matter being sought. Response time may also be slow. Keyword searching is an important advance but is not the *only* method to consider for catalog improvements.

Several years ago Mandel concluded a review on methods of improving subject access by asking, "Should we enhance the MARC record to improve subject access?" and stated, "We won't know until we try."[15] She noted that LC was not likely to alter its cataloging policies without good reason, and that "the hard research evidence needed to make such a case for enriched MARC records does not yet exist."[16] Recent research such as the Australian experiment mentioned above, Karen Markey and Karen Calhoun's demonstration of the value of adding content-rich terms to records,[17] and the OCLC test database with added tables of contents and abstracts,[18] address some of the possibilities.

One of the options listed by Mandel was additional LCSH controlled vocabulary indexing ("the most labor-intensive option").[19] The current experiment is an

attempt to implement a version of this approach on a subset of materials in one academic library.

METHODOLOGY

The study took place at the Main Library of the University of Illinois at Chicago (UIC). This library holds over 600,000 titles in open stacks. Principal access is provided by a NOTIS-based online public catalog (LUIS). In addition, circulation information for this and other Illinois libraries is available on LCS terminals. (In mid–1988 the LCS catalog was expanded to provide a full bibliographic record via Illinet Online (IO).) The card catalog at the study library was still in place during the experiment but had been frozen since the end of 1985. (The online LUIS catalog has records for all books cataloged since 1977, plus most earlier titles. An estimated 10% of the collection was not converted as of the 1988/89 academic year.)

At the time of the study, patron use was heavily weighted toward LUIS because it was the most current catalog, the easiest to use, and was available on many terminals throughout the library as well as through the university's extensive computer network. The card catalog no longer had records for current acquisitions and was not heavily used, while the LCS/IO system was used primarily to check circulation data and for resource sharing.

The author decided to conduct the experiment through the LUIS catalog, based on circulation of books in the regular collection. A separate data file might have been used instead, but that would not have addressed the question of whether subject enhancements added to a large existing catalog could have a positive effect on book use.

Circulation was chosen as the measure of use. Larry Hardesty notes that "recorded circulation is a good indicator of the total use of books."[20] In-house use may vary somewhat, but it follows the same general pattern as recorded circulation.

Selecting a suitable group of books to enhance involved three stages. The author chose to concentrate on a single area—the Library of Congress H classification, which covers a broad range of social science material. In order to learn more about circulation patterns and their effect on this experiment, the author examined a sample of UIC social science holdings and compared the findings to data from the Pittsburgh study on book use. Because the current study focused only on the high-use social science classification and did not include multiple copy or volume items, while the Pittsburgh study reported total circulation, only a general comparison could be made.

The comprehensive Pittsburgh data showed that books were most likely to circulate for the first time within the first two years after being added to the collection. Beginning in the third year after cataloging, recorded first-time use dropped sharply and steadily. After six years, about 60% of the titles had one or more recorded circulations, and this figure increased only at a very gradual rate in subsequent years.[21]

A sample list of 372 titles added to the UIC Library's social science collection in 1981 was available from a previous project. After six years, 334 of the titles could be accounted for by a shelf check or were currently checked out. Of these, 244 (73%) had circulated at least once. Most of the books had been checked out initially in the first or second calendar year in the collection. Although the use rate was considerably higher than the overall figure in the Pittsburgh study, there was a significant group of uncirculated items even in this high-use area. The author examined these ninety uncirculated books and considered them for subject enhancement potential.

Examination of the uncirculated 1981 social science titles was revealing and helped shape the experiment. As a group, these books were not good candidates for subject enhancement. Too many were on narrow topics that were well covered by their existing subjects. The passage of six years had left a disproportionate number of highly specialized titles that seemed unlikely to circu-

late often regardless of the catalog record. There *were* books whose use might well have been promoted by added subjects, but they were too few to form the basis of a study without taking a very large sample of books this old.

Previously circulated books could have been used, but this would introduce an unwanted complication because it is obvious that certain popular titles will be in almost constant use regardless of the catalog record.

Adding more subjects when cataloging new books was another possibility, but this seemed undesirable for several reasons. A number of works are special ordered for patrons and thus circulate for the first time without the influence of the catalog record. Newly cataloged titles also appear on monthly book lists sent to all university departments as well as to interested faculty. These lists are posted near the circulation desk, where dust jackets for some new books are also displayed. Another problem is that library staff may request a new book as it is being processed. It seemed best to eliminate as many of these extraneous influences on book use as possible.

Based on what was learned from this preliminary work, the author concluded that the research sample should be chosen from books that had been in the collection for two or three years, thus increasing the likelihood that patrons would use the catalog to locate a title. Using 1986 as the base year simplified the process because new subjects only had to be added to the online catalog (the card catalog having been closed in 1985). Accordingly, a 685-record sample of 1986 social science acquisitions was taken. About 57% of the books which could be accounted for (in December 1987) had circulated at least once since being cataloged.

Although this process provided a wider range of material, the books in the sample which had not circulated (43%) still presented a problem for subject enhancement. Compilations of essays and conference papers within this group were clearly most suitable for the final experiment. While some single-author monographs might also have been suitable, many appeared to be completely described by the general subjects they already had. Eliminating such books would have required subjective judgments that would have biased the experiment. Therefore, the project was limited to essay collections and conference proceedings that had discrete parts to which subject headings could be assigned. Every uncirculated book in these categories could be treated similarly. The author assumed that this would provide a fair test of materials that would be good subject enhancement candidates in any library. Whether other kinds of books would provide similar results was too broad a question to address in this experiment.

The author surveyed new books lists to locate all such essay compilations added to the H classification in 1986, made printouts of the catalog records for appropriate titles, and examined each book. Shelf searches, done in the spring of 1988, showed that 61% of the essay and conference paper collections added in 1986 had circulated at least once. The passage of several months between the survey of general social science books and these compilations would have raised the use rate somewhat, so the figures of 57% use for H class as a whole and 61% use for essay collections after two-plus years in the library are actually quite comparable. This finding—that essay collections did not have a distinct circulation pattern—increased the likelihood that the results of the experiment could have implications for those single-author monographs suitable for subject enhancement.

Subject additions to the catalog records were made at the end of the 1988 summer quarter. At that point there were 291 uncirculated compilations of H classification essays and conference papers which had been cataloged during 1986 and were thus eligible for the project. Some of these records served as a control group, while others received added subjects and a full contents note.

A contents note was added to any record receiving added subjects so that a

user might see that a particular subject often applied only to one or two essays within the book. However, because of the availability of keyword searching in the online public catalog, the presence or absence of contents notes was a potentially confounding factor in interpreting test results. If the group with more subjects circulated more often than the control, this might be linked to keyword searching rather than, or in addition to, the added subjects. Therefore, the 291 records were divided into three groups: an enhance group, with added subjects and contents notes; a control group, with no added subjects or contents notes; and a third group, with no added subjects but with full contents notes. This division would provide some measure of the relative importance of the added subjects as opposed to contents notes in the subsequent use of the books.

Because circulation rates within the H subclass areas varied, the records were put in call number order and systematically assigned to one of the three groups to assure that there was no concentration of records within an area with a potentially higher or lower use rate. An order of one enhance record, followed by one control record, followed by one contents-note-only record, was chosen by lot and followed throughout.

Because these titles represented the entire range of uncirculated books of this type, they were not always ideal for subject enhancement. Some problems encountered involved conference proceedings with large numbers of papers on esoteric topics that do not have exact matches with LC subject terms and essay collections with little range of subject matter. These factors, plus the varying number of subjects already on the records, precluded giving a standard number of added subjects to each record. Nevertheless, every third title received as many new subjects as were practical to assign.

Before the enhancements, the records had an average of about 2.5 LC subjects with a range from one to six. They received an average of five new subjects, giving them an average of 7.5 subjects with a new range of from three to thirteen. This represented an average increase in subject headings of about 200%.

Despite the fact that these were all collections of essays, only thirty-four of the 291 original records had contents notes. In most cases it was necessary to add such notes to the enhance group and the contents note group. In a few cases the contents notes were excessively long, and the author shortened them by abbreviating forenames, leaving off second and third authors, or by limiting them to the first twenty essay titles. In no case was any information justifying an added subject entry left off the contents note.

Most of the work was done during evenings or on weekends when the library was closed so that the books would be off the shelves for as little time as possible (though the data tally did not begin until all preparations were complete). The department's Principal Cataloger checked the initial enhancements to verify that the subjects were appropriate to add within the framework of the project.

Final work was completed before the start of the 1988 fall quarter. Circulation was monitored twice a month on the online LCS circulation system over the course of one academic year, from September 12, 1988, through September 10, 1989. In addition, during the middle of each quarter, the author did a shelf check to identify any missing books or miscellaneous problems. At the conclusion of the project a final shelf check was made, and a printout of circulation figures for the classification over the preceding year was obtained from the LCS office to verify all data.

The combination of regular LCS searching plus the final printouts made it possible to distinguish local from nonlocal uses and to distinguish renewals from separate circulation transactions, thus providing more meaningful data for analysis. Precise data were important because only the local online catalog (LUIS) records had been modified and

because undifferentiated circulation data can be misleading. These practices also made it possible to chart circulation patterns over the academic year. There were still some minor difficulties, however, as discussed in the findings section below.

The main limitation of the experiment was that circulation transactions could not be linked to any prior searching by a specific user at a specific terminal, so that transaction logs might in turn be examined to see what search terms had been used. Given the small number of expected circulations spread over an entire year, it was also impractical to administer a user survey. A survey form might have been inserted in the books, but there seemed no way to assure that response would be meaningfully high, and the presence of an obtrusive form could actually have discouraged some use. Confidentiality issues precluded using circulation records to contact patrons for interviews.

Aware of these limitations, the author did not assume that all the circulations resulted from online subject searches, but given the size of the library and the heavy use of the online public catalog (nearly 3,900,000 separate search transactions over the academic year), the influence of the catalog record should have been considerable. Known-item searches and browsing must have accounted for a portion of the local circulations, but this should have affected all three groups equally.

The null hypothesis of the study was that circulation frequency is independent of variations in the catalog record (namely, the added subject headings and contents notes). Based on earlier research, it seemed unlikely that a pattern of more use for the enhanced records would be found.

FINDINGS

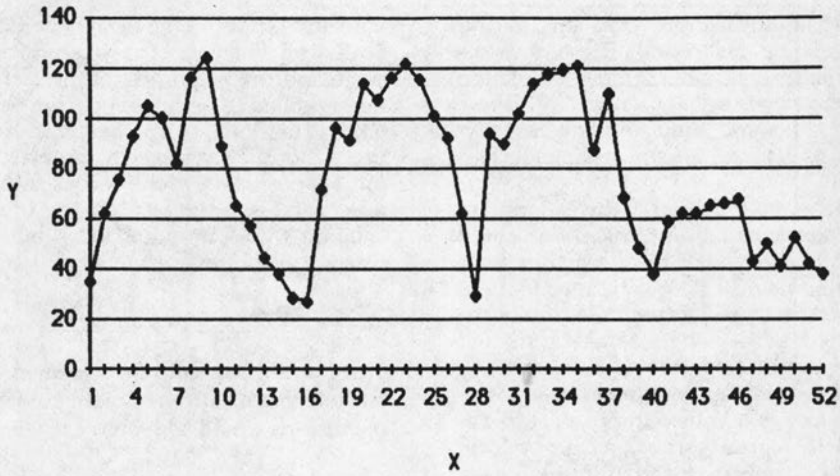
During the year, fifty-seven (19.6%) of the 291 titles circulated at least once. There were ninety-eight total circulation transactions for the experimental group, including renewals and external use. Two problems arose, both in the contents note group. One of the books disappeared between the preparations stage and the beginning of the test period and had to be removed from the final calculations. Also, despite all the precautions taken, one circulation could not be positively identified as local or nonlocal. Because of its brevity, the circulation was counted as local, but this was not absolutely certain.

Based on earlier research, it seemed unlikely that a pattern of more use for the records would be found.

Use figures were analyzed in several ways, including the number of titles circulating locally for the first time, the number of separate local circulations (excluding renewals), the number of total local circulations, and the total number of circulations including interlibrary loan and renewals. Each method gives a somewhat different perspective on book use.

Figures 1 and 2 provide an overview of the year's online public catalog use and the circulation of the experimental books. By comparing the two figures one can see that, in general, circulation of books in the experimental groups follows high and low use periods of the catalog, which in turn closely mirrors the academic year. Public catalog use rises to well over 100,000 transactions per week each quarter, peaks late in the quarter, and then drops sharply around finals. Summer has about half the online catalog activity as other quarters.

Because none of the sample books had a prior circulation history, the experiment provided a ready measure of first time use. The Pittsburgh study demonstrated that such use diminishes with length of time in the collection, and because the titles in the current study were uncirculated after being in the collection for more than two years (on average), the expected circulation rate was not



X axis = weeks of academic year. Week 1 = Sept. 12-18, 1988; week 10 = Nov. 13-19, 1988; week 25 = Feb. 27-March 6, 1989; week 40 = June 12-18, 1989; etc.

Y axis = number of public online catalog transactions, in thousands

FIGURE 1
1988/89 Online Searches

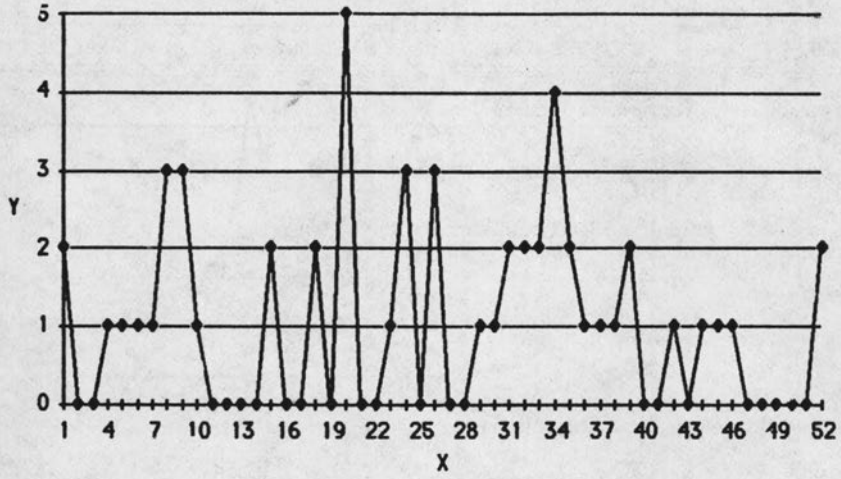
high. As table 1 shows, fifty (17.2%) of the titles circulated locally during the 1988/89 academic year. The enhance group accounted for twenty-three (46%) of these fifty circulating titles, compared to fourteen (28%) for the control and thirteen (26%) for the contents-note-group titles.

These totals were unexpected, given previous studies which had not established a pattern of more use for books with more subject headings. However, the differences were measured by a chi-square test and found not to be statistically significant at the .05 level, despite the considerable variation. A value of 4.30 was obtained on the test, with 5.99 required for .05 significance at two degrees of freedom. Thus, the null hypothesis that circulation frequency is independent of variations in the catalog record was not disproved.

The chi-square test is suitable for data that can be put in one or another cell, as in whether or not a book has circulated, but not for variable data such as comparing multiple circulations of some of the books. Therefore, the remaining statistics are presented without this test.

Another measure of circulation, one which may be most telling regarding the possible effects of an enhanced catalog record, involves the number of separate circulations per title. A book checked out at two different times (thus excluding renewals) is likely a reflection of two distinct catalog searches. Once again the enhance group of books had the highest circulation rate with twenty-six separate local circulations (48.1% of this total), compared to fifteen (27.8%) for the control and thirteen (24.1%) for the contents note group.

This pattern of higher use continued when total local circulations, including renewals, were examined. Renewals do not reflect a reuse of the catalog, and are, therefore, less helpful for interpreting book use than are separate circulations; but they do give some measure of the



X axis = weeks of academic year. Week 1 = Sept. 12-18, 1988; week 10 = Nov. 13-19, 1988; week 25 = Feb. 27-March 6, 1989; week 40 = June 12-18, 1989; etc.

Y axis = number of local circulations per week for books in the sample (renewals excluded)

FIGURE 2
1988/89 Local Circulations of Experimental Group

relevance of books to the user. Renewals are often included in circulation studies as if they were the equivalent of other circulations. In the present study, the enhance group again had the highest total local circulation figures when renewals were added to the figures. Enhanced titles accounted for forty-six such circulations (52.3%), compared to twenty-two (25%) for the control and twenty (22.7%) for the contents note group.

A final set of figures involves nonlocal circulation. This was the one area where the local catalog would be unlikely to affect choice of books, and it was the only area where the enhance group did not have the most additional circulations. The enhance group had four nonlocal circulations (including one renewal), the control group had one, and the contents group had five. After adding these nonlocal figures, the enhance group accounted for fifty total circulations (51%), while the control group accounted for twenty-three (23.5%) and the contents group for twenty-five (25.5%).

The circulation statistics and the chi-square test results are inconclusive regarding whether or not the addition of controlled subject headings leads to higher circulation. The data all point toward the likelihood that the added subjects for the enhance group did influence

The data all point towards the likelihood that the added subjects for the enhance group did influence circulation.

TABLE 1
SUMMARY OF USE OF EXPERIMENTAL GROUPS DURING 1988/89 ACADEMIC YEAR

Group	Enhance	Control	Contents	Total
1. Titles circulating once or more (local circulations only)				
n	97	97	96*	290
n circs	23	14	13	50
% of group circs	46%	28%	26%	100%
Chi-square: 4.30 (with 2 df, .05 level significance requires 5.99)				
2. Separate local circulations per title, excluding renewals				
n circs	26	15	13	54
% of group circs	48.1%	27.8%	24.1%	100%
3. Total local circulations, including renewals				
n circs	46	22	20	88
% of group circs	52.3%	25%	22.7%	100%
4. Nonlocal circulations, including renewals				
n circs	4	1	5	10
% of group circs	40%	10%	50%	100%
5. Total circulations, including nonlocal and renewals				
circs	50	23	25	98
% of group circs	51%	23.5%	25.5%	100%

*One book missing

circulation, but, as seen above, the chi-square test on first-time local use per title did not show a statistically significant difference among the groups. The number of recorded uses was too small for an analysis of variance test of the data to be appropriate, but sufficient evidence was found to warrant future investigation on a larger scale.

Before drawing conclusions and making recommendations for further research, it remains to comment on some other possible influences on book use. Other factors which could have had an influence in this library setting—browsing, keyword searching, and the OPAC display—can be measured to a degree.

BROWSING AND CIRCULATION

The three test groups were drawn from a homogeneous population. All were added to the collection during the same period, were similar in publication date, length, and number of LC subjects (before the enhancements), and were evenly distributed throughout the H classification. The fact that none had previously circulated eliminated a number of influences as likely causes of their use during this period, which left browsing as a prime consideration. How likely was it that users found the books by scanning the shelves rather than by searching the online catalog?

In some libraries, users may be so familiar with the collection that they can bypass the catalog and go directly to the shelves, where the display of titles can influence selection. Taylor found that at a medium-sized public library there is a significant relationship between eye-level shelf position and book use,[22] and S. L. Baker also reported that prime display location increases public library circulation.[23] Herman Fussler and Julian L. Simon noted that even in a research collection, some book use may possibly be related to shelf position.[24]

In the test library, the social science collection was shelved in open stacks. There were an estimated 85- 90,000 titles plus many added volumes in the H classification. These occupied about twenty-six double-faced stack ranges which were as long as forty feet, stood seven shelves high, and were separated by

thirty-inch aisles. The bottom shelf was just three inches off the floor, with the other shelves positioned at about one-foot intervals. The top shelves were not at a uniform height but varied from about eighty to eighty-four inches off the floor.

The highest and lowest shelves were the least accessible to browsers. Shelves four through six (counting upwards) were at or near eye level for most users, and these books could be easily reached. Reaching shelves two and three required a deep knee bend, though a kneeling person could browse and reach easily.

Table 2 shows the number of books per shelf, the number of local circulations, and the percentage of items circulated. Highest circulation percentages are for levels two (not readily browsed) and six (easily browsed), followed by level three (not readily browsed), levels seven and four, etc. There is no clear pattern. The circulation rate is twice as high for level seven, which often requires use of a step-stool, than for the very accessible level five (which has lowest local use—7.5%). Thus, it appears that shelf location was not a decisive factor in these circulation statistics.

A less obvious type of browsing involves the physical appearance of the book. Table 3 shows the local circulation breakdown by type of binding. About two-thirds of the books are in the original publisher's hardcover bindings, and these are nearly twice as likely to circulate as rebindings (i.e., former paperbacks). However, the enhance group has the fewest original bindings (fifty-eight, compared to sixty-five for the control and sixty-three for the contents group), and the circulation rate of rebound enhance books is actually slightly higher (17.9%) than the rate for original bindings of the other groups (16.9% and 17.5%). Thus, it is clear that the higher

TABLE 2
SHELF LEVEL AND LOCAL CIRCULATION

Shelf	No. of Books	Local Circ. (no. and %)	Rank (by Circ. %)
7 (top)	32	5 (15.63)	4
6	49	12 (24.49)	2
5	40	3 (7.50)	7
4	45	7 (15.56)	5
3	39	7 (17.95)	3
2	53	13 (24.53)	1
1	32	3 (9.38)	6

TABLE 3
TYPE OF BINDING AND LOCAL CIRCULATION

Enhance	Original Binding	Rebound
N	58	39
Local Circ. (n)	16	7
Local Circ. (%)	27.6	17.9
Control		
N	65	32
Local Circ. (n)	11	3
Local Circ. (%)	16.9	9.4
Contents		
N	63	33
Local Circ. (n)	11	2
Local Circ. (%)	17.5	6.1
Total		
N	186	104
Local Circ. (n)	38	12
Local Circ. (%)	20.4	11.5

use for books with added subjects was not the incidental effect of their having a preferred binding. And it appears that browsing—as defined by shelf position and physical appearance of books—was not a deciding factor in circulation at this research library.

OBSERVATIONS ON KEYWORD SEARCHING

Keyword searching is a major advantage of an online catalog. It frees a user from the restrictions of controlled subject vocabulary and permits serendipity to play a role in access. This has led to considerable speculation on the possibility of improving subject access by making catalog records more amenable to keyword searching. Markey and Calhoun have shown that contents notes are a major source of unique terms in MARC records and are one of the most practical ways to add subject-rich terminology to catalog records.[25]

The presence of an easy-to-use keyword capability combined with added subject terminology from contents notes may improve retrieval potential.

Because keyword searches may serve as substitutes for unsuccessful controlled subject searches, adding a contents note as well as additional LC subject headings can lead to confusion over which factor predominates in bibliographic retrieval. For this reason, a third category was added to the experiment—a group of records with no added subjects but with a full contents note. If both the enhance and contents note groups had equally high circulation compared to the control group, it might be assumed that either keyword searching or the additional information present for the user in the online display was a key factor influencing choice of books. If the contents group had fewer circulations than the enhance group, but more than the control group, it also might be assumed that the notes themselves were having a positive effect, but that the additional subjects were a further positive factor.

As seen from table 1, the contents note group in fact had the lowest local circulation by all three measures. This was a small difference from the control group, but, because these records presented more information to the user, the result was unexpected and indicated a need for further investigation of keyword searching on the public catalog.

The NOTIS-based local online catalog is an easy system for users to learn. Commands are few and straightforward, and automatic right truncation of search terms means that the user need not enter a full heading to receive a response. Keyword is more challenging, but it was routinely introduced during quarterly catalog demonstrations and also featured on the introductory help screens. Keyword was available on the local online catalog for the first forty-five weeks of the experiment, then temporarily suspended because of installation of NOTIS 4.6. During these forty-five weeks the public catalog averaged 79,100 transactions per week; of these, an average of just 2.04% were keyword. Although figures were not available for other types of searches, the highest weekly figure for keyword searches was 2,799 out of a total of 118,230 public catalog transactions.

Because keyword had also been available prior to the experiment, the author returned to the full data for 1986 additions in the social sciences. Seven hundred ninety-three titles identified as collections of essays and conference papers had been added that year. As of the summer of 1988, 502 had circulated at least once and 291 had not. But only a small minority (7.2%) had contents notes. The number of contents notes on collections having circulated was only twenty-three (4.6%), while for the uncirculated group it was thirty-four (11.7%). A chi-square test gave a value of 13.93, which showed this difference to be significant at the .001 level.

These figures are puzzling. Because most of the cataloging was done by LC,

and LC apparently added contents notes sparingly at this time, it might be that books with these notes represent qualitatively different material. The alternative—that users are more likely to reject a book than to select it based on a reading of the contents note—does not explain why they would not do the same thing for the enhance group. At any rate, it appears that the presence of an easy-to-use keyword capability combined with the added subject terminology from contents notes may improve retrieval potential, but does not, by itself, assure that books will have a higher use rate.

OPAC DISPLAY

According to the three measures of local circulation, the major factor contributing to increased use appeared to be the additional subject headings which made these works more accessible to users. This must be viewed within the context of the OPAC display.

NOTIS 4.5 subject searches display data in newest-first order. In most cases, the user first sees a guide screen with all matching subject terms. The user requests a particular subject or subject-subdivision combination and next retrieves an index screen with one-line title entries in reverse chronological order. From this point one may choose to see the full record for a title. Relatively new works appear on the first index screen unless there are a very large number of new titles. A title with a subject subdivided to a more specific level becomes even more likely to display prominently.

Because the books in this experiment were mostly new, with a mean publication date of 1985, most of their subjects would have appeared near the top of index screens during the 1988/89 academic year. Some of these subjects were also unique and would be the lone response to a request for a line on the guide screens. (Dwyer has observed that "very specific subject headings are particularly useful in online catalogs with large databases."[26]) Thus it seems that both the additional subjects, plus their favorable online display position, combined to make it more likely that users would choose the enhanced titles. One cannot assume that a similar addition of subjects to a card catalog, or to an OPAC which displayed them in alphabetical rather than reverse chronological order, would have the same effect. However, if this explanation accounts for the observed higher local use, it also may indicate a general method of increasing book use in large research collections. Providing more subject information, and making its display prominent to the catalog user, appears to be a successful combination for promoting the use of newer books.

DISCUSSION AND CONCLUSIONS

The problems of subject access and book use in a research library become increasingly complex when an effort is made to link the two, yet without making this link a library may not receive the full promise of catalog improvements. An assumption of subject enhancement theory is that patrons will benefit by finding and using more books, or different books, than they would have found previously. This experiment tested one method of increased subject access and found some indications of such benefit.

The project was designed to test whether adding a substantial number of controlled subject headings would have a positive impact on book use—an effect that was not observed in previous studies that tried to correlate circulation with the number of subjects or access points on existing catalog records. Despite the fact that the variation in circulation of the titles fell short of the .05 level of significance in a chi-square test, the findings offer encouragement for future testing in this area. By three different measures of local circulation, the subject-enhanced records accounted for about half of all use even though they represented only a third of the books. These figures indicate that use might be increased to a statistically significant level through further subject additions.

These findings raise the question of whether circulation rates for research library materials may be improved through catalog enhancements. While it

is clear that many books are simply too specialized to be used often, it appears that a substantial increase in the level of subject indexing may have a positive effect on use in specific areas—in this case, essay and conference paper compilations. Further testing in other library settings is needed to see whether similar or better results can be obtained and to determine whether such use is high enough to justify added cataloging costs.

One generalization is that precoordinate subject indexing still has an important role to play in the era of online catalogs. Although the evidence gathered here was mixed and should be viewed with caution, the enhance group had consistently higher local circulation than the other groups. While previous studies have found no correlation between number of subjects and frequency of circulation, this is probably because there is little relative difference in subject depth between books in standard cataloging. Adding a substantial number of subjects in order to bring out more of the content is a different approach to cataloging.

If the added subjects truly led to more use, the online subject display must have been a contributing factor. This newest-first display is an effective way of bringing such titles to the attention of users and should be given close consideration in catalog design. In a large research library users may prefer to browse the online catalog rather than browsing the shelves, but only if it is easy to find the type of materials they are seeking. In a subject search, these materials are often the newest works on a topic.

Adding contents notes to catalog records is a convenient method of increasing the number of terms available for keyword searching, but such records were not associated with higher circulation rates in this experiment, possibly because patrons used keyword searching relatively infrequently. The fact that a search capability is easy to use apparently does not guarantee that it will be used often, or efficiently, by patrons accustomed to the usual author, title, and subject searches. An interesting extension of this research would be for a library to place a major emphasis on promoting keyword searching, then observe whether little-used books began to circulate more frequently.

Browsing, defined as ease of viewing and reaching books on different shelf levels, did not have any consistent effect on book selection. Type of binding had a positive overall association with book circulation, with users preferring original bindings. However, when analyzed further, type of binding proved not to be the cause of higher enhance group use.

Although encouraging, these results are not an unqualified endorsement of controlled subject vocabulary as the best or only means of enhancing catalog records. The process is very time consuming, and adequate terminology is not always available in LCSH for describing an essay-level subject. More important than the particular method used, however, was the indication that an increase in subject-access terms available for searching may indeed be a key to higher book use.

In addition to increasing the number of LC subjects on new cataloging, the search process itself could be modified. Concepts such as the "Superthesaurus" described by Marcia J. Bates,[27] designed to channel a wide variety of search terms to the controlled vocabulary actually in use, would increase the likelihood of a user arriving at one of the assigned subject terms. The effects of a "Superthesaurus" for the user might be similar to the labor-intensive addition of more LC subjects, particularly for those general works which are more difficult to enhance than are collections of essays. The online catalog display is also clearly important. New subjects are less likely to affect use if they are not linked to titles which appear prominently in an online index. It would be helpful to test various approaches in actual library settings to see how they perform compared to the traditional catalog.

In conclusion, the experiment produced mixed results. The data suggested that greater subject access may actually have an effect on circulation patterns in research collections, though the statistical test employed did not rule out chance error as a possibility. However,

the project did provide a methodology for testing the practical effects of subject enhancement, and the results were more encouraging than earlier research in that there was a definite pattern of more use for enhanced materials.

Further study along these lines is certainly called for as a result of this experiment. The problem of providing better subject access for research collections remains one of the greatest challenges and opportunities for catalogers in the 1990s.

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The Lean Reference Collection: Improving Functionality through Selection and Weeding

Christopher W. Nolan

Librarians expend significant amounts of money, time, and space on their reference collections, yet a surprising number state that their collections are full of materials which receive little use. Additionally, a large proportion of academic libraries do not have collection development policies for this important asset. The author discusses this problem and develops a series of guidelines for placing sources in reference, focusing especially on the suitability of the items for true reference functions and the expected frequency of use.

Librarians implicitly assign the reference collection a high value, yet the professional literature contains little discussion of its management.[1] Expenditures are the most obvious proof of this value. Librarians spend a significant percentage of library materials budgets on reference books, serials, and, increasingly, automated products. Just in terms of size, the number of titles in academic library reference collections range from a median of 5,000 titles in small college libraries to almost 30,000 titles in ARL libraries—and many of these libraries indicate that only space limitations keep these numbers from growing.[2] Space devoted to a reference collection provides another tangible measure of its value. Most academic libraries assign the reference department and collection to a highly visible location, one that students and faculty will find accessible—what Mary and Victor Biggs call "highest-priority library space."[3]

Perhaps less tangible, but more important, is the usefulness of this collection for the provision of reference service. The reference collection is, along with the catalog, frequently the first (and sometimes only) source consulted while helping users. If the quality of reference service hinges on the resources marshaled for support, this close-at-hand collection should be critical.

Many patrons also place significant value on the reference collection. Anecdotal evidence suggests that patrons often perceive reference items to be more authoritative than those items not in reference. This logic is not difficult to follow. Reference books do not circulate, and often must even be requested at a reference desk. Librarians, asked for help answering a query, turn to some sources in reference and deliver the desired answer. Bibliographic instruction librarians demonstrate the use of indexes and provide lists of other suitable reference items. Current statistical sources are kept in reference, with earlier, outdated editions going to the stacks. All of these factors suggest to the library user that those people with expertise, the librarians, significantly value reference books.

THE PROBLEM: POORLY MANAGED COLLECTIONS

This value should have resulted in

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most libraries devising comprehensive policies for managing this resource. However, the Biggs' survey in 1985 found that only 7% of undergraduate institution libraries, 17% of masters-level libraries, and 59% of ARL libraries had written reference collection development policies. Even fewer libraries had policies for managing ready reference collections.[4] Eugene A. Engeldinger found that less than 12% of academic libraries had a written policy concerning weeding of the reference collection.[5]

Many reference librarians think their reference collections are too large to be used effectively, and that it is difficult to keep track of what is in the collection and what should be updated or weeded.

Does the absence of these policies mean that reference collections are not being managed effectively? It could be argued that other subject collection policies and procedures cover reference materials adequately. However, the Biggs' survey strongly suggested that a large number of reference collections are just too large to be used efficiently by librarians. Librarians at all types of academic libraries estimated that over 25% of the items in their reference collections had not been used in the last five years, and that half the collection was not used in the last year.[6] Although these were rough estimates, they indicate that many reference librarians think their reference collections are too large to be used effectively, and that it is difficult to keep track of what is in the collection and what should be updated or weeded.

In addition to collection size, the quality of information contained therein should also be considered. If patrons and librarians frequently regard reference materials as more authoritative or valuable for answering their questions, and the collection contains seriously outdated materials, librarians may be relying on inaccurate sources.[7] Gail Schlachter's short survey of reference collections and policies reported that, although most of the libraries had outdated editions of particular materials, those with reference collection development policies were more likely to provide recent (and more accurate) editions than those libraries without policies.[8]

REASONS FOR THE PROBLEM

Thus, many libraries, through failure to manage carefully, have created large, unwieldy reference collections which contain outdated or unused sources. Four primary factors contribute to this deficiency. First, new reference tools have proliferated over the past few years. Librarians may have been more concerned with acquiring these new sources than with determining how their coverage compares with already-owned sources or with weeding titles that are no longer necessary.

Second, we have not operated with a clear definition of a reference source. Responses to Marcia Bates' question "What is a reference book?" were that the definition was obvious, but also difficult to pin down—often from the same respondent.[9] Merely using the basic *ALA Glossary* definition—that a reference book is a book used mainly for looking up definite pieces of information, rather than for continuous reading—is not sufficiently helpful because this definition is relative.[10] What one reader may use only for referral—say, a commentary on the New Testament used to find information on a particular passage—another reader may read cover to cover. Likewise, librarians evaluating a new title for inclusion in the reference collection may debate whether a collection of essays with lengthy bibliographies will be used more for referral, or consecutive reading. This quandary apparently led Bill Katz to remove a very relative definition of a reference book from later editions of his standard reference textbook.[11]

Third, it is unclear what sorts of reference books need to be in the reference

collection. Frequently, one librarian's "essential for reference" source is considered obscure or trivial by colleagues. Of course, this difference of opinion can occur even when a well-defined collection development policy is in force and when interpretation varies. But it is much more likely when oral tradition, rather than written policy, guides the decision.

Fourth, the nature of the reference collection hinders its effective management. Reference sources can be classified both as reference items and as items within subject disciplines. In many libraries it is unclear whether a particular reference source will be ordered by the subject bibliographer or by a reference bibliographer. It is also unclear whose responsibility it is to determine the location of the item (reference or stacks) and who weeds and evaluates the reference collection. In such situations, strong coordination of reference collection functions is necessary. Yet the compilations of collection policies in the literature show that many libraries have not clarified this role, allowing the reference collection to be neglected.[12]

STEPS TO A SOLUTION

Given the need for more attention to reference collections, how do we manage these issues more effectively? We will hardly be able (or want) to stem the flow of new reference sources in both traditional and electronic formats. More careful selection can avoid purchase of sources which duplicate existing items, and better book reviewing can aid careful selection.[13] Creating a reference collection development policy would be a positive step toward better management. However, most of the policies in the aforementioned collections give little rationale for the entire enterprise. Instead, policies immediately launch into discussions of types of reference sources.[14]

Libraries need to consider systematically what they want in their reference collections, why they want them there, and how they are placed there. This process requires five steps: first, defining more carefully what is meant by "reference source," because this is the building block of our collection; second, delineating the purposes of the reference collection; third, deciding just what types of reference sources belong in reference to achieve the best level of reference functionality; fourth, determining what makes some reference sources inappropriate for the reference collection; and fifth, clarifying administrative responsibility for the collection. Each of these steps is elaborated on below.

1. What is a Reference Source?

The most common definition of a reference source that appears in the published collection policies follows that already cited from the *ALA Glossary*: a book designed to be consulted for definite items of information or a book whose use is restricted to the library building.[15] The latter is, as Bates says, an administrative definition; an item is "reference" because we put it in the reference collection.[16] Such administrative definitions are not particularly helpful in determining collection criteria. More helpful is the first definition. A book is a reference book because it has particular features—not defined in the *Glossary*—that encourage a certain form of use, i.e., consultation instead of consecutive reading.

Some have argued that a reference book is not defined by intrinsic features, but that any item a patron uses for consultation in order to find discrete bits of information can be considered a reference book.[17] Certainly librarians know that users will employ almost any source in the library to find the facts they wish to locate. But a definition this relative says little about why we put particular books in reference and others in the stacks. Following this logic, we might as well categorize reference books as tools that hammer in nails or prop open doors, for some users will do these things with books. Instead, we recognize intuitively that some sources work much better for reference tasks than others. That is, a reference book is *not* normally read consecutively, but is con-

sulted, and a stacks book is more likely to be read in a continuous manner. Something about reference sources distinguishes them from nonreference items.

Bates argues that the key feature of a reference book is that it consists largely of files—that is, it contains records, or information "individuals"—which are ordered according to some principle.[18] These records can be further broken down into fields, or units, of data. For example, both an almanac and a bibliography arrange records into particular orders offering various access points. The arrangement of data into a file structure enhances the reader's ability to find a certain piece of information more quickly than would browsing through texts of continuous exposition.

This definition fits with the intuitive rationalizations often heard for putting an item in reference. For example, most librarians would classify an annotated bibliography of 200 pages with an introductory essay of about thirty pages as a reference book. But most would send a 200-page essay followed by a thirty-page annotated bibliography to the stacks. Why? Wouldn't both work well for finding a number of key references on a topic? Yes, but the former seems most suited for reference and the latter for circulation, precisely because the first is primarily bibliography and the latter is primarily text. That is, the first consists predominantly of *files* and the latter of continuous exposition. Librarians expect users to do lengthy, continuous reading only from the latter.

There are exceptions for placing books in reference, though Bates' empirical study demonstrates that these are few. Some are placed in reference for administrative reasons, most notably theft-prevention. But her data demonstrated that most of the exceptions could be categorized as "authoritative texts": U.S. or state law reporters, the Bible, classic histories and treatises.[19] Placing these volumes in reference appears to reflect the view that these titles are so important that users would be greatly inconvenienced by their absence from the library. Also, in most cases, it is not expected that users will want to read them cover to cover. Instead, users will look up a particular Bible passage or U.S. court decision, or use the index in a monumental history to locate a key date or bit of biographical data. Thus, the reference librarian sees these sources as being used for consultation more than reading and can justify their location in reference.

Bates' study is excellent in deriving a definition of the intrinsic nature of these reference books. However, two points need further discussion. First, she states that 90% or more of all reference books could be accurately assigned to reference collections—even by a clerk—assuming that the person making the decision understands how to judge a book's file structure. This statement assumes that all reference-format books belong in reference collections. But this obviously conflicts with the practices (and the few policies) of most libraries.[20] Certain reference books routinely are placed in the circulating collection: superseded and outdated editions, highly specialized bibliographies, texts in languages rarely encountered by the library's clientele, etc.

Second, Bates focuses on reference *books*. Her discussions do not explicitly include other media of information used by reference librarians and patrons. Yet a growing number of libraries use multiple sources, most notably machine-readable files, for solving reference queries. Online databases and CD-ROM indexes, even online catalogs, serve as reference sources on a daily basis at many desks. Like reference books, databases are built with a logical file structure, composed of ordered records arranged in such a way as to facilitate consultation for rapid retrieval of bits of information rather than continuous reading. These online sources thus fit the definition of a reference source and should be evaluated alongside other reference sources.

However, different methods of budgeting for automated sources and, frequently, different ways of staffing for

their use sometimes exclude consideration of these sources from the normal reference collection management process. Sheila Intner calls attention to two of the many problems which can occur when these different types of reference sources are not considered together. First, the important issue of whether an automated database can serve the users' needs more effectively or cheaply than printed sources is ignored or avoided.

The question now is which of these reference-format sources belong in the reference collection and which should be sent to the stacks or not be purchased.

Second, the automated sources often become physically separated from the remainder of the reference collection. This separation frequently occurs because of wiring problems or the convenience of sufficient space for the terminals. Thus, users attracted to the more flashy automated sources may come into less contact with reference books—and reference librarians.[21] This arrangement risks either misleading users into believing that all of the important tools are computerized, or at least keeping them from learning about the variety of other sources that libraries can bring to bear on their needs.

Given that some agreement on what constitutes a reference source exists, the question now is which of these reference-format sources belong in the reference collection and which should be sent to the stacks or not be purchased. The crucial factor is how a potential source will be used. Does that use warrant adding it to the reference collection?

2. *Uses of the Reference Collection*

Patrons may use the reference collection independently, or they may be referred to particular sources by a reference librarian. In either case, patrons use the collection in place of the remainder of the library's collection because they think beginning in reference seems to be more convenient or efficient than wading through the stacks. This follows logically enough from the nature of the sources housed in reference—items designed for quick consultations.

Many authors of reference textbooks classify reference sources into two basic categories according to the type of answer they provide the user: those that give the information outright, and those that tell where the desired information may be found.[22] The former are often called "fact books," for they are most often compilations of facts in defined areas of interest. Of course, they may be in formats other than print, such as a CD-ROM encyclopedia. Fact books, using the reference file format, permit the user to find these discrete bits of data more efficiently than would be possible in other sources in the circulating collection.

The second type of reference source is what we might call a "pointer," for it directs the user to another source which contains the information sought. These sources are often called "bibliographic" tools, for they most frequently contain bibliographic references to items on a given topic, by a particular author, or housed in a certain collection. Periodical indexes (paper or electronic), author bibliographies, and the library's catalog are examples of this kind of source. Normally, users of bibliographic sources have at least one extra step in their search for information than do fact book users; they must look up the citation, then locate the referenced item itself.

In spite of the difference in search procedures, users of both kinds of reference sources are following similar methods. They are using reference sources as *surrogates* for other information sources. Fact sources summarize and abstract data originally published in other materials. Bibliographic tools also contain surrogates; for example, a citation which appears under a subject heading in a periodical index is standing for the original

source, alerting the reader to the original's attributes.

Surrogates are not in all cases necessary, for a user could find the desired information by browsing the stacks and never using reference sources. Many users do, in fact, search in such a way. But growing collections become increasingly difficult to use when searching for a particular bit of information. Most people probably do not need a catalog for their home libraries; they can find what they want much more informally. But a collection of hundreds of thousands of volumes cannot be effectively approached the same way. Thus, as collections in libraries grew geometrically during the last century, a profusion of reference sources have also been created to serve as guides to these large collections.

The library catalog is one tool which has served almost solely as a guide to the local collection.[23] However, other reference sources have always included references to materials not owned by the local library. A reference collection alerts the user to the wider information universe, not just what can be found on location. UCLA's collection development policy succinctly defines this role by indicating that the reference collection is the "key" to holdings of the local branch, the university's other libraries, and other libraries in this and other countries.[24] The level at which the local reference collection supports access to this wider world of information will vary, however, with the basic philosophy of reference service and with the budget. Unlike at UCLA, for example, a small college library staff may determine that undergraduates will do just fine by using only the items owned by that library. Thus, they may acquire many fewer reference sources, avoiding those which list materials held outside their building.

But whatever the collection philosophy of the library, the reference collection must still meet its role of being an efficient guide to the larger information universe of which it is a surrogate. Convenience and ease of use by users—patrons and librarians alike—are frequently cited as objectives of the reference collection.[25] If the collection becomes too complex and unwieldy, users will take longer to find what they need. In the worst cases, they will not use the collection, will stick with only a few known sources, or will be defeated in their search for information. In fact, several studies indicate that users operate on the principle of "least effort"; that is, they will do as little work as necessary to find information and will often prefer information with less pertinence or authority if it is more easily available than "better" information.[26] Consequently, librarians must balance comprehensiveness of coverage with ease of use and avoidance of excessive complexity.

3. *Characteristics of Sources Belonging in Reference*

Books and other media sources chosen for the reference collection should be evaluated in the same manner as other acquisitions, taking into account such factors as general quality, reputation of author or publisher, and suitability for users. But the previous discussion has indicated that reference sources have a particular character and are put in reference to facilitate the rapid finding of facts or references. Based on this finding, the following characteristics should be met by titles to be added to this collection.

Librarians estimate that more than half their reference collections are not used in any one-year period and almost one-third are not used in five years.

A. Reference format. As discussed above, sources predominantly structured into files allow easier and quicker consultation. Those with mainly continuous text usually do not belong in the reference collection unless a case can be made for their convenience of use.

B. Frequently used. Librarians esti-

mate that more than half their reference collections are not used in any one-year period and almost one-third are not used in five years. What, then, are these materials doing in reference? Surely items used less than once per year do not need to occupy space in a collection selected precisely to provide quick and convenient access. The reference stacks themselves are a file, an organized set of volumes which lead to facts or citations. Cluttering this file with rarely or never used sources merely dilutes the effectiveness of the remaining useful sources.[27] Richard Dougherty writes that ARL libraries need to start weeding the dead wood out of their circulating stacks so that users may more easily find the materials they are likely to use.[28] This is much more important for a reference collection. Even someone who has provided lists of many different reference titles, Constance Winchell, reminds us that the "most important element in the equipment of such a department is an adequate and *live* collection of reference books."[29]

Many of the author's colleagues find frequency of use to be a debatable criterion. They argue that a reference collection would not be complete without certain sources, even those that fail to receive even occasional use. Yet most librarians often follow this frequent-use guideline. For instance, a good dictionary of Texas slang would probably be put into reference at a library in Texas, regardless of the size of the collection. But a small Midwestern college library would probably be less likely to do so, or perhaps would not even purchase such a volume. The determining factor is the difference in amount of expected use; the Midwestern school is probably less likely to see this item used. Implicitly, librarians do, in fact, use this criterion on occasion. What is needed is a more consistent and explicit application of it, both when a source is selected and when it is reviewed for weeding.[30]

Another argument contends that providing reference sources on subjects not well-represented in the general collection is cheaper and easier than trying to enlarge the circulating collection in those areas.[31] Certainly the availability of items through interlibrary loan gives merit to purchasing such secondary sources. But this does not support placing them in the reference collection. On the contrary, if the subject is so peripheral that only a rare patron uses the secondary source and the collection is weak in that subject, then it would be more beneficial for that patron to have lengthier access to the source, which circulation would aid rather than hinder.

This guideline assumes that librarians can accurately judge or measure how much use the materials in reference receive. Certainly, it would be preferable to gather firm data on the use made of each item in the collection, as is sometimes possible for circulating items. A barcoded reference collection could presumably allow each item to be scanned before reshelving, thus creating the data for this analysis. More probable is that libraries which have done little previous analysis will need to do a detailed, manual use study or to have the reference librarians examine the collection and confer about perceived use patterns.

Many writers have discussed the problems associated with attempting to gauge the use of library materials.[32] For example, scanning items before reshelving may underrepresent true use because many users will place the books back on the shelves themselves. However, unlike the circulating collection, the appropriateness of materials in the reference collection is frequently monitored by reference librarians who use the collection and refer patrons to it. If useful sources are removed from the reference collection, staff will receive prompt feedback about the mistakes, whether from their own searching or from patron comments. Consequently, even though some disagreement can be expected among the reference staff about perceived use, a surprising degree of consensus about those sources which have proved useless will be possible.

C. Authoritative. As mentioned above, patrons often see items in the reference collection as more authoritative than

other sources. Further, this collection is often the sole source for librarians attempting to help their users. Thus, sources located in reference must be worthy of this reliance. In fact, this seems so obvious that some librarians wonder why it should even be necessary to mention it.[33] Yet this criterion is often ignored. For example, *The Gourman Report,* a source which has received negative reviews for its unreliability, is routinely added to reference collections and referred to by librarians.[34] No doubt many would respond that no other source fills its niche. Besides, its name recognition lends it a sort of cultural authority. But, if the critiques are valid, wouldn't a more prudent course be to leave the niche unfilled and explain to users the lack of dependable ratings services for colleges? If users will frequently choose an inferior, but more available, source of information over a more dependable source which is harder to access, selectors must be more active in their reviewing of potential reference sources and more choosy about selecting titles.

D. Current. Again, currency seems to be an obvious characteristic, one which countless policies and articles mention. However, Schlachter noted the frequency with which outdated editions reside in reference collections, and Engeldinger reported on the rarity of weeding in most collections. Of course, date of publication alone does not determine a volume's currency; its information may be as current as is needed. But the many handbooks and directories present in any collection mislead users when their data are several years old. Users may assume that the most current information is in those outdated sources, when dozens of other sources in books, articles, or online databases may be more recent and accurate.

Further, past volumes of periodical indexes or serial bibliographies are usually kept in reference. However, many of these volumes do little more than gather dust. Few users (especially students) will search more than the most recent few years of an index. Past years of indexes which provide coverage of contemporary reactions or styles, such as the *Readers' Guide* and *New York Times Index,* still remain quite valuable. But twenty-year-old volumes of *Biological Abstracts,* for example, could be moved to the stacks and perhaps be designated "noncirculating."[35]

E. Provides unique coverage. Sources should offer a distinctive contribution to locating information within their subject scope. If a source is superficial or duplicates other sources already in reference, there is little reason to add it to reference. We may all be guilty of purchasing the newest subject dictionary or statistical handbook for reference even if it duplicates others already in the collection. Of course, sometimes a particular subject area receives so much use that it becomes necessary to provide either more copies of the source or alternative sources. But the collection need not be cluttered (nor the budget encumbered) by purchasing sources which add nothing new to what is already there. An exception here would be sources which, by their nature, contain a fair amount of bias or a particular slant. For instance, Bible dictionaries written from evangelical Protestant, Catholic, and liberal Protestant perspectives may vary considerably in their definitions for certain concepts. In this case, proper coverage in the reference collection may require representative dictionaries from several major perspectives.

4. Types of Sources that do not Belong in Reference

Obviously not meeting the characteristics listed above would provide reasons for placing a source into the circulating collection instead of reference, i.e., not in reference format, or rarely used, unreliable, or redundant. However, librarians, citing "oral tradition," frequently mention a few other justifications for placing sources in reference. Some of these arguments are critiqued below.

A. Requires instruction by librarian. This criterion seems to imply that because a reference source is difficult to use, it

should be near staff members who can explain its use to patrons. But if the source is very difficult to use and is thus rarely consulted, it need not take up space in the reference collection; it does not serve well the purpose of more efficiently aiding users' research. However, if the source is essential and frequently consulted, it should be added to reference anyway. It can also be argued that the stacks are full of sources which are difficult to use, but patrons are on their own with them. If this criterion means that sources frequently mentioned in instructional sessions (and thus likely to be used) should be located in reference, then their usefulness and authority, not their difficulty of use, justify placing them in reference.

B. Protection from theft or mutilation. Occasionally a source is put in reference because it either has been stolen or mutilated in the past or that likelihood is suspected. Placement in reference presumably offers added protection. However, a reference collection created to enable efficient research and quick fact-finding does not function as well when it must dilute its file structure to become a safe haven for expensive materials. In almost all academic libraries, materials which need greater supervision than normal can be placed on reserve circulation. Theft-prone items are better placed on reserve (or in special collections rooms) than in reference.

Many libraries locate heavily-used (and thereby theft-prone) reference items in a "ready reference" collection. This approach is valid when the items already fit the reference criteria discussed earlier, but it is a waste of space and librarians' time (for retrieval, holding ID cards, etc.) when the sources are only there to prevent theft.

C. Consistency of location. All things being equal, most of us would prefer to put like sources in like locations. When we begin to purchase a monographic series of bibliographies, for instance, we often automatically add each new volume to the reference collection. However, this policy can easily lead to a bloated collection. Many of these volumes may concern subjects rarely pursued by the library's clientele or may be less valuable than others in the same series. Each additional item in a series should be considered individually according to the accepted set of criteria. An exception to this would be a series in which one volume refers to other volumes in the same set, such as the *Dictionary of Literary Biography.*

D. Fills a niche. Reference librarians usually applaud a new publication which covers an area previously neglected. Impressed as we are by well-made reference tools, we tend to put these items into the reference collection because "we don't have anything else on that subject." However, most subjects will be covered in a general reference collection by at least the broader sources, such as encyclopedias and guides to the literature. The new source should be evaluated by the other criteria, especially expected frequency of use. A source filling a small niche, however nicely done and unique, should be sent to the circulating stacks if very little demand is expected.

E. "Classic" source. Finally, there are those sources which one or more librarians (or sometimes patrons) believe *must* be in any quality reference collection. Some of these tools have earned this status by years of productive service to librarians, and they may indeed be essential acquisitions. Others exhibit superior writing or editorial design. But each library's collection serves a different set of user needs, and a source much used at one institution may have little use at another. If it is rarely needed, it probably should be located in the stacks collection. These titles should be purchased for the general collection if they fit into the library's collection policies. If they become more valuable as a curriculum changes or subject interests shift, they can at that time be moved to reference.

5. *Administrative Responsibility for the Reference Collection*

A perusal of reference collection development policies shows that various systems of selecting and supervising the

collection are practiced. Rebecca Kroll lists a few of the people that usually select the reference sources for the collection, ranging from the subject bibliographer, who does not work in reference, to the reference subject specialist. She also lists the people who most frequently function as the managers of this process, including heads of reference, coordinators for reference collection development, and committees of reference librarians.[36]

However, both the noted lack of collection development policies for reference and the comments of many colleagues indicate that oversight for the reference collection is often lacking or poorly defined. A major reason for this confusion is that reference sources may be classified both as subject materials and as reference-format sources. Because most academic libraries divide responsibility for materials selection by discipline, overlaying further responsibilities by type of material can be difficult. Many problems result from a lack of careful management.

First, the assignment of selection for a discipline to just one individual bibliographer allows the idiosyncrasies of that selector to color the makeup of the collection. Imbalanced selection, especially excessive additions to areas not calling for such build-up, is possible without oversight. Second, sources which do not fit neatly into a division of responsibility by subject disciplines may be missed by selectors who assume another librarian will order them. For example, interdisciplinary items and general items (such as almanacs and biographical sources) often defy easy categorization by subject. Third, selection may occur in the absence of feedback concerning the use made of the collection by patrons and staff. This situation is especially likely when librarians who may spend little or no time with the library's clientele, such as subject bibliographers or heads of reference, are responsible for adding to and weeding out the reference materials.

The first two problems both stem from the lack of someone overseeing the entire reference selection and deselection process. The most obvious solution would be the appointment of an individual or committee to ensure that the selectors properly address the entire scope of the reference collection and that the collection is balanced within the framework of a reference collection development policy's goals. This person or committee must have the authority to allocate funds directly from a reference account and also to question perceived errors of selection or weeding by the various reference selectors. This position need not have the power to prevent the other selectors from ordering items they would like to add to reference, but it should have the ability to refer the discussion of adding these materials to an assigned point of resolution (e.g., the head of reference).

Whether a committee or a designated librarian has the authority for these decisions is not as important as is the explicit designation of someone to take charge of the process. Libraries cannot continue to allow a variety of individuals to make haphazard decisions about what the reference collection should be.

The third problem exists when the persons making decisions about reference materials have little knowledge of the uses made of the collection. In academic libraries with several staff members serving at the reference desk, it is impossible for any single librarian to have a complete picture of the use made of the collection. Thus, it is important to set up a formal mechanism for discussing appropriate titles to add or weed. The best scenario would include regular reference staff meetings to consider individual reference sources for addition or deselection and to voice staff experiences in working with patrons who use those types of materials. These meetings would not only provide better feedback about selecting good reference sources,

but would also serve as a form of continuing education. If staff size makes this an unwieldy process, a committee of several librarians with varied subject expertise might be the best alternative.

Whether a committee or a designated librarian has the authority for these decisions is not as important as explicitly designating someone to take charge of the process. Libraries cannot continue to allow a variety of individuals to make haphazard decisions about what the reference collection should be. The reference collection must be actively managed to meet the goals and objectives determined by the reference department.

CONCLUSION

Reference collections serve as subsets of, or surrogates for, the larger world of information and thereby permit users to search for the information they desire in a more efficient and convenient manner. This situation requires reference to be a highly functional collection of appropriately chosen sources, including as many as necessary to meet normal user needs while avoiding excessive complexity. However, the reviewed literature demonstrates that librarians admit to the existence of cluttered, overgrown collections which are all too infrequently guided by well-reasoned collection development policies.

Consequently, it is imperative that those librarians responsible for selection and management of reference collections do two things: first, apply more rigorous thought to the criteria for determining what gets located in those collections; and second, review the collection on a regular, systematic, and aggressive basis in order to determine which sources are appropriate and which merely occupy space and dilute the useful materials. It is possible that the vast majority of reference collections would be significantly diminished in size if these proposed guidelines were actively followed.[37] This, however, will not diminish the effectiveness of those collections. Instead, the leaner, trimmer collection will become more functional; users will find useful sources more easily; and librarians can reclaim valuable space which can be put to other uses.

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Letters

To the Editor:

For John M. Budd and Charles Seavey (*C&RL*, September 1990) to perform a bibliometric analysis of recent library literature by academic librarians is one thing; to infer from this data "a disparity between the rhetoric of the [publishing] requirements and the performance exhibited by librarians at these [academic] institutions" is quite another. Actually, there is a marked disparity between their own research and rhetoric, in part because they misuse a common rhetorical device, synecdoche, by deliberately or inadvertently using the part to (mis)represent the whole.

At Ohio State University Libraries, faculty publications certainly are not confined to journal articles on library science. Are Budd and Seavey unaware that librarians do write books and may even have expertise in areas outside library science? In the past five years, OSU librarians, for example, have published book length research on such topics as Anglo-American relations, American journalism history, single-parent children, the dying child, and public opinion polls, the works of Dov Sadan and Yesha'ayahu Avrech, commedia dell'arte, Ohio archaeology, and a history of a turn-of-the-century Midwestern religious commune, as well as peer-reviewed articles in journals such as the *Bulletin of the American Physical Society, Journal of Pharamacy Teaching, American Journal of Pharmaceutical Education, Journal of Veterinary Medical Education, Journalism History, Fontes Artis Musicae, American Journal of Occupational Therapy, Journal of Teacher Education, Papers of the Bibliographic Society of America,* and *Communication Education.*

As regular university faculty, OSU librarians meet faculty responsibilities in the areas of teaching (defined as their primary job duties), service, and research. As current Chair of the Libraries' Appointment, Promotion and Tenure Committee, I can testify that research leading to publication is a major component of tenure consideration. This does not mean that "anything in print" is accepted as grounds for a favorable decision on tenure and promotion, for the emphasis is on peer-reviewed publications. The demonstrated ability of our library faculty in meeting these requirements indicates that, with strong administrative support, it is possible for librarians to achieve success in research and publication while still providing excellent service and job performance. I doubt that the OSU situation is unique among academic libraries, though Budd and Seavey may well be correct in their conclusion that "academic librarians have a wide range of employment possibilities that do not require publication for continued employment." *Chacun a son goût.*

JAMES L. MURPHY
Head, Monograph Cataloging Section, Ohio State University Libraries

To the Editor:

I would like to comment on the methodology used in the study "Characteristics of Journal Authorship by Academic Librarians" by John M. Budd and Charles Seavey (*College & Research Libraries* 51(5):463–70 (Sept. 1990).

Many academic libraries include health sciences libraries; in the case of the University of Illinois at Chicago, health sciences librarians made up about one-third of the library

faculty during 1985–86. Academic health sciences librarians publish heavily in the *Bulletin of the Medical Library Association*, a highly respected refereed journal excluded from the study. Therefore, the data for ranking most productive institutions, including total credits and per capita figures (p.468), are skewed in favor of libraries without health sciences components. The differences could be considerable in some cases.

TRUDY LANDWIRTH
Health Sciences Librarian, University of Illinois at Peoria

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Book Reviews

Klein, Julie Thompson. *Interdisciplinarity: History, Theory, and Practice.* Detroit: Wayne State Univ. Pr., 1989. 331p. $37.50 (ISBN 0-8143-2087-2). LC 89-035166.

Is there a librarian even remotely concerned with education or research who does not routinely use the word *interdisciplinary*? The selection, classification, indexing, and accessing of library materials are all activities directly concerned with the organization of knowledge. Academic librarians have a ringside seat at the spectacle of shifting departmental boundaries, core curricula, interdisciplinary programs, and research institutes. Librarianship itself is referred to as an interdisciplinary field. But how often do we stop to ask ourselves what the term *interdisciplinary* really means? Is it an organizational structure, a political stance, a process, or an idea?

The label *interdisciplinary*, says Julie Thompson Klein, is rooted in ideas of unity and synthesis: "Interdisciplinarity has been described as both nostalgia for lost wholeness and a new stage in the evolution of science." Klein, a former president of the Association for Integrative Studies, attempts in this book to synthesize the growing literature on interdisciplinarity, and thus contribute to a more unified discourse on a phenomenon riddled with confusion and apparent contradiction.

She begins with a history of interdisciplinary movements from the early twentieth century to the present, and goes on to survey the origins, purposes, structures, ideologies, and practices found in today's international "interdisciplinary archipelago." A clear distinction is made, for example, between the terms *multidisciplinarity* (an essentially additive combination of two or more disciplines, as in many team-taught courses); *interdisciplinarity* (an integration of material from various fields of knowledge into a new, coherent entity); and *transdisciplinarity* (a higher-level conceptual framework, such as systems theory, Marxism, structuralism, or behaviorism, that transcends individual disciplines).

Klein is at her best when she exposes the simultaneous struggle and interdependence between established disciplines and interdisciplinarity. The chapter "The Rhetoric of Interdisciplinarity," for instance, is a brilliant pastiche of the geopolitical imagery of departmental boundary disputes. ("Some will come to rest in the 'bureaucratic foothills of interdisciplinary cooperation' or in designated interdisciplinary programs, the 'Switzerland of academia.' ") There is a perceptive chapter on borrowing between disciplines, with a candid admission of the dangers of reductionism. Also outstanding is the discussion of the activist thrust motivating ethnic, women's, and area studies and of the vicissitudes of these "studies."

Detailed chapters follow on problem-focused research (IDR), interdisciplinary health care, and interdisciplinary education (IDS). The theoretical and practical problems encountered by projects in government, industry, and academia prove to be rather similar, and practitioners in any of these settings can benefit from the experience of others. The book concludes with thoughts on "the interdisciplinary individual" and "the interdisciplinary process," fol-

lowed by a ninety-page bibliography.

As a survey and literature review, Klein's book fills a real need. A vast array of projects is described, from local history to biophysics, American Indian law, ecology, child development, archaeology, American studies, immunopharmacology, urban studies, holistic health care, and undergraduate liberal studies. The book does not, however, quite achieve its goal of synthesis. The material is very compressed; much of it remains only partially digested. Individual chapters adhere to the focus and emphasis of the existing literature on various branches of interdisciplinarity, which can range from recommendations on the best physical layout of office space for interdisciplinary teams to the structure of the universe. Nevertheless, this is a good introduction to an important subject. It answers questions we may not have had the wit to ask and challenges us with problems still unresolved.

The cumulative evidence compiled by Klein suggests a paradox at the heart of the idea of interdisciplinarity. It aims at a holistic, integrating synthesis, an alternative to the fragmenting specialization of modern knowledge. But it has consistently failed to achieve this ideal. One might even argue that, in practice, interdisciplinarity represents the deconstructive, disintegrating force of new perspectives, and that every interdisciplinary project is an ad hoc, temporary solution to a particular problem. As Klein and others openly admit, it may be that modern thought simply defies classification.—*Jean M. Alexander, Northwestern University, Evanston, Il.*

Veaner, Allen B. *Academic Librarianship in a Transformational Age: Program, Politics, and Personnel.* Boston: G.K. Hall, 1990, 520p. $40 (ISBN 0-8161-1866-3). LC 89-27335.

Allen Veaner's book is interesting, worthwhile, and at times exasperating. Although it is intended chiefly for "academic librarians holding or aspiring to administrative positions," Richard DeGennaro rightly observes in his brief foreword that "anyone with a serious interest in the evolution and future of academic libraries" would profit from it.

The first chapter, "The Transformed World of Academic Librarianship," introduces the larger context. Particularly imaginative is the author's description of the traditional academic library as a "manor," a relatively self-sufficient and autonomous entity in which "on-site staff provided services almost entirely from local holdings, custom-tailoring their own bibliographic control systems." In less than a generation, Veaner finds, the academic library has shed its manorial trappings and become part of a community, transformed via "linkages to a vast . . . worldwide array of bibliographic resources and services." The academic library as one-time manor now transformed is an image at once provocative and deserving of further critical reflection.

In his second chapter, "The Academic Community as Institution and Workplace," Veaner correctly observes that "the academic workplace is highly political and strongly elitist, an island of exclusivity in an openly democratic society." But most academics, on most days at least, probably would not share his bleak views of "the viciousness of academic politics. In their relentless and egotistic competition for resources, the faculty manifest bad behavior toward each other that, although refined in execution, is no less savage than that prevailing in the outside world: extreme pettiness, backstabbing, treachery, malicious destruction of colleagues' careers, one-upmanship, and dark and mean-spirited power plays." If this was the environment with which Veaner had to cope during his twenty-six years of library experience at Harvard, Stanford, and the University of California at Santa Barbara, it is no wonder that he left the academy to establish his own consulting firm. The following chapter, "Administrative Theories, Business Paradigms, and Work," contains a number of insightful observations about the nature of library work, who and what librarians are, and the "duality of employment"

between professionals and support staff. Chapters on the administrative challenge and on the library's program are quite useful although here, as elsewhere, Veaner occasionally lapses into the hyperbolic: "Only the highest levels of stamina and stability enable administrators to cope with the work's demands and not lose either their health or their sanity."

Most of the remaining chapters are given over to various aspects of organizational structure and personnel administration. These include organizational communication, governance, duties and responsibilities of staff members, recruitment, performance appraisal, and staff development. Three additional chapters, "Managing Your Inheritances," "Entering and Departing the Administrative Suite," and "The Self: Time, Privacy, and Stress," resemble self-help books in both the content and tone of their advice to would-be academic library administrators; the first of these contains a section on "Building Your Own Professional Image," with subsections on "Voice," "Eye Contact," and "The Role of Touch." The final chapter provides a look at "2000 and Beyond." Throughout, Veaner draws repeatedly on the wider management literature as well as that of librarianship.

In the preface, Veaner warns his readers that they will find "comparatively little advice" about any single function in academic libraries, except for personnel. In this instance he is uncharacteristically guilty of understating the matter. Much more space (though only two pages) is devoted to "references" than to "reference work" and "cataloging" combined, and more space is devoted to "stress" than to "acquisitions" and "collection development" combined. "Circulation" (including all synonyms I could imagine) does not appear in the index; there is, however, an entry for "bull sessions" and another for "headhunters." There is nothing here on bibliographic instruction. One scours the book in vain for details of the transformation identified in the title, or details about the environment which is being

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transformed. The library world one encounters in these pages is one without books or journals, and without buildings. There is some discussion, here and there, of faculty and a few references to students. There is certainly a staff. In fact, for the most part that is all there is. Although traditional views of libraries tended to place too much emphasis on inanimate objects—volumes, furniture, buildings, etc.—Veaner's description reverses the error and gives us the people without an environment. Either omission would be unfortunate in a book with such an encompassing title. Veaner's focus is on the *process* of administering, without much attention to the particulars of the environment that is being administered—one that is popular these days.

The virtues of Veaner's book are several. It is a useful Baedeker to the terrain of academic library personnel issues. The author also provides interesting information about developments and practices in British and Canadian librarianship. In addition, the writing is lively, and Veaner is provocative. I happen to agree generally with a number of his observations. A few of them: "Administration is the unequal allocation of insufficient resources in a consultative but undemocratic style"; "Because librarians are often socialized to a perfectionistic tradition, they are sometimes ill equipped to cope with situations that do not provide all of the desired answers"; "The work of librarians is governed by the professional paradox, 'everything is assigned and nothing is assigned' "; "The giving nature of librarianship may explain, in part, why librarians are not administration minded, have resisted quantification of their work, and have been slow to accept fiscal responsibility for their programs." Each chapter concludes with a list of references and a bibliography so extensive that altogether they consume some 125 pages—one quarter of the total. The index, compiled by Susan Klement, is very good.

As already noted, I occasionally found the book exasperating. Veaner contradicts himself from time to time, exemplified by his difficulty deciding whether the "manorial period" for American academic libraries lasted until the 1930s, the 1950s, or the 1960s (p.3, 429) and by his statement that "since faculty do not generally have job descriptions, neither should librarians," six pages after his discussing, approvingly, the inclusion of certain duties and responsibilities "in each librarian's position description" (p.245, 239). At other times, Veaner is more than simply opinionated; he gives advice as though it were holy writ, and he is not always on target. For instance, he asserts that a "lack of regular, scheduled all-staff meetings simply indicates an uncaring administration unwilling to share information," without admitting the possibility that in some library environments other means of communication may be more effective. Other dubious pieces of unqualified advice: "it would be hard to operate even a small library" if cabinet meetings were not held at least weekly; "if employees are unmotivated it is generally the fault of management"; send a personal letter, not a form letter, to applicants who are no longer being considered for a position; if you want to maintain the status quo, hire a library assistant and don't waste your money on a professional. Moreover, the book would have profited from a stronger editorial hand. On five separate occasions Veaner praises Richard DeGennaro. Considering that it was DeGennaro who authored this book's foreword, such treatment seems excessive. And someone, beginning with the author himself, should have caught the gaffe which finds Veaner mistaking the contents of Hannelore Rader's annual essay on "library orientation" when he recommends it, and it alone, as a source of information for orienting new staff to the workplace. These caveats notwithstanding, the virtues of the book far outnumber its flaws.

Veaner concludes his preface by predicting that sometime between the years 2000 and 2020 "still another book" on academic library administration "will then be required." I would venture a guess, instead, that well before the end

of this century someone, perhaps Veaner himself, will produce such a book with the more inclusive focus of Rutherford D. Rogers and David C. Weber's *University Library Administration* or Guy Lyle's *The Administration of the College Library*. In the meantime, academic librarians will profit from this work, especially if they follow the author's advice selectively and if they balance his portrayal of the land of academic librarianship with the titles noted above and with other reading, including Beverly Lynch's recent *The Academic Library In Transition.—Richard Hume Werking, Trinity University, San Antonio, Texas.*

Academic Libraries Research Perspectives. Ed. by Mary Jo Lynch and Arthur Young. ACRL Publications in Librarianship no. 47. Chicago: American Library Assn., 1990. 271p. acid-free $27.50 (ISBN 0-8389-0532-3). LC 90-32120.

This important book marks a stage in the development of librarianship as a science with an empirical base. The eight essays published here demonstrate that our profession, like other sciences, can build on research. We can cumulate it, replicate it, expand it where needed, and eschew pointless duplication. Moreover, we can apply the findings of empirical research to advance our practice.

What have we learned from research into the functions of academic libraries in the last twenty years? The eight writers here, in chapters on collection development and management (Charles Osburn), bibliographical control (Elaine Svenonius), access services (Jo Bell Whitlatch), instructional services (Mary W. George), bibliometrics (Paul Metz), the application of advanced technology (William Gray Potter), analysis and library management (Malcolm Getz), and management theory and organizational structure (Beverly P. Lynch), characterize, summarize, and direct our application of our research literature. They tell us what research has discovered and what remains to investigate. The bibliographic citations for each chapter, ranging from seventeen (Getz) to 204 (George), also provide us with a map to the research literature.

Compared to other disciplines, the research base for librarianship is relatively new, not very deep, and often unused. Osburn characterizes the research in collection development and management as having started slowly and using diverse methods; as applied, not basic; as pieces of a puzzle; and perhaps ready to move to a new plateau. Lynch observes, "The literature on management of academic libraries is large and diverse, and is comprised, by and large, of expert opinion. Little of this literature has a research orientation. The research that does exist is reported, for the most part, in doctoral dissertations and master's theses. These reports, unless revised and published in the journal literature, have little impact on the field as it is practiced."

Can we incorporate research findings into our work? This book suggests we can and should. For example, Svenonius, summarizing research on the data elements in descriptive cataloging, writes that library patrons use only a few of the data elements in the bibliographic record. "Full-level cataloging, particularly as rendered in the MARC bibliographic formats, is probably wasteful and excessive; it is certainly redundant. The present demand is for simpler and cheaper cataloging." While that demand is justified, she cautions that standards for minimal level cataloging be developed in light of research on all users of the catalog, including serious scholars, and acquisitions and reference librarians, as well as students and casual users.

This book is full of information that we can apply on the job. For example, Whitlatch concludes that, in evaluating the job performance of reference staff, "expert librarian judgment can serve as a substitute for surveying users." Or, we learn that patrons in the reference service tend to "approach staff who [are] standing rather than sitting." Librarians thinking of weeding collections should know that older books and peri-

odicals "that received disproportionate use in their youth will continue to be more popular than their contemporaries as they age."

In addition to provoking us to reexamine our work in light of research findings, the authors provide us with ideas for research that needs to be done. Whitlatch advises, "There are no good studies that look at loss rates across many libraries and systematically identify variables influencing book loss rates." Metz urges that "local library use studies should focus more on the use of periodicals and especially on the surprisingly high use accorded current periodicals." These informed, specific suggestions are far more useful than the research agendas fashionably promulgated by committees.

The authors also identify research that merits replication. According to Osburn, the survey of cooperative collection development programs by Joe Hewitt and John Shipman is "thorough enough to permit inferences about the general status" of cooperative collection development, but it should be repeated with medium-sized and smaller academic libraries. George commends Margaret Steig's study of historians' use of information sources: "No other research on faculty library use approaches this article in scope and clarity. It should be undertaken in other disciplines without delay."

All authors but one identify problems already sufficiently investigated. For example, since we know the low number of subject access points in the catalog is probably inadequate, further inquiries into the number of access points relative to recorded use "do not appear likely to add much to our understanding." Or, unobtrusive studies of one measure of reference effectiveness, accuracy of answers, have provided enough information that there may be no need for additional research on that topic.

Unfortunately, small technical faults mar this exciting book. The lazy title is vague; the occasional weak editing tolerates jargon and, in some places, a lack of synthesis. The citation style for dissertations is inconsistent, and uneven spacing within the notes slows reading. The subject index could integrate the chapters more thoroughly. And the paperback cover quickly kinks up like curly hair on a humid day. One wishes that the production had reached a standard as high as the book's intellectual content.

This book will be useful in library schools, to staff and administrators of academic libraries, and to people doing research. Although each chapter covers one function of librarianship, the readership of each chapter should not be limited to that specialty. Because the bibliographic record underlies all of our work, Svenonius on bibliographic control should be mandatory reading for everyone. Metz offers insights and information on the use of library materials valuable to us all. Potter's clear synthesis of the literature of the last five years on applications of advanced technology will enlighten anyone. The book deserves a wide audience, and, if it prods us to do better research and to apply its results, it will have a great effect in our profession.—*Marcia Pankake, University of Minnesota, Minneapolis, Minnesota.*

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Becher, Tony. *Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Disciplines.* Milton Keynes [England] and Bristol, Pa.: Open University Pr., 1989. 197p. $65 (ISBN 0-335-09221-7); paper, $26 (0-335-09220-9) LC 89-34087.

During the past three decades, an increasingly useful and accessible body of data and theory on the sociology of academic disciplines has been published. Academic librarians should begin to devote closer attention to it. The latest addition to these investigations, written by Tony Becher, a professor of education at the University of Sussex, is clearly presented, neatly structured, well documented—and overpriced—but it is definitely worth reading, especially by those librarians, such as administrators, bibliographers, and public service staff, whose success depends directly upon their ability to comprehend and respond

to the diverse values which drive academic scholarship.

Becher distinguishes at the outset between academic disciplines and the faculty engaged in their pursuit; he then sets out to show how the activities, perceptions, and relationships of faculty in different disciplines are directly affected by a variety of qualities particular to those disciplines. In order to gather the information needed for the book, he interviewed 221 faculty members at eighteen universities in Great Britain and the United States who are engaged in work in twelve disciplines: biology (i.e., botany and zoology), chemistry, economics, geography, history, law, mathematics, mechanical engineering, modern languages (French, German, Italian, Spanish), pharmacy, physics, and sociology. The book does not provide specific, individual analyses of each of these disciplines, but rather uses them as examples of disciplinary types. Becher characterizes and contrasts academic disciplines and their communities primarily by defining and applying four dichotomies. The first two of these, presented at the beginning of the book, are the familiar *hard/soft* and *pure/applied*. In general, the hard-pure disciplines are the natural sciences, the hard-applied disciplines are those such as engineering and pharmacy, the soft-pure are usually the humanities and social sciences, and the soft-applied disciplines are mainly professional areas such as law (and, one assumes, library science).

The chapter on communication, which contains a well-reasoned and highly informative discussion of such topics as collaboration, competition, and the speed and length of publications in different disciplines and specialities, will no doubt be the section of the book of most interest to academic librarians. In this chapter, Becher introduces his third dichotomy of *urban/rural*. Urban specialties are those areas within disciplines in which there is a "high person-to-problem ratio," with all of the attendant fast-paced activity, secrecy, competition, high stakes, and rapid publication, often supported by sub-

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stantial grant subsidies. (A classic example, noted in passing by Becher, was the race to unlock the structure of DNA—the double helix.) The urban specialties are located mainly in the sciences. Rural specialties, on the other hand, are more relaxed, less competitive (but also less collaborative), and offer a sufficient number of research topics for every scholar to lay claim to his or her own area of expertise. Some specialties within the natural sciences are rural, as are presumably all areas of the humanities, social sciences, and the soft professions. Whether a specialty is urban or rural, of course, is reflected in the methods of communication used by the specialty to move around its constituent information.

It is only in the final chapter on "Implications for Theory and Practice" that Becher introduces his fourth major dichotomy, *convergent/divergent*. Convergent disciplinary communities are those with "a sense of collectivity and mutual identity," while divergent communities are "schismatic and ideologically fragmented." All of the energy which the reader has expended in grasping the arguments presented in the first 150 pages of the book is amply rewarded in this final, illuminating chapter, for it is here that Becher synthesizes his information, and artfully weaves together his four dichotomies to reveal some of the major social and conceptual distinctions among scholarly disciplines and communities.

Becher takes special care throughout his book never to oversimplify. He is continuously aware that he is describing individual perceptions and perspectives in general terms, and that variations and exceptions will necessarily occur in particular cases. He never presents his four dichotomies as absolutes but rather, in each instance, as the two end-points of a single continuum, along which different disciplines or disciplinary communities can be located. My only criticism of the study is that it tends to place perhaps too great an emphasis on the sciences. Becher covers all of the main sciences in his twelve representative disciplines, but considers only a few disciplines in the humanities and social sciences. Some of his dichotomies, notably hard/soft, and especially urban/rural, tend to cluster the sciences on one side, and all other disciplines on the other. This limits somewhat the conclusions he is able to draw about the differences among the nonscientific disciplines. Still, one cannot fault this approach too heavily, given the unchallenged centrality and predominance of the sciences among academic disciplines today—and, in any case, it is difficult to say whether Becher's conclusions would in fact have been much different had he delved more deeply into the humanities and social sciences, and had he included such subjects as philosophy, religion, or political science among his sample disciplines.

Most of us in academic libraries have a true subject background in only one discipline; when we enter academic librarianship, we accept a few hackneyed distinctions (scientists use journals, humanists monographs), but then we tend, nevertheless, to generalize our own disciplinary experience, and to imagine that the same qualities characterizing the discipline with which we are most familiar are shared by all disciplines. A careful reading of *Academic Tribes and Territories* will serve as an effective antidote to that affliction, and will do much to broaden the academic librarian's appreciation of the starkly divergent aims and values which underlie the many academic disciplines the research library is called upon to support.—*Ross W. Atkinson, Cornell University, Ithaca, NY.*

Technical Services Today and Tomorrow. Ed. by Michael Gorman. Englewood, Colo.: Libraries Unlimited, 1990. 207p. (ISBN 0-87287-608-X). LC 90-34856.

Michael Gorman has brought together sixteen quality contributions "to examine the present state of each of the major areas of technical services in libraries, to provide individual views on the future of those areas and of technical services in general, and to furnish the reader with

further readings on the topic in question." In this he has succeeded. I am less convinced, however, of his success in providing "a modern version of the classic Maurice Tauber work," *Technical Services in Libraries* (New York, 1954), because the contributions differ so greatly in their focus. Some deal with core topics in technical services; others with interesting byways. Some are firmly based in current operations; others treat the broader issues. This variety does not lend itself to the goal of "presenting a comprehensive picture of the present and future" of technical services. The whole is less than the sum of its excellent parts. Perhaps Gorman set his sights too high.

Several chapters on core topics are among the best in the volume. I have seldom encountered such a concise and clear formulation of basic issues of bibliographic control as in the contributions on descriptive cataloging (Gorman), subject cataloging and classification (Lois Mai Chan and Theodora Hodges), and authority control (Arnold Wajenberg). I would make them required reading for all library school students. On the subject of technical services organization, Jennifer Younger and D. Kaye Gapen predict a paradigm shift as technical services becomes user oriented with emphasis upon effectiveness rather than upon efficiency. At the operational level, Leslie Bleil and Charlene Renner describe the relationships between copy cataloging and the bibliographic networks, while Karen Schmidt treats acquisitions. Marsha Stevenson and Paul Anderson expand their focus—automation of circulation services—to treat broader topics, such as training for automation and the health hazards of VDTs.

Certain contributions cover general issues, albeit with a technical services focus. Norman Brown gives a solid summation of preservation in the research library, a gem worth reading by all academic librarians. William Potter examines the evolving online catalog with its implications both for technical and public services. Susan Rhee deals with budgeting in general before turning to technical services in particular.

The remaining chapters deal with byways in technical services. Among the best is the discussion of gifts and exchanges by Joseph Barker. Edward Lockman treats library book gathering plans (approval plans and blanket orders) with a novel proposal for a national independent reviewing center. Jennifer Cargill has an operationally oriented chapter on accounting practice for the acquisitions budget, while Betsy Kruger deals with serial acquisitions, including the journal pricing crisis. Finally, Robert Burger describes the special needs of Slavic technical services.

I recommend this book for most academic libraries. The contributions are crisply written and pack a lot of information and insight into 200 pages. Even with the diverse contributors, I found relatively little overlap. Each chapter includes footnotes or suggestions for further readings. The technical services librarian should find it profitable to read the book from cover to cover. Other librarians should pick and choose; I would suggest the more general and theoretical chapters to them. Without guidance, the library science student, however, might come away with a wrong impression of the relative importance of various technical services areas because the number of pages is not consistent with the importance of the topic. Michael Gorman has edited an excellent compilation. He has not, however, provided the definitive text on technical services for the 1990s.—*Robert P. Holley, Wayne State University, Detroit, Michigan.*

White, Herbert S. *Librarians and the Awakening from Innocence: A Collection of Papers.* Boston: G.K. Hall, 1989. 382p. $38.50 (ISBN 0-8161-1892-2). LC 88-32652.

Herbert S. White is professor and former dean, School of Library and Information Science, Indiana University. He is also a perceptive and articulate commentator on the library profession. This volume includes thirty-seven articles written by him and published be-

tween 1969 and 1988. (White reports he made this selection from more than one hundred pieces.) With one exception, all the articles have been previously published (sixteen in *Library Journal*) and are thus otherwise available. Five of these pieces received awards either from the American Library Association or the Special Libraries Association.

What gives this volume its value is not only the compilation of the writings in one book but also their organization into four sections: education and training; the internal and external political process; library operations and the library user; and economic issues. White has prepared a general introduction to the volume as well as separate introductory notes to each section. In her foreword, Beverly P. Lynch furnishes an appreciation of White's contributions to the profession. A concluding index is an unexpected bonus, a feature generally not found in an amalgam of separate writings.

In each section the essays are arranged in chronological order. The earliest essay, from 1969, is his inaugural address as president of the Special Libraries Association. Six of the papers are from the 1970s and the remaining thirty from the 1980s. Most from the 1980s are reprints of articles from his "White Papers" series in *Library Journal*. Seven of the articles originated as oral presentations.

Most of the papers are "thought," "commentary," or "opinion" pieces, as opposed to formal research. Only four may be considered research. Three are questionnaire-based studies that originally appeared in *C&RL* and *Library Quarterly*, one on the doctorate in library science (with Karen Momenee as co-author), the second on library school curricula (Marion Paris as co-author), and the third on factors in placing and canceling journal subscriptions. Another *Library Quarterly* article uses the findings of an Indiana University research project as the basis for the further

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examination of the relationships between libraries and publishers.

This volume focuses on education for librarianship, the practice of librarianship, and the management of libraries. But the most important element is the librarian as a competent professional. In the introduction, White gives a good overview of his philosophy and his two principal observations. First, "our success as librarians comes far more from what we are able to convince others to do in supporting our efforts than in what we are able to accomplish by 'dedication,' most specifically by working longer unpaid hours at lower salaries." Second, "it is we as professionals who must ultimately determine what good library service represents" (p. xiv). Indeed, "users cannot be depended on or trusted to understand what they need or what you can do for them until after you have shown them" (p. 317).

White's most important continuing contribution is his emphasis on "the unity of the library profession," the title of one article. To the academic librarian he issues the warning: "Academic librarians are only considered second-rate professors, and more significantly, what they uniquely can contribute as librarians may not be recognized at all" (p. 99). He counsels school librarians not to be "pale replicas of some other profession" (p. 100). Regardless of where you work, White argues, you are a librarian first, and you must assert your unique qualifications and expertise.

One would not sit down and read this book cover to cover. Instead, one dips into it, checking for a provocative title in the table of contents and possibly encountering again a piece read a few years ago in *Library Journal*. The publisher has done an excellent job in presenting these different texts in a uniform and handsome style. Would that all such anthologies were so attractively prepared. One gripe: because it is a selection, some pieces are missing. "The Several Faces of Librarianship," for example, includes a tantalizing reference to an earlier article, "Trouble at the OK Corral University Library." Unfortunately, that earlier piece is not included. Happily, White provides good citations.—*Richard D. Johnson, State University of New York, College at Oneonta.*

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Index to Vol. 51
College & Research Libraries

Prepared by Eldon W. Tamblyn
Portland State University, Oregon

FILING

Filing is word-by-word

ABBREVIATIONS

Standard abbreviations are used except in titles. Names of some organizations, ALA, ACRL, LC, etc., are also abbreviated and are alphabetized as if spelled out.

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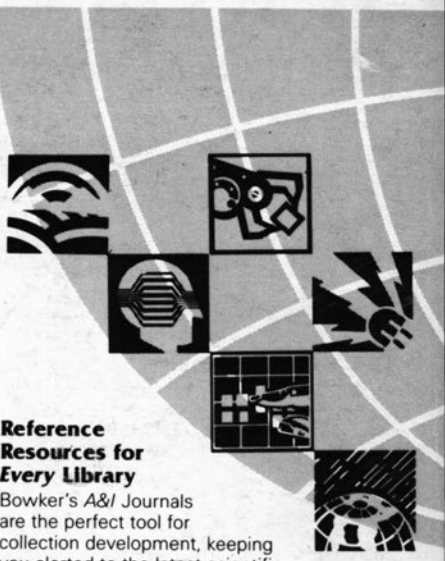

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