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Multidimensional Mapping of Book Circulation in a University Library

William E. McGrath

Circulated books classified according to academic subject areas and student majors were used to determine relative subject similarities in forty academic departments. Multidimensional scaling was used to compute a best-fit solution of the similarities in three dimensions for undergraduate circulation, and two dimensions for graduates. Similarity, or "distances," between departments is shown in two-dimensional maps. The meaning of the dimensions and the tendency of departments to cluster within them is discussed. One dimension can confidently be regarded as "hard-soft," a second may be regarded with much less confidence as "pure applied," and a third is not readily interpreted. Five principal clusters are strongly apparent: quantitative; social services; chemistry and life sciences; humanities; and engineering and earth sciences. Implications for collection development and storage are discussed, including applications for area bibliography, allocation of the budget to departments, organization of the collection, and online retrieval.

In university administration, academic departments are almost universally treated as independent and homogeneous units. Each has a department head, separate budgets, an allotment of faculty, enrollment quotas, objectives, and so on. Academic libraries also recognize this practice, primarily by budget allocation for books.

From a democratic point of view, the system works and is practical. Yet, faculty members are the first to observe that each has interest in or some relationship to the work of other departments. So too, students take courses outside of their major. A political scientist, for example, may assign readings in history, anthropology, sociology, psychology, or other subjects, and will want to be assured that the library has appropriate materials in those areas. This is true to some extent for many other disciplines. One measure of this cross-disciplinary activity is the extent to which students charge out books in disciplines other than their own major. An earlier paper analyzed this cross-disciplinary circulation, defining the extent that students from the University of Southwestern Louisiana (USL) charge out books in disciplines not their major as *ethnocentricity* after Donald T. Campbell,[1] and the extent to which books in a discipline were used by students in other disciplines as *supportiveness*.[2] In that study and in this one, "department" and "discipline" are used interchangeably.

Theoretically, each discipline has something to offer, and accordingly, books in every discipline have some probability, ranging from 0 percent to 100 percent, of being used by the other disciplines. In fact, of the forty-three disciplines analyzed in the USL study, these percentages were wide-ranging, from 0 percent to 70 percent, and 2 percent to 87 percent for undergraduate and graduate ethnocentricity; and 25 percent to 100 percent, and

William E. McGrath is associate professor, School of Information and Library Studies, State University of New York at Buffalo.

13 percent to 98 percent for undergraduate and graduate supportiveness.

If each discipline were to use the knowledge of every other, the total number of ways they could combine or permute is very large, far too many to comprehend individually. Of the forty in the USL study, the number of permutations just two at a time was 1,560. To consider larger permutations—three at a time, or four or five, and so on—is unthinkable. The numbers become astronomical. Actually, the matrix of circulation data for the forty USL disciplines showed a large number of instances in which a discipline showed zero use by others and a few disciplines that were used by many others. Skewness of this sort is to be expected, but not apparent on simple inspection of the matrix combinations because there are so many, and because of the great variability in the extent to which any two disciplines are used by each other. These are the more complex cluster patterns. A well-defined cluster would be one in which all disciplines in it were used by each other to the exclusion of all others. It is these clusters that offer the more intriguing aspects in the exploration of this type of data. Certain quantitative disciplines such as physics, engineering, and mathematics, for example, should cluster. On the other hand, some clusters may be hidden and revealed only by extensive analysis.

Knowledge of these clusters should be highly useful in providing library service, particularly in collection development, allocation, organization, and storage of the collection and perhaps in retrieval from online catalogs.

One could hypothesize, prior to their discovery, about the existence of clusters, such as a physical science cluster, but such hypotheses would be trivial in the sense that such clusters could either be found or not. We know so little about clusters and other hidden patterns that whatever analysis is undertaken (and whether or not explicit hypotheses are stated), findings are certain to uncover new knowledge. Therefore, it would be better to reserve such statements until the actual discovery of clusters.

This type of study is sometimes described as data-descriptive and hypothesis-generating. It is analogous to focusing a new telescope on the heavens and, for the first time, observing nebulae, globular clusters, galaxies, or other phenomena. Their explanation awaits their discovery. Not until then would it be appropriate to formulate and test hypotheses. This paper then is data-descriptive and will focus on the discovery of patterns.

Many studies have been published on patterns of journal use, but few on patterns of book use. In recent years, these journal studies have employed citation data to examine the extent to which one or a group of authors is cited, or one or a group of journals is cited. Most of this research was intended to identify the most highly cited authors or journals, those with the highest impact factor and so on. Some of that research has employed novel ways to uncover patterns, notably the work of Henry Small and Belver Griffith in which they employed co-citation data; that is, the number of times two authors or two papers were cited together to map clusters of authors within a discipline or an invisible college.[3] Their work and that of others has done much to discover internal structure of disciplines and subdisciplines and, to some extent, to identify new disciplines. But little work has been done on the interrelationships among many disciplines from the broad-based organization of a university. Furthermore, little work has been done on the cross-disciplinary use of books as opposed to journals. Yet the largest percentage of use, perhaps as high as 70 percent to 80 percent in some libraries, is with books rather than journals. This is because students constitute the largest population of book users in a university library. Both undergraduates and graduates make heavy use of the book collection, and in most universities undergraduates far outnumber graduates.

To contrast, co-citation analysis examines dynamic patterns of interdisciplinary and cross-disciplinary research, whereas cross-disciplinary book use analysis examines the existing patterns of interdisciplinary content. A simpler way of saying this

is that journals point to where disciplines are going, whereas books describe where disciplines are. Accordingly, this study describes cross-disciplinary patterns at one point at one university as revealed by student book circulation.

METHOD

Two interesting data-descriptive techniques are multidimensional scaling analysis (MDS) and cluster analysis. They are used to reduce large numbers of combinations and permutations to something more comprehensible and to discover hidden patterns of the data. MDS, developed in recent years to a high state of sophistication by Torgerson,[4] Kruskal and Wish,[5] Shepard and others,[6] Schiffman, Reynolds, and Young,[7] et al., is used to map distances computed from similarities data between objects in space in as many as six dimensions.

The objects are located in space by their Cartesian coordinates among the various dimensions. The map will also show any tendency of objects to cluster. Other techniques, such as tree-fitting and hierarchical clustering, can be used to confirm or enhance any clusters found in the MDS configuration.[8] Both clusters and dimensions have meaning and can be submitted to hypothesis testing for explanation.

Multidimensional scaling is sometimes described as a technique in which the statistician is able to regenerate a map showing distances between cities or points while knowing only the mileages between every pair, as in the table of miles in a road atlas. Likewise, a map can be generated whatever the data. In an interesting and innovative paper, Anthony Biglan generated a three-dimensional map from faculty perception of similarities between every pair of academic departments at the University of Illinois.[9] This paper, on the other hand, tabulates similarities between departments using the number of books charged out in each discipline by the students in every other discipline. (See table 1.)

The method of data collection is described in the paper cited above.[10] The data are arrayed in two asymmetric matrices, one 40 × 40 for undergraduates, and one 40 × 17 for graduate students. "Asymmetric" means that data above the diagonal are not the same as data below the diagonal, representing two measures of similarity between each pair of disciplines. In order to obtain a symmetric ma-

TABLE 1
NAMES OF USL DEPARTMENTS AND ABBREVIATIONS

Department	Abbreviation	Department	Abbreviation
Accounting	ACCT	Horticulture	HORT
Agriculture	AGRI	Industrial & Vocational Education	INDVOC
Applied Art	APPLART	Journalism	JOUR
Architecture	ARCH	Management	MGMT
Biology	BIOL	Marketing	MARK
Chemical Engineering	CHEMENG	Mathematics	MATH
Chemistry	CHEM	Mechanical Engineering	MECHENG
Civil Engineering	CIVENG	Medical Records	MEDREC
Computer Science	COMPSCI	Microbiology	MICROB
Economics	ECON	Music	MUSIC
Education	EDUC	Nursing and Health	NUHLTH
Electrical Engineering	ELENG	Petroleum Engineering	PETROLENG
English	ENGL	Philosophy	PHILOS
Finance	FINAN	Physics	PHYSICS
Fine Arts	FINART	Political Science	POLSCI
French & German	FRENGER	Psychology	PSYCH
General Business	GENBUS	Sociology	SOCIOL
Geography	GEOG	Spanish*	SPAN
Geology	GEOL	Special Education	SPECED
History	HIST	Speech	SPEECH
Home Economics	HOMEC		

*Graduate circulation only.

trix, necessary for the MDS computations to take place, the two measures for undergraduate circulation were averaged. For example, psychology majors charged out fifty-four biology books, while biology majors charged out eighteen psychology books; hence the average circulation similarity between psychology and biology is thirty-six. This similarity has meaning, of course, only in relation to the similarities between every other pair. (By convention, when large numbers are taken to mean more similarity, they are called "similarities"; otherwise they are "dissimilarities," as in mileages.) In these data, the number of books charged ranged from 0 to 2,629.

To obtain a symmetric matrix for graduate circulation, every possible pair of majors was correlated. Thus, the input matrix contained correlation coefficients. From these two new matrices, one undergraduate, one graduate, the MDS program then computed "distances" between every pair of disciplines. The program used in this study is called ALSCAL and was written by Young and Lewyckyj.[11] It is available as a package. The Cartesian coordinates obtained from ALSCAL were later used as input data to a cluster analysis program in the BMDP Biomedical Computer Programs package.[12]

In MDS programs, Pythagorean distances are computed in any number of dimensions from one to six, specified by the program user. The several solutions are printed out in two-dimensional configurations. More than four dimensions are rarely needed to explain the data and cannot be visualized in a single configuration. (A three-dimensional solution requires three two-dimensional displays, a four requires six, a five requires ten, and a six requires fifteen.)

The "goodness" or "badness" of each solution is evaluated either by the familiar R^2 or a statistic called STRESS. These two statistics are approximately but inversely equivalent; the larger the R^2 (up to 1.0), or the smaller the STRESS (down to 0.0), the better.

RESULTS AND INTERPRETATION

Preliminary results of this study were reported in another paper by this author in which it was suggested that the Cartesian coordinates of the dimensional solutions might be used as quantitative descriptors to augment subject headings in an online database or for approval plans with book vendors.[13] The data used in that paper have been more extensively analyzed here. Table 2 gives the values for STRESS in three solutions for undergraduate circulation and four for graduate circulation.

STRESS values for undergraduate circulation show steady improvement from two to four dimensions. Improvement drops off sharply from three to four dimensions, indicating that four dimensions do not provide enough improvement to warrant interpretation and probably contain much statistical error or noise.

Clusters

A one-dimensional solution for undergraduates was not obtained. For a large number of objects, inadequacy of the one-dimensional solution can be demonstrated by analogy with a map of the United States. It is not incorrect to say that one must travel 900 miles west to go from Boston to New Orleans. One does indeed travel that many miles westward. But one also travels 900 miles southward. Two

TABLE 2

STRESS FOR MULTIDIMENSIONAL SOLUTIONS FOR UNDERGRADUATE AND GRADUATE CIRCULATION

Dimensional Solution	Undergraduate STRESS	STRESS Improvement	Graduate STRESS	STRESS Improvement
Four	0.188		0.077	
		0.038		0.044
Three	0.226		0.121	
		0.101		0.061
Two	0.327		0.182	
				0.234
One	Not Computed		0.416	

pieces of information, west and south, are needed to show that the best course is along the hypotenuse. Likewise, distances can sometimes be better explained in three dimensions. A trip to Denver, for example, requires traveling one mile vertically, the third dimension in geography.

The two-dimensional solution for undergraduate circulation has considerable pattern, though not entirely satisfactory (see figure 1). Three fairly dense, homogeneous, and well-separated clusters can be seen: a *business* cluster, an *engineering* cluster, and a *mathematics/physics* cluster, with an *English/sociology/history* cluster in the center. The remaining disciplines are more diffuse, and except for several close proximities, the clustering is less apparent. Some anomalies are apparent: journalism and microbiology appear in the math/physics cluster, for example, and biology appears with music and philosophy.

The three-dimensional solution is more satisfactory. The presence of journalism near electrical engineering and other science disciplines (see figures 1 and 2) can be explained by viewing the configuration from another perspective, Dimensions I and III in figure 3, in which journalism now appears with philosophy, music, and others. And in figure 4, journalism appears somewhat off by itself. None of the two-dimensional figures display the clusters in a thoroughly satisfactory way. Figure 2 perhaps best displays their homogeneity, while figures 3 and 4 show them to overlap. Clusters would be best perceived, of course, in a single three-dimensional display.

Labeling of the clusters was helped by the tree diagram shown in figure 5. The diagram, of all forty disciplines, was obtained from the BMDP Biomedical Computer Programs cluster analysis using the Cartesian coordinates of the MDS three-dimensional solution as input data. The tree diagram enhances our comprehension of the clusters by positioning pairs of similar disciplines, subclusters, and larger clusters adjacent to each other. The degree of similarity is indicated by the length of

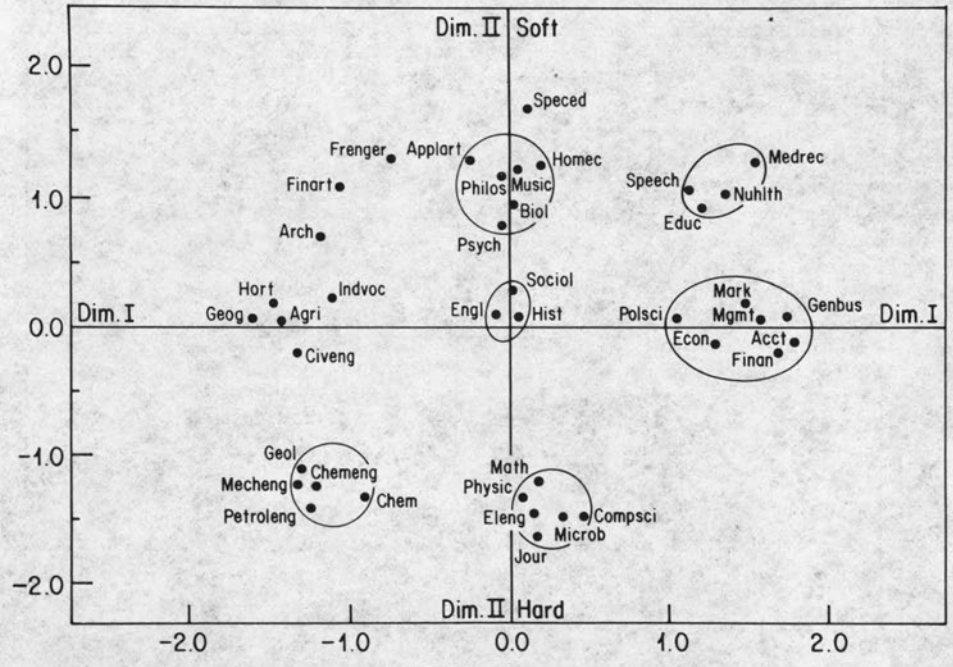

FIGURE 1
Two-Dimensional Map of Undergraduate Circulation, with Tentative Clusters

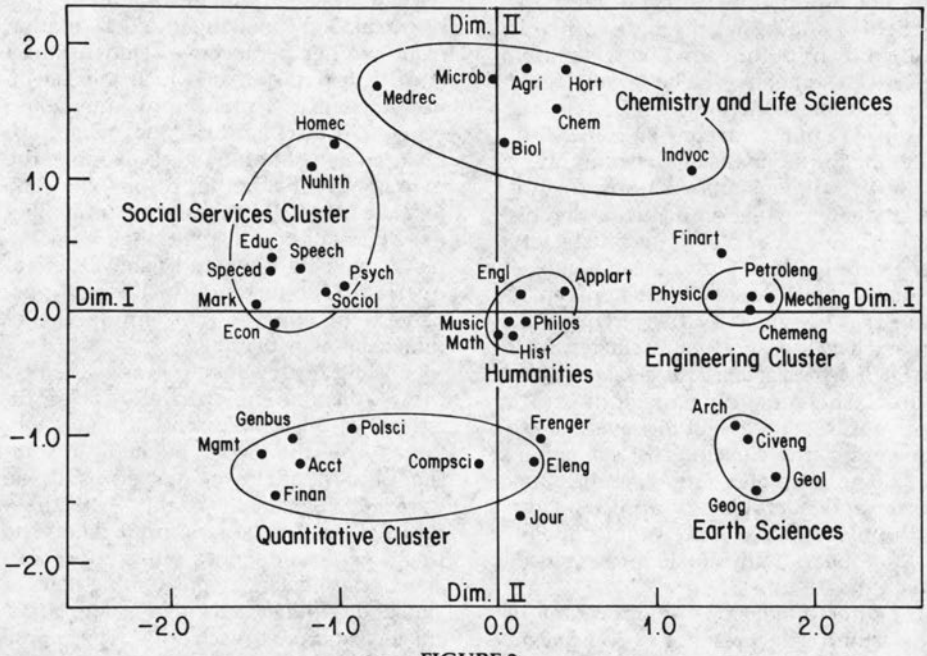

FIGURE 2
Dimensions I and II of Three-Dimensional Undergraduate Circulation, with Improved Clusters

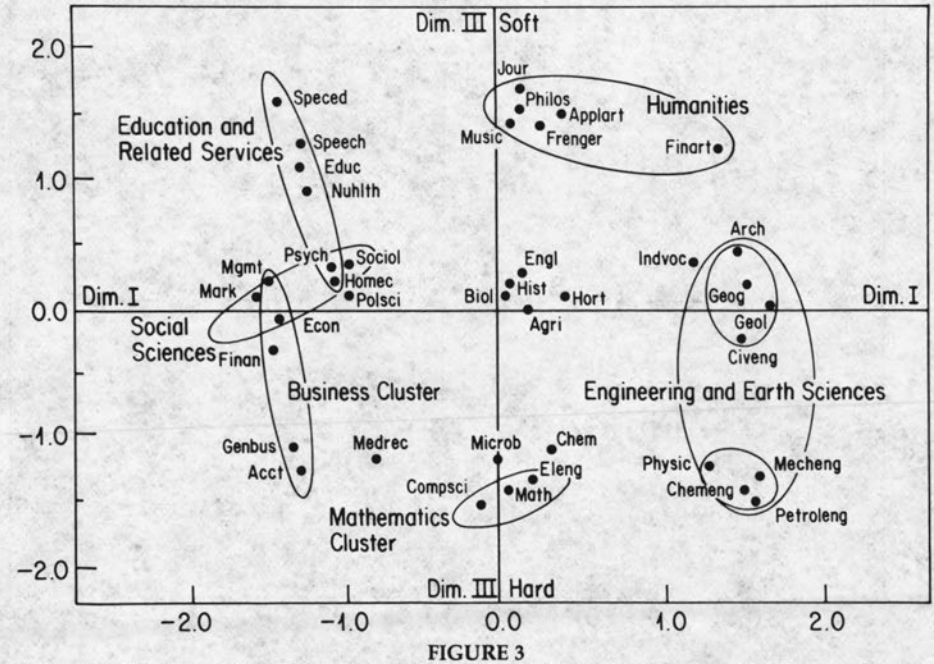

FIGURE 3
Dimensions I and III of Three-Dimensional Undergraduate Circulation, with Overlapping Clusters

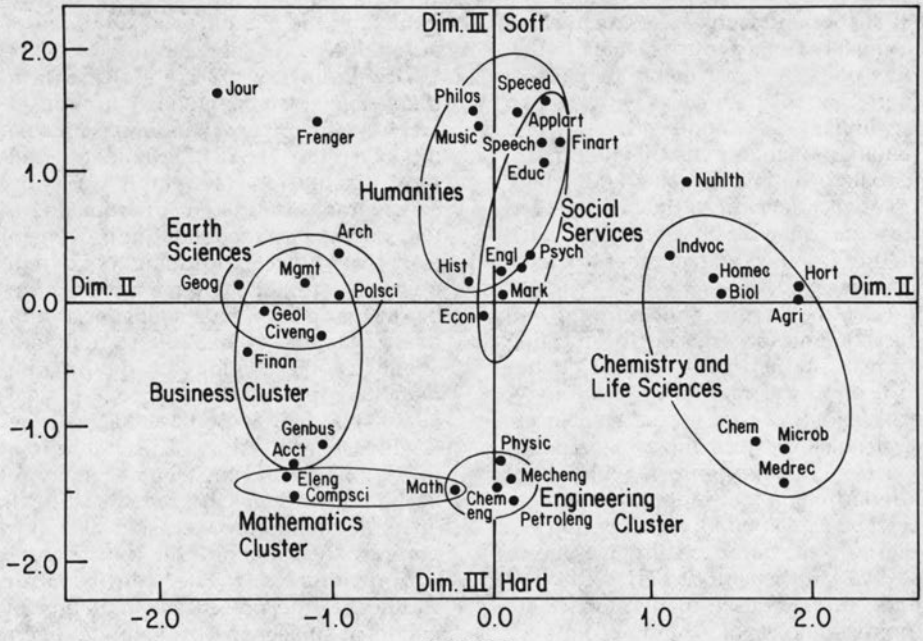

FIGURE 4
Dimensions II and III of Three-Dimensional Map of Undergraduate Circulation, Showing Cluster Overlap from Another Perspective

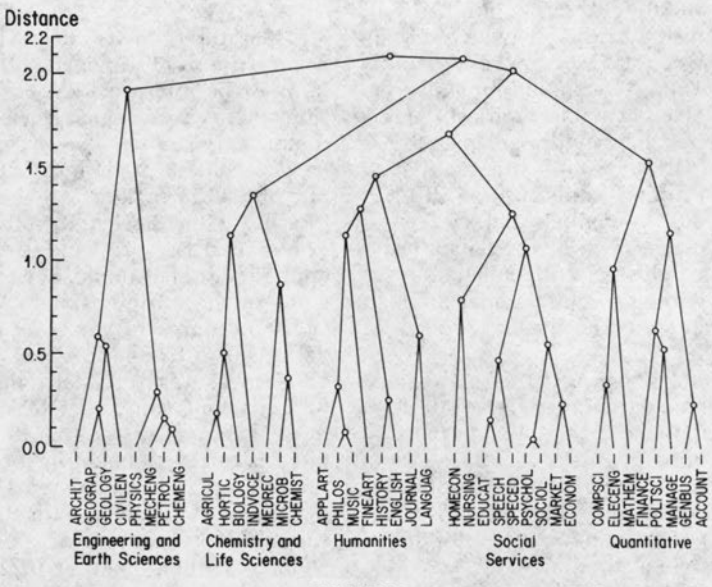

FIGURE 5
Tree Diagram of Departmental Clusters Derived from Cluster Analysis of Three-Dimensional Coordinates of Undergraduate Circulation

the branches and trunks (vertical lines) of each cluster. The diagram is binary in that it joins pairs of departments or pairs of clusters. The diagram starts with the two most similar departments, sociology and psychology. It then joins this pair to another pair, economics and marketing, and so on at each level until they are merged into a large pair-wise cluster, and this cluster in turn is joined with another to form a still larger one.

Note, for example, that nursing and home economics are adjacent to education and are contained in the larger cluster with economics, marketing, sociology, and psychology—that is, social sciences, whereas history, normally categorized as a social science, is grouped with liberal arts departments. These apparent anomalies can be explained by recalling that the similarities are based on the average of "use by" and "use of." Thus, though nursing students used many more home economics books than home economics students used nursing books, they are treated in this analysis as if they were used equally. Also, a great many home economics books were used by other departments in the cluster. Although some improvement of the clustering might be obtained by distinguishing between "use by" and "use of" and by going to four dimensions perhaps, we should remember that we are dealing with empirical data and that the results may bring some surprises. Thus, these results suggest that nursing and home economics, at USL, could be classified with the social sciences in a larger cluster which can be called the social services cluster, and that history should be regarded as a humanities discipline. A summary of the clusters appears in figure 6.

These clusters are not unlike those found by Allan, who counted Dewey decimal classification numbers shared by pairs of academic departments at a midwestern university, then used a critical probabilities method to measure their similarity.[14] Though the correspondence between the author's study and that of Allan's is not exact, the results suggest that similar clusters would be found from one university to another. It would be interesting to explore how and in what context this generalization would take place.

Circulation by graduate students in nineteen major areas is shown in a considerably less complex two-dimensional solution in figure 7. STRESS values for graduate circulation (see table 2) show considerable improvement from one to two dimensions and little improvement from two to three, indicating that two dimensions are quite enough for this number of disciplines. Five simple and intuitively acceptable clusters are apparent: chemistry/microbiology/biology, mathematics/computer science, geography/geology, psychology/political science, and English/speech/history. The simplicity of these clusters and their homogeneity reflect a sharper focus by graduate students on their major, a conclusion also supported in the paper on ethnocentricity and supportiveness.[15] The configuration should be interpreted as circulation by majors in subject space, slightly different than the interpretation for undergraduate circulation, which entails use of each other's materials by any pair of majors.

Dimensions

Just as important as clusters in the analysis of the multidimensional configurations is the interpretation of the dimensions themselves. Biglan labeled his three dimensions *hard/soft, pure/applied,* and *life/nonlife.* That is, disciplines at one end of one of his dimensions can be considered "hard," while those at the other end can be regarded as "soft," and so on for pure/applied and life/nonlife. I obtained measures of these dimensions in an earlier study through a survey of faculty at USL using an entirely different method.[16] Those measures correlated quite well with Biglan's, but somewhat less well with those in this study (see table 3). However, there is one dimension in each of two-, three-, and four-dimensional solutions, that agrees fairly well with the *hard/soft* variable of the earlier USL faculty survey, with correlations of −0.61, 0.72, and 0.44, respectively. (The negative sign is meaningless since it is an arbitrary orientation of the plot.) On the other hand, there are

1. Quantitative Cluster
   - Business: Accounting; General Business; Management; Political Science; Finance
   - Mathematics: Mathematics; Electrical Engineering; Computer Science

2. Social Services Cluster
   - Social Sciences: Economics; Marketing; Sociology; Psychology
   - Education: Special Education; Speech Education
   - Services: Nursing; Home Economics

4. Chemistry and Life Science Cluster
   - Chemistry
   - Microbiology
   - Medical Records
   - Industrial Vocational Education
   - Biology
   - Horticulture
   - Agriculture

3. Humanities Cluster
   - French/German
   - Journalism
   - English
   - History
   - Fine Arts
   - Music
   - Philosophy
   - Applied Arts

5. Engineering and Earth Sciences
   - Engineering: Chemical Engineering; Petroleum Engineering; Mechanical Engineering; Physics
   - Earth Sciences: Civil Engineering; Geology; Geography; Architecture

FIGURE 6
Clusters of Academic Departments Derived from a Cluster Analysis of the Three-Dimensional Coordinates of Undergraduate Circulation

no substantial correlations between Biglan's *pure/applied* nor the earlier USL *pure/applied* and any of the several dimensions in this study—the highest (0.44) is with Dimension I of the four-dimensional solution. There are also no substantial correlations with Biglan's *life/nonlife* variable.

Since both the earlier USL and Biglan surveys were based on perceptions of faculty, neither are empirically based on solid behavioral data, though some significant correlations with behavioral variables have been found. One attempt to validate Biglan's dimensions, by Muffo and Langston, found significant differences in faculty salaries according to *hard/soft, pure/applied,* and *life/nonlife* categories.[17] Biglan himself found significant correlations between his dimensions and scholarly output.[18] This author found low but significant correlations between the *hard/soft* variable from the earlier USL survey and circulation, and between the *pure/applied* variable and student enrollment. No significant correlations were found between *life/nonlife* and other variables in either the Biglan or USL studies.

David A. Kolb, examining data from a learning style inventory associated with the undergraduate majors of 800 managers, found strong similarities between Biglan's *hard/soft* and *pure/applied* dimensions and what he called *abstract/concrete* and *reflective/active* dimensions, respectively.[19] He further supported this association in an examination of extensive data from a 1969 Carnegie Commission of Higher Education study.

The literature of vocational interest also contains studies on the similarities of occupations. Robinson and others, for example, using smallest space analysis, a

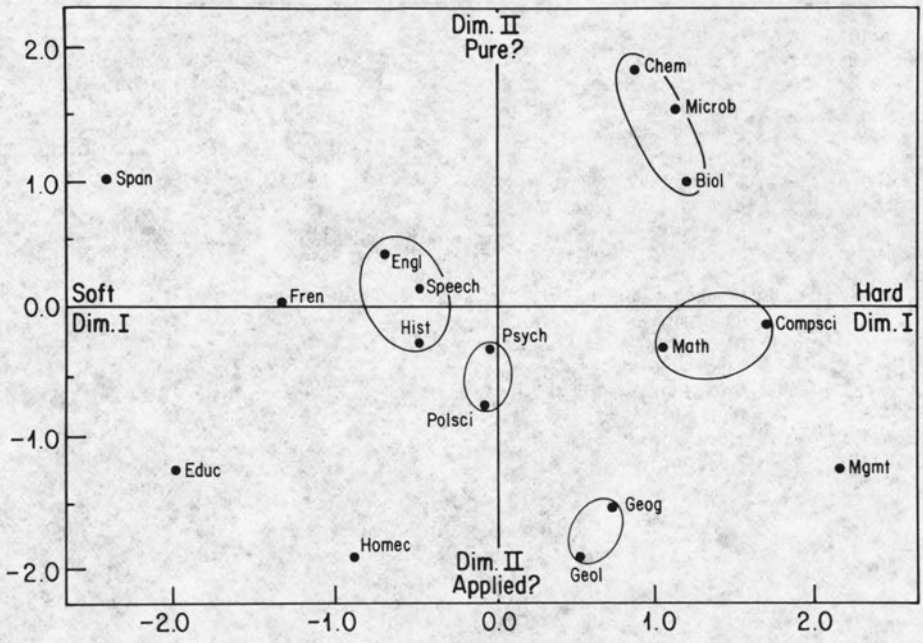

FIGURE 7
Two-Dimensional Map of Circulation by Graduate Majors

technique related to multidimensional scaling, found two strong dimensions in several inventories of occupational similarity, the strongest of which was *object oriented* versus *people oriented* occupations. The other was *doer* versus *thinker* occupations, which included *commercial/business* versus *scientific* components, possibly in a third dimension. They contended, however, that two dimensions were sufficient to explain the bulk of variance.[20]

The dimensions derived in this study, being empirically based, deserve to be interpreted or explained for what they are—not whether they are something else. One of these dimensions, on the basis of correlations discussed above, could be called *hard/soft*, but only if whatever it is that is "hard" or "soft" is measured with behavioral data, as it is in this study. The other two dimensions, though firmly implanted in the data, require further analysis.

Any number of hypotheses could be generated to explain the dimensions, whether they are founded in the literature of learning theory, vocational interest, information science, sociology of science, or library science, but the most immediate explanations in the context of this study would be found in the curriculum—in terms of undergraduate course requirements, and in highly focused majors and electives for graduate students.

Whether or not these dimensions are identified or otherwise explained, and even if they are no more descriptively identified as Dimensions I, II, or III, they should be useful in many ways—particularly if they agree with dimensions found in similar data from other institutions or in a larger database.

IMPLICATIONS FOR COLLECTION DEVELOPMENT AND STORAGE

Area Bibliographers

Ideally, each academic department should have a librarian, expert in that department's subject matter, who would be responsible for collection development. Unfortunately, no library has enough li-

TABLE 3
CORRELATIONS* BETWEEN BIGLAN'S DIMENSIONS
USL CIRCULATION AND USL FACULTY SURVEY DIMENSIONS

		Biglan's Dimensions			USL Faculty Survey	
		H/S	P/A	L/NL	H/S	P/A
USL Faculty Survey	H/S	−0.78	‡	‡		
	P/A	‡	0.78	‡		
	L/NL	‡	‡	0.86		
USL Undergrad Circulation	2 I	0.45	−0.17	−0.09	−0.24	0.17
	II	0.66	0.14	0.53	−0.61	−0.23
	3 I	0.60	0.08	−0.26	0.39	−0.21
	II	−0.16	−0.04	0.57	0.03	−0.07
	III	0.64	−0.02	0.53	−0.72	0.12
	4 I				0.32	0.44
	II		not		−0.09	0.04
	III		obtained		0.62	0.06
	IV				0.44	−0.17
USL Grad Circulation†	I	0.74	−0.08	−0.06	not obtained	
	II	0.40	0.31	0.10		

*Pearson product moment correlations, except as noted, $N = 20$.
†Spearman rank order correlations, $N = 11$.
‡Not obtained.

brarians for such one-to-one assignments. On the other hand, assignment of librarians to areas such as Asian studies, Slavic studies, and the like, may be equally problematic, because they may cover a broad range of unrelated subjects for which the bibliographer may be not as familiar. Furthermore, these "areas" may not correspond at all with real use patterns of the collection. An alternative to these two approaches would be to assign bibliographers to departmental clusters based on circulation, such as those found in this study. Then, every cluster or subcluster could be covered to a hierarchical depth according to the number of bibliographers available. Thus, the "quantitative" cluster could be treated as one cluster with one bibliographer, or as two at the next level deeper with two bibliographers.

Allocation

A major concern of collection development librarians is that allocation to departments may result in too small a budget for some departments and too large a budget for others. Faculty also voice this concern if they feel their allotment does not permit them to request books outside of their own narrowly defined areas. Knowledge of clusters would permit more flexible allocation. Each cluster would receive an allocation with further allocation to subclusters if desired. The denser the cluster—i.e., the more similar each department in the cluster and the further away the cluster is from others, the less critical the suballocation, since whatever books were purchased on a subject within the cluster would have a higher probability of being used by students majoring in any subject within the cluster. But departments that are not obviously part of a cluster should receive an allocation independent of others, because their purchases are less likely to be used by others. If a department is equidistant from all others—i.e., in the center, such as English and history in this study—then the books they purchase have a high probability of being used by students in many departments. Indeed the data show this to be so, and thus they should also receive larger allocations.

Organization of Materials

Storage of the collection according to circulation clusters would be a logical alternative to the existing practice of storage in departmental, branch, or divisional libraries based on campus geography or on the traditional divisions of humanities, science/technology, and social sciences. Books on education and physics may be

housed together for no better reason than that the education and physics departments happen to be in the same building. On the other hand, students in the social sciences are as likely to find many of their books in the humanities division as they are in the social sciences division. Psychology books are stored with philosophy books only because their classification numbers are adjacent in the classification scheme. The divisional arrangement has never been shown to be more effective than single sequence collections, and some libraries have abandoned efforts to maintain them. On the other extreme, separate libraries for every department might be considered ideal by faculty, but are far too costly and inefficient. If a library is forced to break up its collection and if it can afford to do so, then storage of collections according to circulation clusters such as those found in this study would make sense and is worth considering. Such "cluster collections" may be more practical, convenient, and satisfying to faculty and students who complain that "my books are scattered all over the library, and all over the campus, and why can't you librarians bring them together all in one place?" Surely this is a compromisable problem.

Online Retrieval

Circulation dimensions found in this study could be used to augment retrieval in an online catalog. Traditional author, title, subject heading, and call number retrieval is limited in that they are undimensional. Each are capable of describing only one thing about a book. They can not describe other characteristics. To be sure, Boolean logic allows combinations and exclusions of authors, headings, and so on, but still the approach is limited to these traditional tags.

Assuming that the circulation dimensions were valid and generalizable, their Cartesian coordinates could be used as another way to describe books in the collection. This could be done in the cataloging process by assigning coordinates to each book in much the same manner as classification numbers are assigned. A book in computer science might have, say, coordinates of 0.4 and −1.5 for Dimensions I and II, respectively. If it were understood that these dimensions were *pure/applied* and *hard/soft*, then these coordinates would retrieve a "hard" and somewhat "applied" book. In the paper cited above, the author suggested that these dimensions could be used to identify books desired through approval plans, but the question of how books could be assigned coordinates and who would do so is problematic.[21] Also, individual books would not necessarily have the same coordinates as their general subject. That is, one computer science book may be "hard" and "pure" while another may be "soft" and "applied." This would seem to require that further multidimensional analysis be done on each cluster to determine more refined coordinates for each subject within a cluster.

CONCLUSION

Multidimensional mapping and cluster analysis of circulation provides the ability to sort out the complex overlapping interdisciplinary and cross-disciplinary relationships among the academic departments served by the library. The insights gained offer the librarian several new ways in which to enhance library service, and to treat academic departments with more flexibility. The discovered dimensions may provide new theoretical perspective on those relationships. Applications would include assignments in area bibliography, allocation to clusters of departments, organization and storage of the collection, and perhaps in online retrieval.

FURTHER RESEARCH

Clusters and dimensions could be improved by separating data for freshmen and sophomores, who have not yet concentrated on their major, from juniors and seniors. The distinction between "use by" and "use of" should be further explored and separately submitted to MDS and cluster analysis. The dimensions need to be explained by hypothesizing correlations with other likely variables. An at-

tempt should be made to verify and, if possible, generalize the clusters and dimensions discussed here by examining circulation or other data at other institutions and particularly in a large online utility serving many institutions.

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Quantifying the Allocation of Monograph Funds: An Instance in Practice

William McPheron

This paper describes a formula for distributing monograph funds that was developed at a medium-sized university library by a committee of subject specialists working closely with other bibliographers. Relying on a combination of objective data and professional judgment, the method employs a size-of-literature approach to the allocations process but significantly alters traditional versions of that model. Procedural innovations are made not only in the means of establishing the amount and cost of materials relevant to an academic discipline, but also in the manner of using these figures to calculate specific allotments. More radically, need and enrollment factors, characteristically confined to usage-based formulas, are incorporated in order to modify abstract costs by probable levels of local demand.

One of the recurring challenges of academic librarianship is the equitable division of materials budgets among rival subject areas. An active tradition of reporting practical approaches to the task, as well as a growing body of theoretical research on the topic, witnesses the seriousness with which the problem is regarded. When a Collections Advisory Committee was appointed within the Central Libraries system of the University of Cincinnati and charged with developing a formal method of distributing monograph funds, there was, consequently, a pervasive sense of entering a region well populated by competing methodologies. Amid the conflict of ideas characteristic of this territory, agreement does exist, however, on at least one point. This common theme is stated clearly in the RTSD "Guidelines for the Allocation of Library Materials Budgets": "each institution will need to develop its own method for allocation which will apply to its own circumstance."[1]

Recognition of the importance of local conditions usually focuses on the more easily definable aspects of the particular institution. Less frequently acknowledged is the significance of an institution's intellectual and political climate, which always directs, and sometimes dictates, choice among different solutions to a problem. Since the Collections Advisory Committee itself was deliberately constituted to reflect the various elements of the local environment, it was sensitive to differing points of view and concerned to accommodate them. Indeed, there was a general realization that for a new allocations method to command the consensus required for smooth implementation, the technique must not only be consistent in its treatment of objective factors but also

William McPheron is subject librarian for English, American, and comparative literature, Lockwood Memorial Library, State University of New York at Buffalo. Though the paper was personally authored, the development of the formula was a joint effort. The other members of the committee whose work is presented here were: Elizabeth Douthitt Byrne, head, Design, Architecture, Art, and Planning Library; Dorice DesChene, head, Chemistry-Biology Library; L. Ronald Frommeyer, head, Acquisitions Department; Sally Moffitt Neely, reference librarian and bibliographer for history; and Randall L. Roberts, reference librarian and bibliographer for the social sciences—all of the University of Cincinnati Central Libraries.

be congruent with the subjective expectations of the librarians, faculty, and administrators involved.

From the twin necessity of methodological integrity and political suitability, there emerged a quantitative procedure for distributing monograph funds that found widespread acceptance. Its interest at large is twofold. First, it exemplifies how a medium-sized academic library, relying on a representative committee of subject specialists and the cooperation of their colleagues, successfully introduced an impersonal formula into the allocations process. Second, the procedure itself, a tripartite operation, accomplished a major revision of traditional size-of-literature approaches to the division of monograph funds. The initial stage introduces a series of refinements in determining the total cost of monographic literature relevant to academic budget lines. The second stage modifies those cost figures by incorporating need and enrollment factors characteristically excluded from the size-of-literature model. The final stage presents a means of calculating the amount allotted to a budget line in the context of both the adjusted cost figures and prior funding, so that historical inequities relative to other lines are redressed. Tables 1 and 2 illustrate the steps of these stages for two exemplary budget lines, history and biology, and provide the structure for the account that follows.

STAGE 1: ESTIMATING COST OF MONOGRAPHIC LITERATURE

Lines *A* through *E* on tables 1 and 2 constitute the foundation of the allocations procedure, representing the steps by which the total cost of all relevant monographic and other nonserial materials was estimated for each budget line. This amount was figured on a five-year basis in order to compensate for any unusual, short-term fluctuations in the production and expense of library materials in a subject area.

Line A: Current Domestic Monograph Base indicates the number and retail price of monographs pertinent to a line that were published and/or commercially distributed in the United States during the years measured. This information was derived from annual subject analyses of monographs compiled by Baker & Taylor for its domestic approval plan. Prior participation in this plan had provided both familiarity with its coverage and experience with the vendor's application of its own subject terminology. Understanding the latter was particularly important, since Baker & Taylor's subject categories were at once different from and more numerous than local budget lines. This is a familiar dilemma with size-of-literature approaches, for the structure of external production data seldom dovetails exactly with internal accounting organization.[2] To solve the problem, reliance was placed on the judgments of the subject specialists. On the basis of opinions expressed by the selectors and agreements made among them, all the vendor's categories were assigned in whole or part to one or more of the local budget lines.

Table 3 displays the products of this process for history and biology. To calculate the *Current Domestic Monograph Base* for either of these budget lines, the percentages shown on table 3 were applied to the costs of monographs in those subject categories as reported for that year by Baker & Taylor. Each year's *Domestic Base* for every budget line was, in short, a composite figure consisting of varying portions of different subject categories. These annual amounts, entered along line *A* on tables 1 and 2, then functioned as the foundation on which to build an estimate of the expense of all monographic materials relevant to a budget line over the full five-year span.[3] Methodologically, it should be emphasized, these figures stem from a combination of objective data and subjective judgment: verifiable information about the numbers and cost of domestic monographs was rendered locally useful by the exercise of solicited opinion. This mixture is characteristic of the allocations procedure as a whole and contributed to its positive reception.

Line B: Foreign Trade Monograph Factor estimates the cost of commercial monographs published outside the United

TABLE 1
HISTORY

	1975		1976		1977		1978		1979		Total	
	Titles	$	Titles	$	Titles	$	Titles	$	Titles	$	Titles	$
A. Current Domestic Monograph Base	2,079	26,922	1,937	25,635	2,142	28,981	1,870	28,750	2,050	33,808	10,048	144,096
B. Foreign Trade Monograph Factor	7%	1,855	7%	1,795	7%	2,029	7%	2,012	7%	2,367	7%	10,087
C. Non-trade Monograph Factor	10%	2,692	10%	2,564	10%	2,898	10%	2,875	10%	3,381	10%	14,410
D. Non-book Factor	0%		0%		0%		0%		0%		0%	
E. Augmented Base		31,499		29,994		33,908		33,637		39,556		168,593
F. Monograph Dependency Adjustment	98.5% of Augmented Base											166,064
G. FTE Student/Faculty Adjustment	0% Added to Augmented Base after Monograph Dependency Adjustment											0
H. Total Adjusted Base												166,064

	1975/76	1976/77	1977/78	1978/79	1979/80	%	Total
I. Previous Library Support	6,300	7,300	10,300	10,500	48,063		82,463
J. Total Current Monograph Deficiency							83,601
K. % of Adequacy						50	
L. % of System-wide Deficiency						6.8	
M. Recommended Monograph Allocation Supplement							$ 5,649.50
N. Total Recommended Monograph Allocation							$15,013.99

TABLE 2
BIOLOGY

	1975		1976		1977		1978		1979		Total	
	Titles	$	Titles	$	Titles	$	Titles	$	Titles	$	Titles	$
A. Current Domestic Monograph Base	1,479	31,721	1,266	28,690	1,530	36,456	1,302	28,305	1,331	34,746	6,908	159,918
B. Foreign Trade Monograph Factor	7%	2,220	7%	2,008	7%	2,552	7%	1,981	7%	2,432	7%	11,193
C. Non-trade Monograph Factor	10%	3,172	10%	2,869	10%	3,646	10%	2,830	10%	3,475	10%	15,992
D. Non-book Factor	0%		0%		0%		0%		0%		0%	
E. Augmented Base		37,113		33,567		42,654		33,116		40,653		187,103
F. Monograph Dependency Adjustment	84% of Augmented Base											157,167
G. FTE Student/Faculty Adjustment	2.5% Added to Augmented Base after Monograph Dependency Adjustment											3,929
H. Total Adjusted Base												161,096

	1975/76	1976/77	1977/78	1978/79	1979/80	%	Total
I. Previous Library Support	2,515	3,661	3,297	7,230	12,065		28,768
J. Total Current Monograph Deficiency							132,328
K. % of Adequacy						18	
L. % of System-wide Deficiency						10.77	
M. Recommended Monograph Allocation Supplement							$ 8,942.24
N. Total Recommended Monograph Allocation							$13,815.58

TABLE 3
DISTRIBUTION OF BAKER & TAYLOR SUBJECT CATEGORIES

History		Biology	
10%	Religion	10%	Paleontology
100	History	100	Biology
95	History of Specific Areas	100	Biophysics
100	United States History	75	Biochemistry
50	Auxiliary Historical Science	100	Microbiology
10	Geography	100	Physiology
5	Sociology	30	Conservation of Natural Resources
10	U.S. Government	100	Botany
5	International Relations	100	Zoology
20	Military and Naval Sciences	100	Human Biology
10	Labor Economics	10	Medicine
		5	Internal Medicine
		5	Pathology
		5	Health Sciences
		5	Neurology
		5	Agriculture
		10	Agronomy
		10	Horticulture
		10	Forestry
		10	Animal Science
		50	Fish Culture and Fisheries
		20	Veterinary Medicine
		10	Home Economics

States and not distributed domestically, by treating the expense of these foreign imprints as a percentage of a budget line's *Domestic Base*. Because the available subject analysis of foreign book production is not sufficiently detailed, most size-of-literature models do not explicitly account for nondomestic monographs.[4] Yet this neglect risks inequities, since the proportion of a literature's foreign titles varies considerably among academic disciplines. Calculating foreign costs as a percentage of domestic monograph outlays does allow direct compensation for such variations among subject areas.

The actual determination of specific percentages for particular budget lines was based on a series of considerations. The relative importance of foreign monographs in a discipline's literature was established on the basis of subject specialists' judgments. These were elicited through a questionnaire which asked selectors to rate the centrality of the major classes of monographic materials to their fields. Analysis of answers regarding foreign imprints resulted in the placement of every budget line in one of four general levels of dependency. Then, to ascertain the percentages allotted to each of these general levels, the proportions of local monograph budgets actually expended in recent years on foreign monographs were examined to identify ranges corresponding to the levels, and the median of each of these ranges was then taken as a representative figure. Finally, a number of discipline-oriented citation studies, which included data on the frequency of reference to foreign language monographs, were consulted to countercheck the median figures derived from internal acquisitions statistics.[5] Emerging from this process were 0 percent, 2 percent, 7 percent, and 22 percent as the portions of the *Domestic Base* that would be added as the *Foreign Trade Monograph Factor* at each year along line *B* for budget lines at the four different levels of dependency.

These specific figures possess, of course, no external applicability, since they are products of the subjective judgments of particular selectors and local acquisitions data. But the method itself does have independent value as a consistent means of registering variations in the importance of foreign monographs. It also has the advantage of respecting the major differences in the cost of monographs among the disciplines, as tables 1 and 2 il-

lustrate.[6] Both history and biology qualified for a 7 percent foreign imprint supplement; but while the number of domestic titles in biology over the five-year period is only 70 percent that of history, because of the greater expense of biological monographs, the total amount of its *Foreign Trade Monograph Factor* was actually 10 percent higher than the one for history.

Line C: Non-Trade Monograph Factor estimates the cost of those monographic imprints, both domestic and foreign, that are unavailable through normal commercial channels, by again calculating their expense as a percentage of the *Domestic Base.* This category includes not only monographs published by learned societies and professional associations but also nonserial, nondepository titles produced by governmental and other official agencies which must be purchased from monograph funds. Such materials are typically acquired directly from the issuing body and consequently are not usually included in approval plan statistics, such as those from Baker & Taylor. Nor are there other sources of production data that would allow direct measurement of the cost of this type of monograph in specific subject areas. Yet this kind of publication does play a major role in some disciplines, and failure to account for it in a size-of-literature model threatens to penalize those budget lines. By computing the expense of noncommercial monographs as a variable percentage of the *Domestic Base,* different degrees of need for such publications are explicitly recognized.

Arriving at the actual percentages repeated the technique used for the *Foreign Trade Factor* and again involved the evaluation of subject specialists' ratings, internal acquisitions records, and external citation studies. From analysis of this information came 20 percent and 10 percent as the portions of the *Domestic Base* added along line *C* for budget lines with respectively heavy and moderate reliance on nontrade publications. The applied sciences and business were the recipients of the higher supplement, with many of the pure sciences and the social sciences qualifying for lower compensation. Disciplines in the humanities reported virtually no reliance on this material.

Line D: Non-Book Factor is designed to register the cost of another type of library resource that is often purchased for subject areas from their allocated monograph funds but is seldom explicitly acknowledged in size-of-literature approaches. This nonbook category encompasses the complete gamut of print and nonprint formats, but specifically excludes microform reproductions of previously published texts, since these are properly an aspect of retrospective collection development and hence not germane to measuring the total expense of current nonserial production. In the absence of statistics sufficiently detailed to allow direct calculation of nonbook costs to individual disciplines, a percentage of a budget line's *Domestic Base* was again employed to ascertain the amount of the supplementary *Non-Book Factor.* The assignment of exact rates of compensation was, in practice, simplified by the fact that subject specialists reported only one area with a significant need for nonbook materials. The actual percentage of monograph funds expended on such resources by that budget line in the preceding year was consequently adopted and used to calculate its *Non-Book Factor* from each year's *Domestic Base* along line *D.* No attempt was made to construct representative figures, as had been done for the *Foreign Trade Monograph Factor* and the *Non-Trade Monograph Factor.* Local circumstances in which more emphasis is placed on nonbook materials would, of course, require greater methodological rigor in determining each line's *Non-Book Factor.*

One general aspect of this methodology as it applies not only to the *Non-Book Factor* but also to the *Non-Trade Monograph Factor* is problematic and deserves a cautionary notice. By calculating these supplements as percentages of the *Domestic Base,* the cost differentials of domestic trade monographs among the various subject areas are perpetuated. This is an advantage in computing the *Foreign Trade Monograph Factor,* since the prices of domestic and foreign imprints parallel each other; but there is no confirmation of this pattern for nonbook and nontrade items. In the absence of evidence that, for example, a

technical report or videocassette in biology mirrors domestic book prices and so costs approximately 60 percent more than comparable materials in history, the danger exists of overestimating the expense of nonbook and nontrade resources for some budget lines and underestimating it for others.

Line E: Augmented Base is the sum of the *Domestic Base* and its foreign, nontrade, and nonbook supplements. This is entered on tables 1 and 2 for each year monitored as well as for the entire period. The total amount represents an exhaustive budget, theoretically sufficient to acquire all monographic and nonserial resources published during that span of time. This comprehensive figure is the critical one for subsequent stages of the allocations procedure.

STAGE 2: ACCOUNTING FOR LOCAL CIRCUMSTANCES

Lines *F* through *H* adjust the exhaustive *Augmented Base* in light of curricular and enrollment factors specific to the individual institution. Size-of-literature approaches do not typically assess the instructional and research orientations of local curricula in order to estimate what portion of the total body of relevant materials is actually needed for their support. And only occasionally is this allocations model made responsive to differences in the size of student and faculty populations among subject areas. Yet the particular nature of a discipline's local organization as well as the number of people active in its program can significantly affect its practical requirements for monographic resources. The importance of such pragmatic demand in making allocations decisions is, of course, the central premise of a variety of recently developed usage-based models for distributing materials budgets.[7] Their emphasis on usage as the primary criterion for allotting funds enters this allocations procedure in stage two as a secondary element. Here, measurements reflective of probable demand act to modify each budget line's *Augmented Base*.

Line F: Monograph Dependency Adjustment estimates the percentage of the *Augmented Base* that is required to support a discipline as it is locally organized. This figure establishes the extent of a program's need for its full range of monographic resources and thus reflects both the nature of the local curriculum and the orientation of the field at large. Resistance among selectors and their faculties to such a quantified judgment is understandable, since it entails acknowledgment of limits and a retreat from an ideal standard of support. But in the absence of abundant funding, it is important to recognize that degrees of dependence on monographic literature do vary among subject areas.

The *Monograph Dependency Adjustment* serves to account for these differences by establishing the minimum percentage of the *Augmented Base* necessary for adequate support. To determine the size of this figure for a budget line, responses to the collections questionnaire were again used. Subject specialists' ratings of the dependence of their discipline on current monographic resources were tallied for every line. These totals clustered into five groups, and the median number of points scored within each group was treated as representative. This median number was then translated into a percentage and became a group's *Monograph Dependency Adjustment*. For example, history fell into the group that registered 82.7 of the maximum 84 points possible on the questionnaire, which yields the 98.5 percent of its *Augmented Base* brought forward on line *F*; while biology, a member of the group with a median of 70.6 points, was allowed only 84 percent of its ideal monographic budget.

These figures are indicative of local circumstances only, but what can claim general applicability is the concept of introducing projected levels of monographic need into a size-of-literature model by employing these estimates to variably reduce the total costs of disciplines' literature bases. Also of general use is the technique of relying on selectors' professional perception of the orientation of local programs to establish such projections. Though operating without objective data, this technique does inject the specialists' personal knowledge into the allocations procedure at a particularly critical point

and consequently provides a basis on which anxiety about quantifying the process can be shared and resistance to it allayed.

Line G: FTE Student/Faculty Adjustment responds to that type of demand for monographs which is generated by large numbers of people in a program. This kind of usage is presumed to be intense but narrow, justifying the duplication of titles central to a discipline but not warranting the broadening of its literature base as delimited by the *Monograph Dependency Adjustment.* Since its intent is to provide supplementary support for core works, the *Student/Faculty Adjustment* comes after the reduction of the *Augmented Base* on line *F* and is calculated as a percentage of that line.

To identify those disciplines receiving compensation at this point, the number of full-time equivalent (FTE) students and faculty during the preceding five years was compiled for each program. Analysis of this data disclosed four groups of heavy concentration, into one of which about a half of the budget lines fell, the others not showing sufficient density to warrant this kind of support. On the basis of local estimates of reasonable rates of duplication, supplementary amounts of 10 percent, 7.5 percent, 5 percent, and 2.5 percent of their reduced *Augmented Bases* were granted budget lines in the respective groups. Tables 1 and 2 illustrate this operation, with biology receiving the minimum compensation for high enrollment and history not qualifying for any supplement.

Restricting use of enrollment information to predicting demand for duplication is a characteristic principle of size-of-literature models. Less typical is the integration of such statistics directly into the formula in order to adjust the cost of a discipline's base.[8] Yet in some programs the need for multiple copies is clearly greater than in others, and this higher demand does increase, in effect, the overall expense of their monographic requirements. It is this fact that justifies the *Student/Faculty Adjustment.*

Line H: Total Adjusted Base is the sum of a budget line's enrollment supplement and its *Augmented Base* after reduction by the *Monograph Dependency Factor.* This amount represents the minimally adequate monographic budget over the five-year period for a discipline as it is locally practiced. It is this figure that is used in the final stage of the allocations procedure.

STAGE 3: COMPUTING THE ALLOCATIONS

Lines *I* through *N* are the steps by which the *Total Adjusted Base* is translated into specific allocation recommendations. The salient feature of this stage is the use of prior levels of monographic funding as the context for computing each budget line's allotment. Advocates of formulas, whether based on usage or literature size, consistently warn against incorporating such historical precedence, since these earlier budgetary decisions are seldom the products of a rationalized process. While this position commands assent in the abstract, it neglects the practical and political problems posed by concern about funding inequities in the recent past. Where significant imbalances are perceived to have developed in the immediately preceding years, a formula cannot start afresh but must take account of prior funding if it is to correct these inherited discrepancies. The perception of inequities is not uncommon and the need to deal effectively with such a situation prompted the technique of stage three, which allows the calculation of present allocations to account for past practices and compensate systematically for them.

Line I: Previous Library Support records the amounts available to a budget line for the acquisition of current monographic resources during each of the years monitored, as well as for the period as a whole. Monies budgeted for retrospective materials are excluded here, since the purpose is to gauge a line's capacity to purchase the body of literature represented by its *Total Adjusted Base.*

Line J: Total Current Monograph Deficiency is the difference between line *I,* a discipline's actual funding over the period, and line *H,* the estimate of its minimally adequate monograph budget for those years. This deficit measures the distance between the needs of the local program

and the support provided.

Line K: % of Adequacy parallels line *J;* it also compares actual funding with needed funding but presents this relationship proportionally, as the percentage of the locally appropriate budget that was, in fact, furnished. It is at this point that any inequities in earlier allocation patterns will emerge, since major differences in percentages here indicate that the requirements of some disciplines were being met more fully than others. Such an imbalance is evident in tables 1 and 2, with the *Adjusted Bases* of history and biology being approximately equal, but their levels of recent support varying dramatically. The result on line *K* is a 50 percent adequacy rate for history and only 18 percent for biology.

Line L: % of System-Wide Deficiency represents a single budget line's share of the cost of all locally needed but unacquired monographic resources over the period measured. This percentage is a special version of the figure conventionally employed by size-of-literature models to distribute funds. In that approach, a subject area's allotment typically depends on the cost of its literature relative to the expense of the cumulated bases of every field. In this procedure, a discipline's previous support is first deducted from its *Adjusted Base* and entered at line *J* as its *Current Deficiency.* It is, then, the cost of this remaining, unacquired segment relative to the cost of the unacquired segments for all disciplines that determines the division of funds. The greater the discrepancy between a budget line's needed and its actual funding during the previous years, the larger its share of the body of materials still required by the libraries, and hence the higher its portion of present funds. Thus, by making a line's allocation reflect both the cost of its necessary materials and the level of its past support, inequities that occurred in the immediately preceding period are redressed.

This compensatory process emerges clearly on the accompanying tables. The libraries' total of unacquired monographic resources, the sum of every discipline's line *J,* amounted to $1,228,713. History was unable to purchase $83,601 of its materials, which constituted 6.8 percent of the libraries' unfilled needs, while biology's shortfall of $132,328 was 10.77 percent of the system's overall requirements. Although their *Adjusted Bases* are almost identical, because of its relatively lower funding in prior years, biology thus received a 3.97 percent higher allocation than history.

Line M: Recommended Monograph Allocation Supplement reflects a further incorporation of historical precedent. Instead of distributing the libraries' full monograph budget according to the percentages of need entered on line *L,* these figures were applied only to new monies. The resulting amounts were then used to supplement each discipline's allotment from the preceding year, historical funding decisions thus being substantially maintained.

This limited use of the percentages produced by the allocations procedure is not inherent in the procedure itself but was recommended by local considerations. Its effect was to avoid the precipitous reallocation of funds which would have occurred had the formula's figures been allowed to operate on the whole monograph budget. For example, biology's 10.77 percent share would have yielded a steep rise to $22,706, an upward jump of 88 percent over its prior year's allotment of $12,065. Such sudden increases inevitably entail parallel reductions in other budget lines. Even in conditions of abundant funding, this is a difficult move; when there are surpluses nowhere, it can jeopardize acceptance of a quantified approach to the materials budget. In local circumstances where this concern is less prominent, it might be unnecessary to slow the pace at which reassignment of support among subject areas is effected.

Line N: Total Recommended Monograph Allocation is the sum of a discipline's share of new monies, as calculated on line *M,* and the amount of its allocation from the preceding year, as established by prior practice. This final figure is a compromise, superimposing the results of present quantification on past informality. This does, however, provide continuity and consequently assures a smoother transition to the new allocations method.

LIMITATIONS OF THE PROCEDURE

This allocations procedure suffers from several methodological shortcomings that ought to be noted.

1. No provision is made for the preferential consideration of programs accorded high priority. Because disciplines are treated equally within the framework of the formula, a portion of the monograph budget must be reserved for administrative assignment to areas requiring special support.

2. The mixture of objective data and subjective judgment employed in the procedure renders the accuracy of its results questionable. The inevitable imprecision caused by reliance on selectors' opinions is tolerable initially, since their participation in developing the formula encouraged its positive reception. After this introductory phase, more rigorous data is preferable. This does not, however, mean that staff involvement ceases. Indeed, local use and citation studies may provide the best objective information about a discipline's actual dependency on different types of monographic resources, and responsibility for designing and executing these studies resides naturally with the subject specialists.

3. Focus on current monographic resources ignores the need for out-of-print and antiquarian titles. Though determining "retrospective acquisitions rates" is noted in the RTSD "Guidelines" as a problem "not yet handled by any library budget formula,"[9] it is susceptible to solution within this procedure. For retrospective funding could be handled as a supplement to a budget line's *Domestic Base* and, like the other factors in stage one, calculated as a percentage of that base. Computing a line's percentage would require both a numerical measure of a discipline's reliance on retrospective monographs and a statistical account of the adequacy of existing retrospective holdings. The latter figure would serve to define that portion of the universe of retrospective titles presumed to be absent from the collection, while the degree of dependency would establish the amount of those lacking resources which ought still to be acquired. Multiplying the rate of reliance against the proportion of materials required would then yield the relative percentage of a discipline's need for retrospective support. For example, if 80 percent of history's monograph dependency is retrospective—a possibility suggested by a recent study[10]—and evaluation of local resources shows 40 percent of retrospective titles absent, then the product of these figures, or 32 percent, becomes the portion of history's *Domestic Base* that represents its need for out-of-print funding. Its *Augmented Base* would be increased by this amount before the adjustments of stage two are made.

CONCLUSION

At the end of his survey of techniques for distributing academic book budgets, Jasper G. Schad recommends assigning the staff responsible for collection development "the task of preparing an allocation for review by the library administration."[11] The procedure presented here issued from such an assignment and is informed by the attitudes of librarians who daily encounter collection problems familiar to most medium-sized university libraries. The manner of the procedure is eclectic, reflecting the concerns of different disciplines as well as drawing concepts from competing allocation models. Its method is pragmatic, relating general principles of allocation theory to particular circumstances. Though lacking the formal elegance of a mathematical formula, the procedure does possess an unusual inclusiveness of considerations relevant to the allotment of monograph funds. This is a sign of its roots in actual practice and may be the source of its greatest interest.

REFERENCES AND NOTES

1. "Guidelines for the Allocation of Library Materials Budgets," in David L. Perkins, ed., *Guidelines for Collection Development* (Chicago: American Library Assn., 1979), p.33. Jasper G. Schad provides

a convenient survey and critique of published allocations formulas in "Allocating Materials Budgets in Institutions of Higher Learning," *The Journal of Academic Librarianship* 3:328–32 (Jan. 1978).

2. The sources of publishing data employed by different practitioners of the size-of-literature approach have varied widely. William M. Randall, "The College-Library Book Budget," *Library Quarterly* 1:421–35 (Oct. 1931) relied on a printed bibliography, Charles B. Shaw's *List of Books for College Libraries* (1st ed., 1930). William E. McGrath, "Determining and Allocating Book Funds for Current Domestic Buying," *College & Research Libraries* 28:269–72 (July 1967) analyzed an annual cumulated volume of the *American Book Publishing Record, BPR*. Bette Dillehay, "Book Budget Allocation: Subjective or Objective Approach," *Special Libraries* 62:509–14 (Dec. 1971), examined book reviews appearing in major discipline journals, while more recently Richard Hume Werking and Charles M. Getchell, Jr., "Using *Choice* as a Mechanism for Allocating Book Funds in an Academic Library," *College & Research Libraries* 42:134–38 (March 1981), have demonstrated the utility of a single, general reviewing organ. All these involved the problem of relating external information to internal budget-units, and in each case it was resolved by the exercise of informed judgment.
3. Budget lines not identified with academic departments, such as reference and documents, were handled outside the allocations procedure because cost data was not available. For lines with a primary dependence on foreign monographs, such as German and Romance languages, the *Domestic Base* was constructed from expenditure figures provided by university libraries collecting comprehensively in the fields.
4. Randall, "College-Library Book Budget," Dillehay, "Book Budget Allocation," and Werking and Getchell, "Using *Choice*," all appear implicitly to assume that foreign titles are represented in appropriate proportions in the bases they variously employ. McGrath, "Determining and Allocating Book Funds," p.271, does observe that foreign imprints present a special problem and suggests that they "be handled on an *ad hoc* basis."
5. Representative citation rates of foreign language imprints are the following: Herman H. Fussler, "Characteristics of the Research Literature Used by Chemists and Physicists in the United States," *Library Quarterly* 19:128–29 (April 1949) reported 11.8 percent for chemistry and 37.1 percent for physics; Shirley A. Fitzgibbon's convenient survey article, "Citation Analysis in the Social Sciences," in Robert D. Stueart and George B. Miller, Jr., eds., *Collection Development in Libraries: A Treatise*, Part B (Greenwich, Conn.: JAI Press, 1980), p. 291–344, records a range from a high 15 percent (political science) to no use (business administration and education); Richard Heinzkill, "Characteristics of References in Selected Scholarly English Journals," *Library Quarterly* 50:361–63 (July 1980) showed 9 percent.
6. Actually, if the figures for the United States, the United Kingdom, and the Federal Republic of Germany provided by *The Bowker Annual of Library and Book Trade Information* (26th ed.; New York: Bowker, 1981), p.344–45, 351, 352, are analyzed, American hardcover books in the sciences cost approximately 70 percent more than ones in history, biography, and travel. German scientific texts run, however, about 170 percent more than their historical and geographical counterparts, while the analogous rate for British books is an even higher 180 percent. If the bases from which these figures derive are truly comparable, it may be that an additional adjustment within the *Foreign Trade Monograph Factor* is necessary to compensate for steeply higher ratios of differences between foreign book costs by discipline.
7. Most recent work on allocations models has emphasized usage, measured and weighted in various ways. S. K. Goyal, "Allocation of Library Funds to Different Departments of a University—An Operational Research Approach," *College & Research Libraries* 34:219–22 (May 1973), stresses numbers of faculty and students; William E. McGrath, "A Pragmatic Allocation Formula for Academic and Public Libraries with a Test for Its Effectiveness," *Library Resources & Technical Services* 19:356–68 (Fall 1975), relies on circulation figures by subject and average cost of books by discipline; Steven D. Gold, "Allocating the Book Budget: An Economic Model," *College & Research Libraries* 36:397–402 (Sept. 1975), employs the number of student credit hours in an academic department, weighted both by extent of library work required and putative value of the program to the university; R. J. Welwood, "Book Budget Allocation: An Objective Formula for the Small Academic Library," *Canadian Library Journal* 34:213–19 (June 1977), uses three variables—enrollment, circulation, and number of courses—weighted by cost differences among disciplines; Thomas J. Pierce, "An Empirical Approach to the Allocation of the University Book Budget," *Collection Management* 2:39–58 (Spring 1978), focuses on size of departments, local availability of resources, subject characteristics or library orientation of disciplines, and relative price of materials. Schad, "Allocating Materials Budgets," p.329–330, criticizes the basic premise of these models that use in an academic library is predictive of need.
8. Randall, "College-Library Book Budget," p.421, states the standard position that "the number of

students enrolled'' is important ''chiefly with respect to duplicates required for collateral reading.'' Where size-of-literature models do take enrollment into account, for example, Eleanor W. Falley, ''An Impersonal Division of the College Book Fund,'' *Library Journal* 64:933–35 (Dec. 1, 1939) and Don Revill, ''A Book Fund Allocation Formula,'' *New Library World* 75:162–63 (Aug. 1974), the factor is employed to predict overall demand, not duplication needs.

9. *Guidelines for Collection Development,* p.41.
10. Clyve Jones, Michael Chapman, and Pamela Carr Woods, ''The Characteristics of Literature Used by Historians,'' *Journal of Librarianship* 4:147–49 (July 1972).
11. Schad, ''Allocating Materials Budgets,'' p.331.

APPLICATIONS INVITED FOR EDITOR OF *COLLEGE & RESEARCH LIBRARIES*

Nominations and applications are invited for the postion of editor of *College & Research Libraries.* The editor is appointed for a three-year term which may be renewed for an additional three years. Applicants must be members of ALA and ACRL. Qualifications include experience in academic libraries, evidence of research and editing activity, and a broad knowledge of the issues confronting academic libraries.

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Coordinating Collection Development: The RLG Conspectus

Nancy E. Gwinn and Paul H. Mosher

Collection development officers in libraries whose parent institutions are members of the Research Libraries Group, Inc., have a new collection evaluation tool, the RLG Conspectus. *The* Conspectus *is an overview, or summary, arranged by subject, of existing collection strengths and future collecting intensities of RLG members. It serves as a location device for collections considered as national resources and as a basis for assignment of primary collecting responsibilities. The authors trace the antecedents of the* Conspectus *to work of ALA committees, the initial RLG Collection Development Committee, and a group known as GNOMES + 2. Descriptions of the data-gathering process and of the online version of the database precede an outline of the benefits, realized and anticipated, to individual institutions, as well as the partnership. The Association of Research Libraries is conducting an experiment to see if the methodology can be extended to non-RLG association members.*

When Columbia, Yale, the New York Public Library, and Harvard formed the Research Libraries Group, Inc. (RLG) in 1974, they created a rare opportunity for cooperation within the world of research librarianship. RLG was more than just another library consortium. This small community of universities, their libraries, and an independent research library formed a partnership to achieve planned, coordinated interdependence in response to the threat posed by a climate of increasing economic restraint and financial uncertainty. RLG was a group of homogeneous, geographically proximate institutions, similar in goal and function, and with a history of earlier cooperative endeavor. Their commitment to active, mutual support was strong.

In its first years, RLG experienced the withdrawal of Harvard, the addition of Stanford University, and the adoption of the computer-based bibliographic processing system (BALLOTS) developed at Stanford. By the close of 1982, there were twenty-six full, affiliate, and associate members and sixteen special members of the partnership. BALLOTS, RLG's technical processing system, was overhauled, with many of the traumas that accompany large-scale technological innovation, into RLIN (the Research Libraries Information Network), a bibliographic utility supporting many of the functions of its parent consortium.

Following the acquisition of RLIN and the expansion of membership, RLG's other principal programs—collection management and development, shared resources, and preservation—were reconstituted in somewhat different form. RLIN, coupled with central staff access to other resources of the Stanford computer facility, had a substantial impact on the development and operational nature of these programs, and each deserves its own study. For the Collection Management and Development Program, however, the availability of computer re-

Nancy E. Gwinn is associate director of program coordination, Research Libraries Group, Inc., Stanford, California, and Paul H. Mosher is director for collection development, Stanford University Libraries, California.

sources made possible the construction of the *RLG Conspectus*, a collection evaluation instrument to facilitate coordinated collecting activity. This article describes the history, operation, and future of the *Conspectus*.

The *Conspectus* is an overview, or summary, of existing collection strengths and future collecting intensities of RLG members. Arranged by subject, class, or a combination of these, its divisions contain standardized codes that describe collection/collecting levels on a scale of 0 to 5 (with 5 as "comprehensive"). But the *Conspectus* planners also harbored a larger vision. Assuming its successful development, they hoped the *Conspectus* would become the cornerstone of a larger national cooperative effort (one now being studied by the Association of Research Libraries) among all the principal research libraries of the nation, for the eventual benefit of generations of scholars.

The invention of the *RLG Conspectus* derived from the fortuitous conjunction of individuals sharing common interests and goals, the expansion of RLG membership, and agreement that something like a national collection development policy would be necessary to protect the research capacity of the nation's universities from the impact of repeated and unfavorable economic cycles. Using this tool, research libraries could focus collective resources on appropriate distributed but coordinated effort, thus ensuring availability of unique or rare titles to the nation's scholars. To this was added the availability of staff and computer support from RLG. The ideas that eventually were forged into the *Conspectus* can be traced to three sources: GNOMES + 2, groups within the American Library Association, and the initial work of the first RLG Collection Development Committee.

GNOMES + 2

In 1978 at the ALA Annual Conference, a group of chief collection development officers heard John Finzi (now director of the Collections Development Office of the Library of Congress) present a position paper on a "new Farmington plan." Recognizing that no single library, including the Library of Congress, had or could acquire the entirety of world book production, Finzi called for distribution of collection responsibilities both for "exotic" regions or areas and for certain classes of material in other subjects or disciplines. Calling itself GNOMES + 2, this group consisted of the collection development officers of the Seven University Group libraries: Stanford, Cornell, Harvard, Yale, Chicago, Columbia, and Princeton, plus the New York Public Library and the Library of Congress.* A shared concern for the future of research library collections was evident in the room. The group's major worry was how to rationalize the collecting powers of the nation's major research libraries to achieve adequate support for both foreign area studies and subjects or disciplines, for which materials are fugitive or under poor bibliographic control or distribution. In the course of the discussion, GNOMES + 2 members committed themselves to devising an appropriate scheme—analogous to the Farmington plan, but different in scope—and proceeded to carry the idea to other forums.

RLG AND ALA

The chief collection development officers of the four RLG members formed the first Collection Development Committee in 1974. By 1978 their work was providing important practical and theoretical concepts to help shape the growing idea of a nationwide plan. This group forged an initial program that included two key components:

1. The analysis of collection development needs and programs at each institution, the preparation of collection development policy statements, and development of the means to coordinate and rationalize information from the four policies.

*The reference is to the nickname of the Seven University Group who humorously call themselves "gnomes" because they meet in dark and smoke-filled rooms underground.

2. The allocation of "primary collecting responsibilities" for subjects, geographical areas, and forms of material by which a library undertook partnership responsibility for collecting in certain areas.

Primary collecting responsibilities (PCRs) were assigned for publications from countries in Africa, Central America, and Eastern Europe, for intergovernmental agencies and international organizations, and within the fields of architecture and journalism. These PCRs were distributed among members when fields were identified as "non-conflict"—that is, there were no competing or overlapping programs of importance among the member institutions.

The third source shaping the concept of the *RLG Conspectus* derived from discussions and work within various units of the American Library Association. Members of GNOMES + 2 and RLG were active in ALA as well and carried their ideas and commitment to meetings of the Chief Collection Development Officers of Large Research Libraries Discussion Group and of subject specialist sections within the Association of College and Research Libraries, where complementary work was already under way. The RTSD Collection Development Committee, which had begun to prepare a series of guidelines to foster and facilitate management of library collections, included a guideline for the preparation of collection development policy statements with definitions of collection levels adapted from those articulated by RLG (see appendix A).[1] A set of language identifiers modified from RLG was also included.

THE RLG COMMITTEE REGROUPS

By 1979, following the move of RLG's central staff to Stanford, representatives to the revitalized, newly named Collection Management and Development Committee brought to their first meeting a community of shared activities, interests, and goals reflecting both these earlier discussions and developments in their own institutions. Together with strong leadership from David Stam and Paul Mosher, chair and vice-chair, and John Haeger of the RLG central staff, the ideas, activities, goals, and shared products made up the stuff and substance from which the new committee formed its programs. The backbone became the *RLG Conspectus*.

In January 1980 the committee received and endorsed a subcommittee recommendation that "the committee develop an RLG collection policy statement . . . to serve as a vehicle for cooperation with the Library of Congress and other major research libraries in developing an eventual national research resource collection of materials held severally by RLG and other major research libraries, with primary collecting responsibilities distributed among those libraries and LC, and with LC acting as a kind of 'system equalizer' to minimize the impact of local program change on national research library resources."[2] Members further agreed that the coordinated policy statement should carry information on existing collection strengths as well as current collecting intensities.

At the same meeting, the committee brainstormed ideas on the nature of cooperative collection development and agreed to several objectives, the achievement of which would require support by a cooperative RLG collecting policy. They included:

1. The need to identify collection strengths nationally.
2. Mutual reliance and interdependence in providing research materials.
3. Establishment of a tool to identify collecting levels at other institutions, to allow for changes, and to assess their significance.
4. Capacity to control better the physical growth of library collections and operating costs, and to distribute both collecting responsibilities and savings that might result.
5. Development of a mechanism to locate needed research materials more adequately.
6. Rationalization and standardization of format and terminology of local collection development policies to enable libraries to achieve the above goals.
7. Development of a mechanism whereby an institution may store or dispose of locally unneeded materials with

the knowledge and assurance that materials will be available elsewhere.

8. Establishment of a means for relating collection policy to preservation policy, both institutionally and cooperatively.

9. Development of a mechanism for relating collection policy and responsibility to cataloging priorities and for establishing centers of cataloging.

Paul Mosher agreed to develop a proposal for constructing an RLG policy.

"CONSPECTUS" COINED

Three months later, the committee approved the Mosher proposal on the format and content for the RLG collection development policy, to be known as the *RLG Conspectus*. The word "conspectus" was defined as a "breakdown of subject fields in such a way as to allow distributed collection responsibilities for as many fields as possible."[3] This term has received general acceptance as a way of differentiating the national descriptive policy statement now in formation from those of individual institutions. Moreover, the term reflects the distribution of collection strengths and collecting intensities in a way that can facilitate planning, but without the prescriptive implications of a "policy." It was recognized that each participating institution must be left free to create its own policies as local programs and funding permitted; the *Conspectus* was viewed as a means to encourage coordination of those individual institutional efforts for the greater benefit of libraries and their users across the nation, without giving up local autonomy.

The committee also adopted a number of general principles, summarized as follows:

1. The *Conspectus* must be easy to use, flexible enough to meet changing needs, and capable of elaboration in order to treat adequately each field and subfield.

2. The need for specificity in collection strength and collecting intensity would normally be most useful and necessary for fields in which many or most libraries collect at a fairly high level and which involve a wide range and large number of materials, such as medieval history, German history, French literature, or sociology.

3. The Library of Congress classification should form a general framework for the *Conspectus* through the use of its various schedules, but other subject descriptors, outlines, or breakdowns could be used for academic fields not adequately covered by LC.

4. Recognizing that such a complex project as the *Conspectus* might never be fully completed, or might be completed hastily in only a marginally useful manner, it should be phased in at logical stages according to an established timetable.

In determining where to start within the LC classification schedule, the committee used the National Shelflist Measurement Project data as a guide. By starting with fields that reflected the largest acquisition and cataloging efforts of member libraries, the eventual collecting assignments, even partially worked out, would represent a significant achievement. Since linguistics, languages, and literature (class *P*), combined with history (classes *C, D, E,* and *F*) collectively represented 39 percent of all titles held by research libraries, these fields were chosen to start. Subsequent work would proceed through the classification roughly based, in descending order, on the number of volumes represented in research library collections.

At the same time, the committee recognized that work on *Conspectus* segments for area studies programs, such as East Asia, or subjects representing special RLG interests, such as art and architecture, might be undertaken in a parallel timetable if it seemed desirable to do so.

Committee members and RLG central staff worked hard throughout the balance of the year to revise definitions of collecting levels and language codes and to construct work sheets for data collection and a format for data presentation. Ultimately, the committee envisioned an interactive, online format that would allow access to the database by subject, institution, LC class, geographical area, or other useful descriptors, since, in hard copy, the entire document would be several hundred pages long and cumbersome to use.

EAST ASIA EXPERIMENT

While the collection development officers were making their own plans, RLG

established an East Asian program and began to mount a major development effort to build the capacity for handling East Asian scripts in RLIN. Since East Asian vernacular collections are generally housed separately from general research collections yet cover all subject fields, it appeared that a methodology for gathering data about them could be effectively employed. Such a strategy would satisfy twin objectives. As a microcosm of the general collections, problems encountered could be resolved and the methodology revised before a great commitment of time had been made. Secondly, since East Asian materials are often expensive, any data that would help rationalize and distribute the cost seemed worthy of collection.

RLG central staff prepared a broad subject outline based on the Library of Congress classification scheme and asked East Asian librarians to provide separate values on a scale of 0 to 5 to describe existing collection strength and current collecting intensity for materials in Chinese, Japanese, and Korean languages. The experiment was a success. When the values were spread out on a grid, patterns began to take shape that reflected what most curators thought to be true about the relative strengths of their collections. Fear that institutional pride might result in a gross overrating of collection strength proved unfounded. When inconsistencies were spotted, they were resolved through discussion.

Heartened by this experience, RLG central staff, in close consultation with specialized subject bibliographers, began to prepare work sheets to cover other subject areas, and the *RLG Conspectus* became a reality. Immediately, of course, the problem of using the LC scheme to describe today's interdisciplinary research collections became apparent. For example, LC classes *C, D, E,* and *F* describe only one type of history; today's historians regularly use materials in *B* (philosophy and religion), *H* (social sciences), *J* (political science), *L* (education), and other classes in writing social and intellectual history. The same holds true for other disciplines. Studies have shown that some 55 percent of the titles used by sociologists nationwide are given numbers outside of the LC class for sociology.[4]

Initial work sheets therefore attempted to draw from all classes any field that supported research effort in one. The history division, for example, contained a number of lines for reporting from other classes, such as the *H* class for economic history, *J* for constitutional history, etc. Later, as work on the online file progressed, it became clear that this was less important and possibly misleading, since the system could draw together data from throughout the schedule, and the methodology was changed.

By the fall of 1980, data collection was under way. RLG has now collected data for subjects that account for more than 76 percent of RLG libraries' collections. In addition to language, literature, and history, these include: art and architecture, philosophy and religion, most physical sciences, music, economics, political science, sociology, law, and East Asian and South Asian studies. These fields have been collectively divided into more than 2,700 subjects and geographical subdivisions. Provision has been made for brief, informative notes to clarify or enhance specific data by highlighting subject collections of particular strength or problems of assessment. On the drawing board are work sheets for government documents, life sciences, geography and earth sciences, technology, medicine, and Latin American studies. Others planned for the near future are anthropology, psychology, and education.

From the foregoing, it is clear that a "two-track" system of reporting has emerged. In addition to following an LC class arrangement, *Conspectus* segments are being completed for major area studies collections that cut across all classes of knowledge. In part this reflects acquisitions practices, which are often geographically based. But it also recognizes the self-imposed obligation of American research libraries to provide adequate bibliographic coverage for all areas and peoples of the world, a national need that became once again acute following the death of the Farmington plan.

RLG CONSPECTUS ONLINE

Recognizing the complexity and length of the entire document, and the problems that would arise from trying to manipulate its bulk to arrive at needed information, RLG central staff has mounted all of the existing data online, so it can now be readily retrieved. This new interactive database, called the *RLG Conspectus Online,* can be searched by subject, class, collection level, and institution, among other values. The system's flexibility and ease of use greatly enhance the utility of the data. Development work on the database received funding support from the New York Public Library, an RLG member.

If a bibliographer in a northeastern research library, for example, wishes to make a decision as to whether or not to purchase an expensive new multivolume set in the field of European demography, he or she could first search the RLIN bibliographic files to see if any RLG library had ordered it. If no record were found, the bibliographer could then switch to the *Conspectus Online* to look for collection levels in other libraries. Using subject words such as "economic" and "demography," the bibliographer finds a record containing collection data for that field and discovers that Princeton has both a comprehensive (level 5) historical collection and a commitment to continue to collect at that level in a wide variety of foreign languages (5/5W). (See figure 1.) Moreover, as a backup the New York Public Library has both an existing collection and ongoing collecting policy at level 4 (a strong research collection) and a note that indicates an emphasis on English, French, German, Italian, Portuguese, and Spanish languages.

This information has increased the bibliographer's options. It is now possible to decide to depend on Princeton (or NYPL as a last resort) for access to the set under the liberal lending policies of the RLG Shared Resources Program and to use the money that would have been spent for

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(EC029) ECONOMICS AND SOCIOLOGY - ECONOMICS                    PCR:None
 Demography                                                    HB879-3700
--------------------------------------------------------------------------------
     COSG   3/3F
     CSUG   4/4F
     CTYG   4/4F
     CUBG   4/4W
     CUDG   4/4E
     DCLC   4/4W
     ILNG   4/4E
     MAAR   4/4E
     MDJG   2/3F
     MIUG   3/3W
     NHDG   3/3F
     NJPG   5/5W
     NJRG   3/3E
     NYCG   3/3W
     NYCX   4/3F  CCI for foreign materials is 3.
     NYPG   4/4W  For materials in languages other than English, French,
                  German, Italian, Portuguese and Spanish, collecting is
                  limited to bibliographies and indexes, dictionaries,
                  government directories, demography, statistical results
                  of censuses and other statistical reports, and official
                  government gazettes.
     NYUG   3/3E
     PASG   4/4F
     PATG   3/3E
     PAUG   4/4E
     RIBG   4/4F  Demography collection supplemented by departmental library. .
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FIGURE 1
Display from *RLG Conspectus Online* Database

purchases in areas more closely tied to local academic programs.*

Wider-ranging collection decisions could also be influenced by use of the *Conspectus* database. An RLG institution that did not have a high-level academic program in economic demography, for example, could decide to reduce its collecting effort from a present level 4 (advanced research) to level 3 (advanced study), with attendant cost benefit, relying on Princeton's level 5 collection (along with the level 4 collections of other institutions) to answer the infrequent call for such materials from its own faculty and students.

Clearly, one of the advantages of this data-gathering effort is to increase options for local decision making. Within the RLG partnership, the work has led to other benefits, some obvious, but others unanticipated.

Forming Collection Development Policy Statements

Each library contributing data to the *Conspectus* inevitably will construct a complete, useful local collection development policy, representing its future intentions as well as its historical collection strengths. Collection development planning, trade-off decisions in terms of collecting strengths or intensities, and changes in collecting levels suggested by changes in academic programs (or by financial exigency) can much more easily be made, and their impacts understood. Once the local changes are made, RLG central staff can quickly revise the data, and the change is rapidly communicated to all member libraries.

For institutions that already had devised collection policy statements, the conversion to the *Conspectus* was relatively simple. Even so, the process itself has proved to be an effective training aid for staff members, who may greatly increase their knowledge about collections.

Rationalizing Collecting Responsibilities

As each portion of the *Conspectus* is completed, a subcommittee of the Collection Management and Development Committee reviews it in detail. For the present, this initial review focuses on subject areas where there are no research level (level 4 or 5) collections within RLG or where there are only one or two. If there are at least three collections at level 4 or 5 (research or comprehensive) among RLG members, the subject is considered adequately covered. If two or fewer member libraries have research-level collections, it is possible that this is an "endangered" field and that a member should be sought to accept a primary collecting responsibility (PCR). To make such a recommendation about an uncovered or poorly covered field, the subcommittee considers first if a level 4 collection is necessary within RLG or if a combination of level 3 collections, overlapped, may contain a sufficient number of unique titles to equal a level 4 or 5 collection and thus adequately cover the subject area.

The subcommittee then reports its recommendations to the full Collection Management and Development Committee. The library for which an assignment is suggested has an opportunity to explain whether or not it would be likely to accept responsibility for an area. RLG recognizes that local academic programs dictate a library's collection practices to a great extent, and local constraints as well as national needs are considered when a library is asked to maintain a level 4 or 5 collection (or to upgrade from a lower level to a higher one) in the interest of the partnership. Any library may opt not to do so and may then notify the committee that local program or financial problems make it necessary to reduce a collecting level, even if the institution has accepted a primary collecting responsibility. So far the

*As part of the Shared Resources Program, RLG members have committed themselves to give priority to interlibrary loan requests from RLG members and to respond within three days to any request. Members also agree to use the United Parcel Service for shipping and to loan material that has been received but not yet cataloged. No fees are charged among members.

equalizing factors of the other member libraries plus the Library of Congress have been found more than adequate to handle the few cases that have occurred.

Assignment of a primary collecting responsibility to one institution may affect collecting policies elsewhere—or it may not. Faculty and library commitment to support of local academic programs may remain high, even though another institution may possess a larger collection or budget. The level of local collecting activity remains a local decision. The *Conspectus* is intended only to increase local options. It does not dictate local policy.

As part of its analysis, the subcommittee also takes into account the existence of other strong, accessible research collections outside the RLG partnership. While there is consensus that RLG libraries represent a high proportion of available scholarly publications among their 75 million volumes, even their combined holdings plus the Library of Congress do not represent the entire universe, particularly in certain specialties. RLG's present plan is to recognize strengths outside the partnership and to look for eventual collaboration on a larger scale so that these may be taken into account in an expanded national research collecting scheme.

Nine portions of the *Conspectus* have been analyzed and more than 150 PCR assignments made in subjects as disparate as Russian architecture, Chicano literature, Chinese medicine, pastoral theology, and Finnish history. This represents about 20 percent of the fields identified for possible assignment. Assignment of the others was considered unnecessary or postponed for a variety of reasons: (1) the volume of publishing or scholarly interest in the field was minimal (e.g., Manx language); (2) the field was well covered outside of the partnership (e.g., band music); (3) the number of collections at level 3 within the partnership was sufficient (the hypothesis, again, that multiple holdings at level 3 collectively equal a strong level 4 collection);[5] (4) the assignment was postponed pending receipt of data from a member thought to have the strongest collection; or (5) the assignment was postponed awaiting additional information from an area studies segment. Accepting primary collecting responsibility obliges the member institution to continue collecting and processing materials at the level at which the assignment was accepted, to maintain the materials in good condition, and to make them available to other RLG partner libraries within the scope of the RLG Shared Resources Program, unless relieved of the commitment by RLG.

Within this framework, the Library of Congress serves as a kind of equalizer for the system. Should none of the RLG libraries have strong academic programs in the study and history of the Irish or Gaelic languages, for example, and should no member wish to upgrade its collecting to the level considered desirable by members, the Library of Congress has agreed to consider accepting a primary collecting responsibility for that field, possibly even upgrading its collecting activity, in order to provide support for the system. In return, LC looks forward to being able to depend on the collecting responsibilities of other major research libraries within the country and to take those opportunities, when desirable, to cut back on its own collecting in certain areas.

Resource for Reference and Interlibrary Loan

The *RLG Conspectus Online* database is likely to be a rich resource for the interlibrary loan librarian who needs to find and borrow older titles not represented in RLIN or other finding tools. If a location cannot be determined from other sources, the librarian may search the *Conspectus* for a strong collection in the subject and direct the request first to that library. Since the RLG interlibrary loan subsystem allows the requester to define a hierarchy of potential sources for a title, the *Conspectus* can help establish a logical order. If a negative response is received from the first institution queried, the request automatically is sent to the second, and so on.

The reference librarian is likely to find the *Conspectus* of equal utility in directing faculty and graduate students to strong research holdings in subjects out of scope for the home institution. Used this way, the *Conspectus* becomes a practical, gen-

eral guide to a greater world of scholarly resources.

Regional and Specialized National Planning

There are signs that the *RLG Conspectus* methodology is being used, in part or as a whole, as a basis for other efforts at regional or nationwide cooperative planning. Members of the Colorado Organization for Library Acquisitions (COLA), a subgroup of the Colorado Alliance of Research Libraries, use a modified version of the RLG definitions for collection levels as a basis for assigning points to reach a ranked order of expensive items suggested by members for cooperative purchase. (Colorado State University is an RLG member.) Likewise, work sheets for the Japanese portion of the East Asian conspectus division were used by all institutions with significant Japanese collections in the western United States to collect data in preparation for a Western Regional Japanese Library Conference held in January 1982 at Stanford University. Five of the thirteen libraries represented were RLG members. A group of South Asian bibliographers, meeting in conjunction with the annual conferences of the Association of Asian Studies, prepared work sheets for South Asian area studies and are in the process of data revision. The universities of Chicago, Washington, and Wisconsin, all non-RLG members, are contributing to that project. Other initiatives based on *Conspectus*-like activities are developing within SALALM (Seminar on Acquisition of Latin American Library Materials) and among university libraries in Indiana.

In addition to the benefits outlined above, others can be anticipated. As the work progresses, the data may be used to reach decisions for RLG's other cooperative programs, such as shared cataloging and preservation. At least one RLG member hopes to use the data as an aid to fundraising efforts, that is, identifying for potential donors opportunities for gifts and endowments to build or maintain collections of special strength or value as demonstrated in the *Conspectus*. Likewise, the data may help demonstrate to deans and provosts the requirement for funding support to build collections when new faculty appointments are made.

DATA VERIFICATION

As the work on the *Conspectus* has proceeded, the complexity of its compilation and its pioneering nature have, not surprisingly, brought some problems to light. Since there are no adequate quantitative measures of collection utility or excellence, it was recognized from the beginning that judgment and discrimination would be involved in determining collection levels. Comparative shelflist measurement data exists for some libraries according to a more simple Library of Congress scheme, and this data can be of help. However, not every RLG member library contributed to that project, nor does data exist for every subject. Furthermore, the collections of many libraries have been built up over time from bulk gifts, purchases, or exchanges, which may tend to inflate the library's title count, without adding measurably to the quality or significance of the collection.

To help ensure the veracity of the data, therefore, RLG has initiated a program of "verification" and "overlap" studies, which may be used in conjunction with shelflist measurements to guide libraries in assigning comparable collection levels. These studies are designed also to represent the distribution of unique titles and the pattern of duplication among member libraries, which can provide interesting data for further planning of the RLG collaborative effort. The value of these studies was confirmed by a pilot collection evaluation project sponsored by RLG in the summer of 1981. A sample of 1,000 monograph and serial titles in the field of English literature was drawn from the *Cambridge Bibliography of English Literature* and the Modern Language Association bibliographies. These were checked against the holdings of four RLG members—Columbia, Yale, Stanford, and California–Berkeley—each of which had reported a level 4 (research) collection, and therefore could be expected to own the major published source materials required for dissertations and independent

research. If one were to distribute the five levels of the scale evenly by percentage of holdings, an institution reporting a level 4 collection should be expected to hold between 70 and 85 percent of the titles considered important. The results of this study showed holdings that ranged from 76 to 86 percent of the titles searched, illustrating not only the accuracy of the reports, but that some collections were slightly undervalued (see table 1).

Of more interest and perhaps comfort to scholars and librarians alike, was the fact that aggregation of results demonstrated that fewer than 5 percent of the titles checked were not found at any of the libraries. The value of this kind of verification and overlap study became clear to the Collection Management and Development Committee at once, and fifteen other members have replicated it. The data has already proved useful in bringing about greater accuracy of reporting of collections and better understanding of their relative quality. Instruments have been designed for three additional verification studies—in French literature, Swiss history, and mathematics—and others are in the early planning stages. All of the studies use a sampling technique common in collection evaluation studies.[6]

Another problem with the data as it presently exists involves the use of language codes, which, no matter how much they are worked over, never are capable of precise application (see appendix B). The importance of consistent use was recognized only after analysis of the initial portion of the *Conspectus* began. Some institutions had not at first supplied these codes, and others used them only sporadically. As the value of the codes in distinguishing collection strengths and in assigning collecting responsibilities became clearer, their accurate use was stressed. Earlier data eventually will be upgraded, using subsequent reports from member libraries to bring about greater consistency and thus better understanding of the result.

Overlap of the portions of the *Conspectus* organized by subject with those organized by geographical area also requires attention. The South Asian area studies work sheets cover all subjects, for example, and subdivide them by country. But these subjects, and occasionally similar geographic subdivisions (in history, for example) occur in other parts of the *Conspectus* at varying levels of detail. Now that the *Conspectus* is available for searching in an interactive mode online, areas of overlap can more easily be monitored and adjusted to prevent inconsistency in reporting data. Finally, the process of gathering data has revealed the need for revision and refinement of subject breakdowns in some areas to make them more useful. RLG anticipated this but decided to postpone the revision process until data had been gathered for all subjects scheduled.

THE ARL TEST

During the past year, the Collection Development Task Force of the Association of Research Libraries has been studying "current commitments and possible approaches to national cooperation in building and maintaining in-depth collections in specialized areas."[7] In pursuit of that end, the task force initiated a project to explore the potential benefits to the association's libraries of using the RLG format to create a national collection development policy or conspectus.

Five volunteer test libraries from ARL (Iowa State University, the University of Notre Dame, the University of Manitoba, the University of Cincinnati, and the University of Wisconsin) gathered and submitted data for the subjects of religion and philosophy, chemistry, and economics. RLG staff processed the data and produced printouts for ARL on a cost-recovery basis. In January 1982, members of the task force and staff of the test libraries and RLG member libraries met to discuss methodology and results as well as the possibilities, issues, and problems presented by such a project undertaken at the national level. Subsequently, the ARL Collection Development Task Force recommended that the test libraries develop a set of verification and overlap studies for the three test subjects similar to those used by RLG. The work was completed late in 1982; the task force will review results and make a recommendation to the Association of Research Libraries on

TABLE 1

COLLECTION ANALYSIS PROJECT IN ENGLISH LITERATURE
RESULTS OF REPLICATION AT RLG INSTITUTIONS—BY NUMBER OF TITLES, PERCENTAGE HELD, AND REPORTED COLLECTING LEVEL (CL)

Section of Bibliography	Total Titles	NNC			CtY			CSt			CU			NN		
		#	%	CL	#	%	CL	#	%	CL	#	%	CL	#	%	CL
Old and Middle English*				4/4			4/4			4/4			4/4			4/4
General Old English	111	88	79.3		97	87.4		84	75.7		92	82.9		85	76.5	
Langland	97	72	74.2		89	91.8		70	72.2		81	83.5		74	76.2	
Renaissance Drama				4/4			4/4			4/4			4/4			5/5
Jonson	118	102	86.4		108	91.5		94	79.7		94	79.7		105	88.9	
Marlowe	97	80	82.5		79	81.4		77	79.4		79	81.4		82	84.5	
18th-Century Prose				4/4			4/4			4/4			4/4			5/5
Swift	133	108	81.2		118	88.7		105	78.9		111	83.5		107	80.4	
Godwin	80	60	75.0		66	82.5		51	63.8		59	73.8		63	78.7	
19th-Century Fiction				4/4			4/4			4/4			4/4			5/5
Austen	94	68	72.3		80	85.1		76	80.9		79	84.0		80	85.1	
Gissing	74	61	82.4		65	87.8		66	89.2		59	79.7		69	93.2	
20th-Century Poetry				4/4			4/4			4/4			4/4			5/5
Auden	138	108	78.3		121	87.7		98	71.0		118	85.5		121	87.6	
Gunn	31	21	67.7		15	48.4		18	58.1		27	87.1		26	83.9	
Total	973	768	78.9	—	838	86.1	—	739	76.0	—	799	82.1	—	812	83.5	—

*Representative authors were selected as examples of the subject; the collection level (CL) is for the entire subject, e.g., Old and Middle English.

whether to adopt the *Conspectus* format as the basis of a truly national research collection development statement.

The efforts of RLG and ARL have gone a long way toward realizing the dream of many librarians for a description of existing research collections nationwide in areas of interest to scholars all over the nation. The development of a national conspectus is a project of potential significance approaching that of the development of the National Union Catalog of past generations. Through this effort, scholars and librarians everywhere will have a better concept of the location of major research collections. By understanding existing patterns of strengths, and by distributing responsibility on the basis of collaborative self-interest, the research libraries of the nation may develop even stronger research collections with less undesirable redundancy and unnecessary expenditure. But it will not be an easy or simple task. To work, interdependency must be carefully laid on a foundation of enduring mutual commitment and trust, commodities that have not always been easy to obtain.

In a sense, the *Conspectus* represents an insurance policy against future uncertain times. This new vehicle should provide the means for improved service, as well as enabling trade-off and reallocation of resources in ways that will result in local economies. The project will give to librarians and scholars a bibliographic research tool on a grand scale that will make efforts at bibliographic access and rapid delivery more efficient and effective than ever before.

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APPENDIX A: RLG DEFINITIONS OF COLLECTING LEVELS

0. *Out of Scope:* The library does not collect in this area.
1. *Minimal Level:* A subject area in which few selections are made beyond very basic works. For foreign law collections, this includes statutes and codes.
2. *Basic Information Level:* A collection of up-to-date general materials that serve to introduce and define a subject and to indicate the varieties of information available elsewhere. It may include dictionaries, encyclopedias, selected editions of important works, historical surveys, bibliographies, handbooks, a few major periodicals, in the minimum number that will serve the purpose. A basic information collection is not sufficiently intensive to support any courses or independent study in

the subject area involved. For law collections, this includes selected monographs and loose-leafs in American law and case reports and digests for foreign law.

3. *Instructional Support Level:* A collection that is adequate to support undergraduate and *most* graduate instruction, or sustained independent study; that is, adequate to maintain knowledge of a subject required for limited or generalized purposes, of less than research intensity. It includes a wide range of basic monographs, complete collections of the works of more important writers, selections from the works of secondary writers, a selection of representative journals, and the reference tools and fundamental bibliographical apparatus pertaining to the subject. In American law collections, this includes comprehensive trade publications and loose-leafs, and for foreign law, periodicals and monographs.
4. *Research Level:* A collection that includes the major published source materials required for dissertations and independent research, including materials containing research reporting, new findings, scientific experimental results, and other information useful to researchers. It is intended to include all important reference works and a wide selection of specialized monographs, as well as a very extensive collection of journals and major indexing and abstracting services in the field. Older material is retained for historical research. Government documents are included in American and foreign law collections.
5. *Comprehensive Level:* A collection in which a library endeavors, so far as is reasonably possible, to include all significant works of recorded knowledge (publications, manuscripts, other forms), in all applicable languages, for a necessarily defined and limited field. This level of collecting intensity is one that maintains a "special collection"; the aim, if not the achievement, is exhaustiveness. Older material is retained for historical research. In law collections, this includes manuscripts, dissertations, and material on nonlegal aspects.

APPENDIX B: RLG LANGUAGE COVERAGE CODES

E— English language material predominates; little or no foreign language material in the collection.
F— Selected foreign language material included, primarily European, in addition to the English language material.
W— Wide selection of material in all applicable languages.
Y— Material is primarily in one foreign language.

Library Use Patterns among Full- and Part-Time Faculty and Students

Jo Bell Whitlatch

Trends in higher education are toward part-time students and majors in professional fields which are associated with low library use. Research findings at San Jose University, California, and other academic libraries, demonstrate that declining library use may be a future trend. Declining use will further erode administrative support for library budgets. Libraries must become more effective in identifying and meeting the information needs of new nontraditional students. User surveys establishing service priorities can be an effective tool in planning library service for future student and faculty populations.

Speculation concerning the future of libraries has often focused upon the advent of the "paperless society" and the effects of library automation. However, another trend may have a much more immediate and traumatic effect upon libraries in our universities. Several recent trends in higher education enrollments require the academic library to reassess services to a student body no longer composed primarily of full-time students obtaining liberal arts degrees.

Enrollments in universities and colleges in the nation have been shifting toward the professional fields, particularly business and engineering, which rely less on literature and more on experience and handbooks. In the future, several fields are expected to show significant increases in the number of bachelor's degrees: computer and information sciences; business and management; communications; engineering and engineering technologies; health professions; and agriculture and natural resources. Decreases are expected in education, social sciences, letters, library science, mathematics, and statistics.[1]

Full-time white males are now a student minority. Participation in higher education by members of subgroups other than white males has been increasing,[2] and over the past decade there has been a rise in the number of part-time students at our universities.[3]

Many library studies have demonstrated that libraries are not, and never have been, regularly used by most people. A number of public library user studies have found that the public library is an institution used by a minority of people.[4] Less well known is the fact that academic libraries also tend to be used by a minority of students. A recent study at DePauw indicates that 40 percent of the student body did not borrow a single library item during the semester[5] and that 10 percent of the students accounted for almost half of the circulation of all library materials.[6] Survey results from several academic libraries show that a consistently high percentage of students (from 10.8 percent to 63 percent) do not make use of the library facilities.[7]

Surveys also indicate that the faculty heavily influences student use of the library. Studies by Lolley, Naylor, and Lu-

Jo Bell Whitlatch is access division head, San Jose State University Library, California.

bans have concluded that the majority of faculty do not expect students to use the library. There is heavy reliance on textbooks and class-distributed materials.[8] Courses that predominantly involve skill development require materials that are readily accessible to the classroom, laboratory, or shop.[9] The lack of emphasis on library use in the curriculum at the freshman and sophomore levels has been shown to be the major reason why student use of the library is low in the first two years and increases with advances in class standing.[10] Knapp's study reported that one-quarter of the courses in college accounted for 90 percent of library circulation.[11] A study by Lubans indicates that a much higher percentage of users (40 percent) than nonusers (19 percent) believe that professors encourage students to use the library.[12] Past studies usually have shown that it is possible to do acceptable college-level work without using the library's resources.[13] Hardesty has noted that students appear to be using (or not using) the library to the same degree they did more than forty years ago. Classroom teachers have not significantly changed their views toward the library, and librarians have been largely unsuccessful in influencing classroom teachers.[14]

Despite important innovations in library services such as bibliographic instruction and online literature searching, and as enrollment and faculty changes move toward disciplines not relying heavily upon the library for information, library use can be expected to decline in the future. Chen and Hernon believe that the library has lessened its position as an information source by failing to "service knowledge consumers' most basic needs." This undermines the library's claim to public funds.[15] Without a more complete understanding of the patterns of information need and fulfillment, libraries cannot compete with other information providers in the struggle for survival. The alternative to competition and adaptation is irrelevance, disuse, and organizational decay.[16] Axford has noted that the serious funding problems of the next decade will inevitably lead to some management concepts infiltrating the budgeting and planning process at all levels of higher education. The most obvious example of this would be market principles that underlie the reluctant shift of resources from the traditional liberal arts programs to the professional schools—the inevitable consequences of enrollment pressures and student-driven budgets.[17]

Specifically, data collected in a study at San Jose State University demonstrate that there are significant differences between part-time and full-time faculty and student use of the library, with part-time students and faculty using the library less. There are also significant differences in library use between faculty and students from the different academic disciplines. Significantly smaller proportions of students and faculty from the professional schools use the library. Data collected in the San Jose study not only confirm the major findings of most of the earlier user studies, but also suggest that enrollment trends and faculty hiring patterns will tend to make the library even more of a "minority" institution on the campus.

San Jose State University is one of the nineteen institutions of higher education in the California State University System. The principal function of the California State University System is to provide both undergraduate and graduate instruction (through the master's degree) in the liberal arts and sciences, in applied fields, and in the professions. San Jose State is one of the larger institutions in the system with 25,000 enrolled students (20 percent are graduate students) and 1,753 faculty (900 are tenured or tenure track). Graduate instruction is offered in more than fifty fields. San Jose State is located in the large metropolitan San Francisco Bay area, with a student body sharing many common characteristics of other urban campuses. Many of the students come from nontraditional student populations: poor and lower middle class, older, married, minority and ethnic groups, and students with jobs. At San Jose 40 percent of all students are part-time, with this proportion remaining relatively constant over the past several years. Across the nation the percentage of all faculty members who are employed part-time increased from 22.4

percent in 1968 to 31.2 percent in 1978.[18] In the seventies the proportion of part-time faculty also rose steadily at San Jose State. However, due to declining enrollment and high levels of tenured faculty, in the past two years the proportion of part-time faculty has dropped from the 1977/78 high of 37 percent to 27 percent in the spring of 1980. The student body at San Jose reflects the trends in future student populations in urban public universities. Following national trends, 20 percent of all San Jose students are majoring in business; 13 percent in engineering; and 16 percent in applied arts, which includes such areas as nursing, health science, administration of justice, recreation, and journalism. Only 30 percent have majors in the schools of humanities, social sciences, and science. Of the 60 percent tenured faculty at San Jose, more than half have their primary teaching service areas in the schools of humanities, social sciences, and science: only 10 percent are in engineering; 10 percent in business; and 15 percent in applied arts. The library houses 700,000 bound volumes, plus additional microform, media, and curriculum collections.

Because San Jose had been planning a new library which opened in February 1982, the university authorized the 1980 student and faculty library user surveys in order to assist the library in collecting information regarding student and faculty research and information needs. Student and faculty perceptions concerning the adequacy of library services were useful in planning the new Clark Library. Library "use" and "users" are not well defined. A variety of measures, such as items borrowed, items used in the library, interlibrary loan requests filled, and reference questions answered, have been used to represent "use." "Users" have been represented by terms such as registered borrowers, or persons actually borrowing materials. This study uses a self-report on the frequency of library visits. To obtain data on "general use" of the library, students and faculty were asked how often they usually used the library during a semester. Two other questions were asked of library users through the survey. Respondents were asked if they were satisfied, dissatisfied, or had never used specific library services such as circulation, periodicals, reference, and government documents. Respondents were also asked if they used other libraries in connection with their San Jose State course work (for students) or teaching and research (for faculty). Therefore, the library user study provided an opportunity to examine the library and responses from its primary community based upon present services offered.

Students numbering 1,470 (5.9 percent of the total student body) were surveyed through a questionnaire given to a random sample of classes. The Testing Office of the university used a standard procedure to obtain the random sample: a schedule of classes in code number order was provided by computing services, and a book of random numbers was used to select a sample from the list. Students sampled were generally representative of the actual proportions of students enrolled by class and major during spring 1980. The academic vice-president asked all deans and departmental chairpersons to distribute a parallel survey to each of the full- and part-time faculty in their respective areas. Of the 1,753 faculty surveyed, 443 (a 25.3 percent response rate) returned the survey. This response rate, while low, is not atypical for mail surveys. While faculty responses were distributed fairly evenly across all schools, the results probably contain a bias toward frequent library users because of the low response rate from part-time temporary faculty. An analysis of survey responses indicates that a substantial portion of part-time faculty (20 percent) never use the library, compared with only 2.2. percent of the full-time faculty. A much smaller number of temporary faculty, most of whom are also part-time, returned the survey versus tenured or tenure-track faculty. This bias toward the frequent library user is not present in the student results where it is possible to obtain an almost 100 percent response rate through class administration. Verification of the accuracy of questionnaire responses is difficult; however, the questionnaire was pretested in one graduate and two undergraduate library science classes so

that questions would be designed to avoid misinterpretation of instructions or questions leading to response errors. The data available from the student and faculty surveys were analyzed with the assistance of SPSS frequencies and crosstabs programs.

USER POPULATION CHARACTERISTICS

As is true in other academic libraries, the recent user survey at San Jose State University reveals relatively low general use of the library; 12.2 percent of the students never use the library, while only 29.6 percent use the library once a week or more during the semester. Use by faculty is also fairly low, 31.9 percent use the library once a week or more, and 5.2 percent never use the library. The majority of faculty (62.2 percent) rely on purchased books and periodicals as their primary source of information for teaching and research, while only 29.1 percent rely on the library as their primary source.

Surveys conducted in other libraries have found the percentage of part-time students who did not use academic libraries as high as 50 percent[19] and as low as 25 percent.[20] Pritchard and Payne also found that part-time students who attended classes during the day were more likely to use the library than evening students.[21]

As illustrated in table 1, students seldom or never using San Jose State University Library are more likely to be evening students, part-time, female, and white or black rather than other ethnic groups. Students using the library frequently are more likely to be enrolled full-time and from Asian or Chicano ethnic backgrounds. Results from the faculty survey, illustrated in table 2, reveal that faculty seldom or never using the library are more likely to be evening instructors, part-time, and temporary. Faculty using the library frequently are more likely to be full-time, tenure-track, and teach classes primarily during the day. While 34.7 percent of all full-time students seldom or never use San Jose State University Library, almost half (45.8 percent) of all part-time students seldom or never use the library. A New York University survey found that 57 percent of all students used the library at least once weekly;[22] only 29.6 percent of all San Jose students use the library weekly. At the time of the survey only 26 percent of the New York University student body was part-time,[23] while 40 percent of San Jose's students are part-time. The San Jose data support previous research findings on low library use by part-time students. The number of part-time students in a university appears to decrease the level of library use significantly.

Declining use levels may be slightly offset by the increase in non-white ethnic populations, particularly in areas having high concentrations of Asian students. One of the most interesting results of the San Jose study is the significantly higher frequency of library use by Asians and Chicanos compared to other ethnic groups (see table 1). A recent study on the information needs of Californians found that Asians were highest in their use of libraries as information sources,[24] and that Hispanics have the largest proportion who never use a library to seek information.[25] In the case of San Jose's Chicano students, other factors such as educational level must affect information-seeking patterns more than ethnic background.

As with other urban campuses, San Jose State students have convenient access to many other alternative resources. Other libraries are an important resource for San Jose State faculty and students; 57.5 percent of students and 70.2 percent of faculty reported that other libraries are used during the semester in connection with San Jose State course work for teaching, study, and research. There are no significant differences between part- and full-time or day and evening students. Faculty using other libraries are more likely to be full-time, male, and tenured or tenure-track, but differences between day and evening teachers, while significant, are very small. Although Gocek does not find geographic proximity to be the major determinant of use,[26] it is difficult to measure, and others have found that it does play a role. Extension and commuting students are more inclined to use libraries

TABLE 1

LIBRARY USER PATTERNS: STUDENT POPULATION CHARACTERISTICS ($N = 1,470$)

Frequency of Use of SJSU Library	Class Time			Class Load		Sex		Ethnic Background			
	Day & Eve.	Day	Eve.	Full-time	Part-time	Male	Female	Asian	Chicano	Black	White
Seldom or never use (less than once/month)	27.0%	38.2%	49.6%	34.7%	45.8%	30.6%	42.1%	21.9%	27.8%	38.7%	40.5%
Occasional use (once/2–4 wks.)	36.2	34.0	30.9	35.2	28.8	36.4	32.2	34.1	30.6	40.3	34.6
Frequent use (once/week or more)	36.7	27.7	19.6	30.2	25.4	33.1	25.8	43.9	41.6	21.0	25.0
	99.9	99.9	100.1	100.1	100.0	100.1	100.1	99.9	100.0	100.0	100.1
No answer	(6)	(6)	(6)	(4)	(4)	(22)	(22)	(24)	(24)	(24)	(24)
		$X^2 = 46.13$ $df = 15$ $p = .0001$		$X^2 = 27.98$ $df = 10$ $p = .001$		$X^2 = 36.00$ $df = 10$ $p = .0001$		$X^2 = 90.56$ $df = 30$ $p = .0001$			

TABLE 2

LIBRARY USER PATTERNS: FACULTY POPULATION CHARCTERISTICS ($N = 443$)

Frequency of Use of SJSU Library	Teaching Time		Teaching Load		Sex		Appointment		
	Day	Eve.	Full-time	Part-time	Male	Female	Tenured	Tenure-Track	Temporary
Seldom or never use (less than once/month)	21.7%	34.3%	19.8%	42.7%	21.5%	29.6%	15.6%	20.9%	45.4%
Occasional use (once/2–4 wks.)	43.8	46.1	46.8	33.3	44.5	44.3	50.0	34.9	33.3
Frequent use (once/week or more)	34.5	19.7	33.3	24.0	34.0	26.2	34.4	44.2	21.3
	100.0	100.1	99.9	100.0	100.0	100.1	100.0	100.0	100.0
No answer	(11)	(11)	(5)	(5)	(9)	(9)	(114)	(114)	(114)
	$X^2 = 181.37$ $df = 12$ $p = .0001$		$X^2 = 405.88$ $df = 12$ $p = .0001$		$X^2 = 171.73$ $df = 12$ $p = .0001$		$X^2 = 247.26$ $df = 18$ $p = .0001$		

close to their homes than dormitory or nearby campus residents.[27] Of San Diego State University Library nonusers who used other college libraries, 91.7 percent indicated that those libraries were closer to their homes.[28]

However, many frequent San Jose State students and faculty library users also used other libraries once a week or more (see figure 1). Only 10–20 percent of the students, but 40 percent of the faculty, who seldom use San Jose State University Library frequently use other libraries. Although few students and a substantial number of faculty who never use San Jose State University Library appear to use other libraries, frequent San Jose State Library users visit other libraries as a supplement to San Jose's resources.

LIBRARY USE BY ACADEMIC DISCIPLINE

Investigators have found that business and engineering undergraduates make relatively low use of the library.[29] Disciplines in the humanities and social sciences usually account for the bulk of library circulation.[30] The San Jose survey confirms results obtained from studies conducted at other academic libraries. Academic discipline is a significant variable in the level of general use of the San Jose State University Library. (See table 3.)

Business students and business, ap-

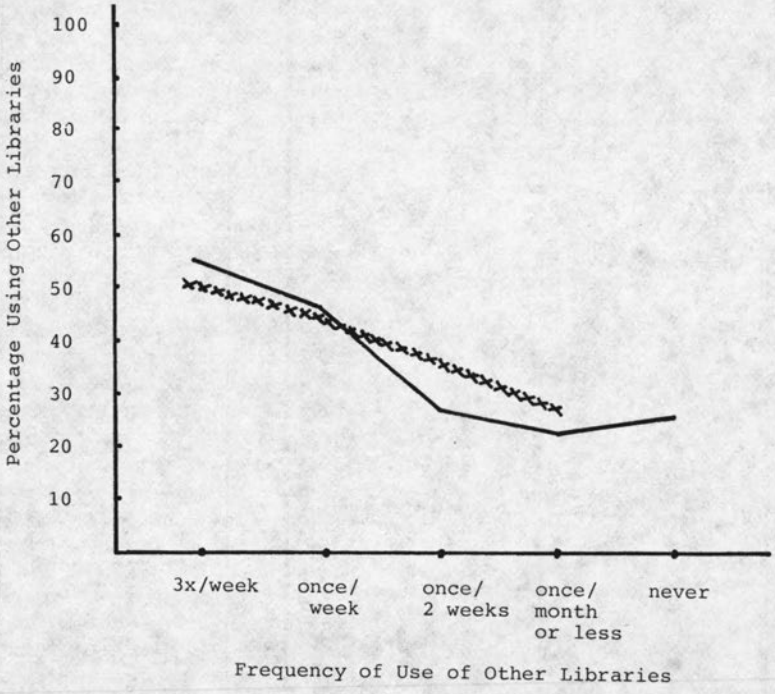


FIGURE 1
Use of Other Libraries by Frequent SJSU Library Users

TABLE 3
LIBRARY USE BY SCHOOL

Frequency of Use of SJSU Library	Humanities		Social Science		Science		Engineering		Education		Applied Arts		Business	
	S	F	S	F	S	F	S	F	S	F	S	F	S	F
Seldom or never use (less than once/month)	27.5%	17.6%	31.1%	12.0%	31.1%	20.2%	31.8%	37.2%	32.5%	27.5%	39.9%	32.8%	40.9%	45.8%
Occasional use (once/2–4 wks.)	35.0	51.4	36.2	37.4	37.8	49.5	30.6	39.5	37.5	52.5	37.5	42.9	36.9	33.3
Frequent use (once/week or more)	37.5	31.1	32.8	50.7	31.1	30.3	37.6	23.2	29.9	20.0	22.7	24.3	22.1	20.8
	100.0	100.1	100.1	100.1	100.0	100.0	100.0	99.9	99.9	100.0	100.1	100.0	99.9	99.9

Key: S = Students; F = Faculty.
For students: (N = 1470); no answer (115); χ^2 = 93.97 df = 55 p = .0008
For faculty: (N = 443); no answer (9); χ^2 = 315.11 df = 54 p = .0001

plied arts, and engineering faculty were least likely to use the library. Business, applied arts, and engineering faculty also had high proportions of temporary faculty (42.9 percent, 25.0 percent, 51.2 percent), while other schools averaged 15–17 percent. Since survey results indicated that temporary faculty are less likely to use the library (see table 2), the high proportions of temporary faculty in business, applied arts, and engineering further decrease the use of the library in these disciplines. Therefore, discipline is a more important variable than part-time status. This is somewhat difficult to determine because the numbers of temporary faculty underrepresented the faculty respondents. Temporary and part-time status do not have a uniform influence across schools. Despite the high proportion of temporary faculty in applied arts (42.9 percent) relative to business (25 percent), applied arts still has a much lower proportion of faculty who seldom or never use the library (see table 3). Also, a much higher proportion of part-time students seldom or never use the library (see tables 1 and 2). However, schools with the greatest proportion of part-time students (education, 31.2 percent, and social science, 17.2 percent) have much smaller proportions of students seldom or never using the library (32.5 percent and 31.1 percent as noted in table 3) than applied arts, where only 7.7 percent of students are part-time, but 39.9 percent seldom or never use the library. Social science faculty was the only group with more than half of its population using the library once a week or more.

Use of specific services within the library, such as current periodicals and reference, was also examined to determine how their use related to general use of the library. As noted earlier in table 3, general use of the library was usually lower in the professional schools. A much lower proportion of students and faculty in the professional schools tends to use the major types of information services presently offered by the library.

Faculty and students were also asked to rate the importance of San Jose State University Library as a source of information for studies (students) or research and

teaching (faculty). Respondents were asked to rank San Jose State University Library relative to a popular book or magazine, a colleague (for faculty), a professor (for students), or another library. Less than half of the engineering, science, business, and applied arts students ranked San Jose State University Library in their top two choices, as did a similar percentage of business, applied arts, education, and engineering faculty.

Some improvement in use of services could be made by strengthening book and periodical collections in the applied arts, since the highest proportion of students desiring more new books and periodical subscriptions are enrolled in applied arts. However, students and faculty in some professional schools do not appear to be greatly interested in strengthening the traditional library services. Engineering faculty and students have the lowest rate of interest in acquiring new books and periodicals.

Only 58.6 percent of San Jose students think that faculty in their major field are familiar with the library. The highest proportion of students stating that library resources are frequently required for study and research are majors in the schools of education, humanities, and social sciences (see table 4).

Thus, results at San Jose, as well as findings in other academic library studies, indicate that faculty and students in professional programs, such as business and engineering, tend to make less use of the library than students and faculty in the traditional liberal arts programs, particularly in social sciences and the humanities. Therefore, the national shift from liberal arts to professional fields in student majors is likely to result in less use of library resources and more graduates who have not regularly used libraries as part of their college education.

TABLE 4

STUDENTS AND FACULTY INDICATING THAT COURSES IN MAJOR AREA FREQUENTLY REQUIRED USE OF THE LIBRARY FOR STUDY AND RESEARCH

School	Students ($N=1470$)	Faculty ($N=443$)
Education	37.5%	35.0%
Humanities	30.8	33.8
Social science	29.3	30.7
Applied arts	26.2	41.4
Science	19.3	24.2
Business	15.6	29.2
Engineering	7.0	11.6
No answer	(125)	(11)
	$X^2=144.32$ $df=44$ $p=.0001$	$X^2=111.65$ $df=36$ $p=.0001$

Note: Students and faculty were asked how often assignments in courses involved using library resources other than materials on reserve. Possible choices were: frequently, sometimes, rarely, never.

CONCLUSIONS

We can expect use of academic library collections and resources to decline because of (1) the trend toward part-time students and (2) majors in disciplines that are generally correlated with low library use. Libraries are already having serious budget problems. Declining use could be devastating if the administration considers the library less essential to the university, and therefore a logical area to cut funds.

Librarians must assume a leadership role in developing student skills in library and information use as part of undergraduate instruction. A vigorous and aggressive bibliographic instruction program that reaches out to all students and faculty is an obvious answer to low library use and has been much discussed in the literature. Colleges and universities across the nation are reexamining the curriculum and resurrecting core requirements. The new national interest in general education can serve as a vehicle to increase use of the library if an active bibliographic instruction program is developed as an integral part of the general education program of the university. In reviewing general education requirements, weaknesses in student library skills and the increasing importance of these skills for many occupations as well as understanding current developments have been noted.[31] Objectives of the California State University System general education program include ". . . to find and critically examine information . . . and . . . an understanding and appreciation of principles, methodologies, value systems, and thought processes employed in human in-

quiries." San Jose has developed a library instruction program as part of the general education lower- and upper-division writing requirements. Since the lower-division unit was implemented prior to this survey, and the upper-division unit during fall 1981, the results of this survey can be used as baseline data for future evaluation of the bibliographic instruction program.

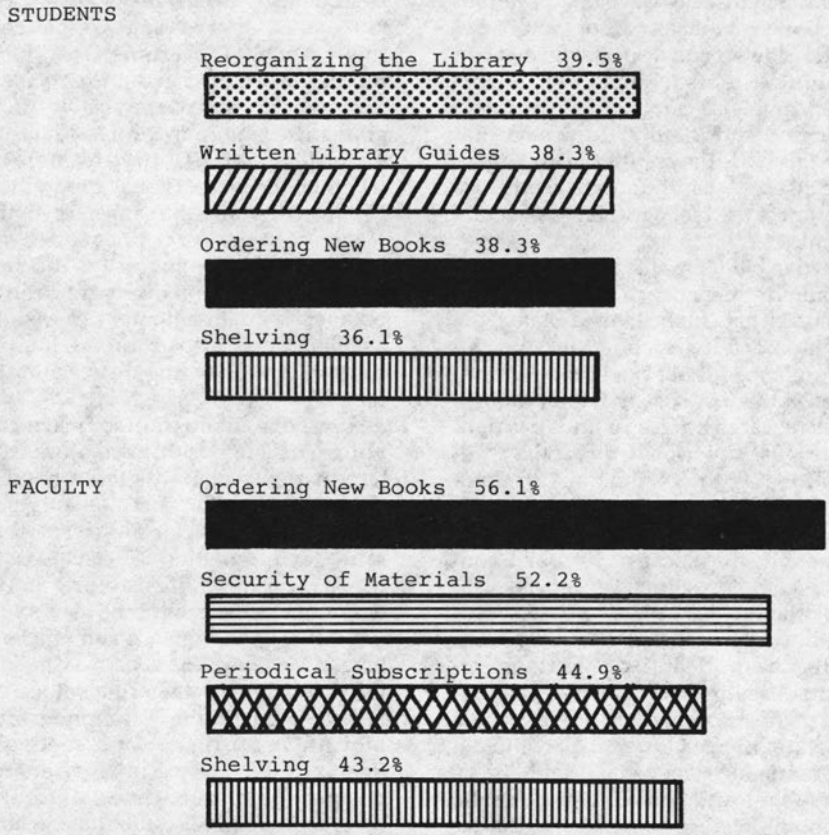
An active bibliographic instruction program may influence faculty attitudes toward library use. In the United States, the tradition in faculty teaching does not involve extensive use of the library nor encourage students to use the library to formulate research topics or independent inquiries. Faculty usually direct the readings or identify topics of inquiry in seminars. Studies have suggested that research findings are not a major source of information; that local or informal contacts are common sources of new ideas;[32] and that libraries are regarded as sources of further information once a research topic has been identified.[33] Further evidence that faculty do not normally require library use for courses is supported by a finding that there is little relationship between academic achievement and library use. One study did find that as a student's grade point average rose, so did the reported use of the library;[34] however, the data collected at San Jose do not confirm this thesis. Respondents were asked to list their grade point averages. Based upon self-reported grade point averages, library use appears to have little relationship to *A* (4.0), *B* (3.0), or *C* (2.0) grade point averages, although there is a significant difference between very poor academic students (below 2.0) and others.

This academic tradition in teaching will be very difficult to change. However, incorporating required library instruction into both lower- and upper-division general education writing requirements as San Jose has done, should have several positive effects. At the very least, the program will encourage faculty members to identify the library as a more frequent source of information on designated research topics. Future faculty, who discovered the use and value of library resources as students, will be more likely to incorporate use of library resources into courses they teach. Librarians and faculty, through working together, particularly in the upper-division general education programs for majors in professional fields, have the opportunity to determine whether the professional programs simply do not require the same level of library resources as the humanities and social sciences or whether low use is a symptom that the information needs are strong, but not met by existing library services. Thus, a bibliographic instruction program could contribute to changing the teaching tradition.

However, bibliographic instruction is not a sufficient solution. Research on information-seeking patterns has generally concluded that cost to the user is the most important factor in determining the source of information selected. Cost to the user has been identified as the value of the user's time—in terms of the user's perceptions of the convenience and efficiency of library services.[35] Studies have identified the lack of time as the principal reason for nonuse, particularly among the employed,[36] part-time,[37] and evening students.[38] A 1976 New York University survey reported that time, difficulty in obtaining materials, purchasing materials, and lack of need for library materials were the principal reasons for infrequent use.[39] When material is needed to obtain information, Californians are most likely to buy or subscribe to the material.[40] Nationwide survey results indicate that book readers purchased their own books or borrowed them from a friend more often than they borrowed them from a library.[41]

There is some evidence that larger libraries create greater difficulties in locating materials. Commuting students with limited time expressed preference for the public library despite limited collections.[42] In one area, smaller polytechnic libraries received higher use despite shorter evening hours.[43]

Results at San Jose confirm the general findings from other libraries that lack of need and cost to the user are the two principal reasons for low use. The greatest proportion of students reported no need



Other service improvements not listed among the top four choices of students or faculty were: extended hours, telephone renewal, automating circulation, personal security, staff help in bookstacks and at service desks, closed periodical stacks, and discarding outdated materials.

FIGURE 2
Service Improvements: Student and Faculty User Priorities

(38 percent), followed by poor organization of the library (26 percent), and greater convenience of another library (11 percent). Of the faculty who never or seldom use the library, the majority gave as the reason greater convenience of another library (38 percent), followed by no time (23 percent), no need (21 percent), and poor organization of the library (15 percent).

Library hours do not appear to be a primary reason for low use. The San Jose study confirms the results of the New York University survey finding that frequent users were most dissatisfied with library hours.[44] At San Jose, 43.6 percent of students who used the library three times a week or more believed that the library hours were not always adequate. A much higher proportion of evening students (48 percent) indicated that library hours were not always adequate than did day students (26.7 percent). But a slightly smaller percentage of evening students (22 percent) rated extended hours as a very important service improvement than did daytime students (25.5 percent). An increase in the main library hours, now seventy-seven hours per week during the semester (excluding reserve), appears more likely to increase use by already frequent users rather than attracting the nonuser.

Because survey results indicate that the greater convenience of another library in a large urban area determines use, it is particularly desirable to strengthen direct reciprocal borrowing and access programs between institutional libraries. Such programs should then be supplemented by further identification of special collections in the area and planned regional cooperative collection development programs between public, special, and academic libraries.

In the San Jose survey, students and faculty were asked to rate certain possible improvements in library services as "very important," "important," "not important," or "no opinion." Given the existing knowledge about the nature of information-seeking patterns, it can be presumed that students and faculty would rate most highly those service improvements perceived to reduce the cost (i.e., effort) to themselves as users. Continuing nationwide declines in budgetary support to libraries, as well as other educational and public service institutions, will make offering service improvements difficult. Therefore, it is discouraging to note the difference in student and faculty user priorities (see figure 2). The top four choices of the faculty tend to focus on the acquisition, preservation, and maintenance of the book and periodical collections, whereas students give equal priority to improved orientation and organization and the ordering of new books. Both faculty and students do rate improvements in reshelving of materials and acquisition of new books as top choices. In summary, besides a strong library instruction program, academic libraries need to identify top user priorities and focus on improving these services. The San Jose State University Library might best encourage use through reducing costs to both faculty and student users by attempting to improve the current acquisition and reshelving rates for library materials. Since book budgets are declining, it will be important to consider historical and future trends in use of library materials when selecting current acquisitions.

Despite current developments in library automation, library research is still a time-consuming, labor-intensive effort for the individual user. User surveys that establish user priorities for service improvements and common priorities of different user groups can be an effective tool. Technology has contributed to reducing user effort in such areas as online literature searching and automated circulation systems. However, the new technology is often available in such areas as online searching only for a fee. Databases in disciplines that make extensive use of the library, humanities and history, are still largely undeveloped because of limited business, defense, or government funds for investment in these areas. Investment in top-priority user service improvements should make the use of the library less costly for most users, thus enabling the library to be a major information resource, if not the "heart of the university," for an increased number of students and faculty.

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Selected Journals in Library and Information Science

Beverly P. Lynch

This article begins a series of reviews of journals published in the field of library and information science. Although it appears under a by-line, the reviews are a project of the librarians of the University of Illinois at Chicago. Each review is signed with the initials of the librarian who prepared it.[1]

In a recent review of the journal literature of the field,[2] Richard Johnson identifies 500–1,000 periodicals, newsletters, and other publications in librarianship. The 1981 edition of *Ulrich's International Periodicals Directory* lists about 950 titles under the heading "Library and Information Services."

Older journals may be reviewed from time to time in this series in order to compare them with newer ones, or to review them again because of changes in content or style.

Access: Microcomputers in Libraries. Westfir, Oreg.: DAC Publications. V.1, no.1 (July 1981), quarterly, $11 per year. ISSN: 0277-9784.

The use of microcomputers in libraries is a matter of great interest to many librarians; this new publication will provide them with a useful source of information. Obviously intended for those with little computer experience, articles are short, non-technical, and non-intimidating. The first issue discusses dial-up databases and the principles underlying database management systems, publishes a field report on a microcomputer support online catalog, interviews the creator of Lewis and Clark College's CLAS acquisitions system, and gives brief descriptions of new software and hardware products. A bargain for any library interested in microcomputer applications or increasing staff computer literacy.—*LAS.*

Cataloging & Classification Quarterly. New York: Haworth Press. V.1, no.1 (Fall 1980), quarterly, $35 (individuals), $45 (institutions) per volume. ISSN: 0163-9374.

The "Editorial" in the first issue of *Cataloging & Classification Quarterly* begins, "The appearance of any new journal in the field of librarianship requires justification." And so it does. The full contents of the first five issues of this publication and the continued appearance of articles on cataloging and classification elsewhere indicate that there is no shortage of articles. The number of articles on cataloging in most of the ALA journal publications and in almost every other library publication supports *CCQ*'s contention that it is filling a gap of library scholarly publishing in an area with high interest.

A look at the first few issues reveals that the articles contained here are in many cases theoretical. Nonetheless, an effort has been made to include some "how we do it good" articles and some articles that address topics related to cataloging (e.g., usefulness of archive tapes, indexes). Volume 2, numbers 1-2 (1982) contains the proceedings of the International Symposium on the Future of the Union Cata-

1. Nancy R. John, William G. Jones, Louis A. Schultheiss.
2. Richard D. Johnson, "The Journal Literature of Librarianship," in *Advances in Librarianship,* V.12 (New York: Academic Press, 1982), p.127–50.

logue (University of Toronto, May 21–22, 1981). While, as is to be expected, the quality of these papers varies, this special issue makes available some materials that might be difficult to find on this important topic. It is available from Haworth as a monograph for $19.95. It is difficult to tell yet whether issues will often follow themes; two do and three do not. As with all Haworth publications, this quarterly seems to have some difficulty meeting its publication schedule.

Except for volume 2, numbers 1-2, each issue contains book reviews. The most recent issue—volume 2, numbers 3-4 (1982)—contained twelve reviews in the space of more than thirty pages. The reviews are thorough and the choice of materials excellent, if not entirely current. The opening reviews (Michael Gorman's review of Michael Carpenter's *Corporate Authorship* and Carpenter's review of Gorman's *Concise AACR2*) demonstrate the quality of the reviewers and the kinds of materials reviewed. They also show the editor's interest in making the journal a forum for the arguing of cataloging philosophies. If the journal can sustain this standard, the book review section could outshadow the articles for some readers.

The final section, "The Cataloger's Bookshelf," contains a checklist of recently published items of interest to catalogers. In the last issue, "recently" meant between 1980 and 1982, although two 1979 imprints were included. The headline of the section indicates that selected titles will be reviewed in forthcoming issues.

A section, "News," appeared in the first issues and has either been dropped, or there has been no news to print. Until a more regular schedule is achieved, there seems little likelihood of "timely" news. The change in size between volumes one and two may also dismay library bindery units.

CCQ has fared better than many Haworth journals; if the initial irregularities are ironed out, *CCQ* can have an important place in professional reading.—*NRJ.*

Information Services & Use. Amsterdam: North-Holland. V.1, no.1 (March 1981), bimonthly, Dfl 158 (approx. $73.50). ISSN: 0167-5265.

This journal describes itself as an "information and technology oriented publication with a wide scope of subject matter," including on- and off-line systems, library automation, word processing, and telecommunications. It is directed to an international audience of "librarians, information managers, designers and users of library and information systems." The issue used as the basis of this review, volume 1, number 2, contained five articles, three of which were papers previously read at conferences. The titles of these articles were "The Present Situation Regarding Vocal Data Acquisition" (M. J. Underwood); "The Socio-Economic Consequences and Limits of the Information Revolution" (L. J. Rankine); "Cultural and Political Traditions and Their Impact on the Transfer and Use of Scientific Information" (V. Rosenberg); "Use of the BIOSIS Computerized Data Base Taught with Audiovisual Technology" (P. M. Vaillancourt); and "International Marketing Aspects for Information Services" (A. W. Elias, a member of the three-person editorial board). This issue's "Q & A" column responded to the question "How do I start automating our office?" There was a section of "News, Trends, and Comments," a short conference report on the October 1981 National Reprographic Centre conference on word processors in the library, and a short book review of the *Penguin Dictionary of Microprocessors.* The choice of topics covers such a wide range that the reader may wonder whether there is an audience for such a journal, or whether one type of article will eventually predominate. In addition, issue number 2 was only fifty pages, so that the potential subscriber might well want to see whether the content expands before making an investment in a subscription. At this time (December 1982) no further issues have appeared.—*WGJ.*

Library Computer Equipment Review. Westport, Conn.: Microform Review, Inc. V.1, no.1 (Jan.-June 1979), semiannual. Price varies between $85–$150 per year,

depending on library classification. ISSN: 0191-1295.

From the librarian's standpoint, the greatest virtues of this new publication are that it presents its material from the librarian's viewpoint, and that it does so clearly, with a minimum of jargon. Each issue is organized around a single topic, such as small business computers or turnkey circulation systems, with a state-of-the-art report followed by reviews of six to eight products pertaining to the theme of the issue. Reports and individual reviews are illustrated, mostly with photographs. One potential problem is that *everything* in the two issues viewed—editorials, reports, and equipment reviews—appears to be the work of one individual. While this individual (William Saffady, of the Graduate School of Library and Information Science, Pratt Institute), is generally very well informed, this fact makes for excessive uniformity of opinion at a time when some diversity might be more useful to the reader.

The *Review* is expensive—$42.50 to $75.00 per issue—depending on the size of the acquisitions budget. It will not be of much interest to nonlibrarians. Therefore, its cost will be hard to justify unless the library supports extensive library science collections or has a working commitment to library automation.—*LAS.*

Medical Reference Services Quarterly. New York: Haworth. V.1, no.1 (Spring 1982), quarterly, $25 (individuals), $40 (libraries, subscription agencies, other institutions). ISSN: 0276-3869.

Issue number 1 describes this new journal as a practice-oriented journal, dealing with "topics of current interest and practical value." One of the justifications for establishing this new journal is the "sense of urgency felt in medical reference work," and the need to provide extensive bibliographic services to the members of a demanding profession. Online searching will be a focus of the journal. This first issue contained four topical articles (including one bibliography on the dying patient); a column of opinion and exchange; an online update column for search analysts; and a user education column publicizing "practical information on user education topics." It will include a "variety of user education material, including articles, editorial comment, notices of available programs and descriptions of successful projects." The first issue contained six book reviews ranging in length from one to three pages. Research-oriented articles are included only if they contain practical applications, analyzed and clearly presented, for the practicing medical librarian.

The significant question is whether there is a need for a new journal devoted specifically to medical reference services, there already being journals devoted to reference, to online search services, and to bibliographic instruction, all topics addressed by this title. It will be convenient for medical librarians to have these issues addressed in one title, but in spite of the overlap in coverage, it is not likely that their need to consult the existing topical titles will be obviated.—*WGJ.*

The Reference Librarian. New York: Haworth. Nos.1/2 (Fall/Winter 1981), 4 issues/$40. ISSN: 0276-3877.

The Reference Librarian, edited by Bill Katz, examines a single topic in each number; its editors "seek authors who have a unique, imaginative and practical point of view about the topic under discussion. Librarians from all types and sizes of libraries will be asked to contribute, as will students and teachers and some laypersons." As with some other Haworth Press publications, each issue will be marketed as a monograph because of its devotion to a single topic. For example, the first combined issue (Nos.1/2) on "Reference Services in the 1980s" contains nineteen articles in 128 pages; the third issue (Spring 1982) on "Reference Services Administration & Management" contains sixteen articles in 125 pages and sells for $24. Issue 1/2 also contains a column entitled "In My Judgment," consisting of seventy-nine responses to a letter asking selected librarians "What does it mean to be a reference librarian and what is it going to mean in the years ahead?" The character of both

the contributed articles and the short responses included in the column is observational, containing prescriptions for action, and written from practical experience. Of course, many of these observations are sound and even provocative, but they are only situationally valid. A journal entirely devoted to such contributions may be limited in its effectiveness. In addition, only the most dedicated reader is likely to read through all the contributions. The contributors are, however, well known for their achievements and knowledgeability, and the librarian who purchases only those issues dealing with topics of personal interest is spending resources most wisely.—*WGJ.*

RSR: Reference Services Review. Ann Arbor, Mich.: Pierian Press. V.1, no.1 (Jan./Mar. 1973), quarterly, $39.50. ISSN:0090-7324.

The appointment of Nancy Jean Melin as the new editor of *RSR* in July 1981 was accompanied by a press release which announced that the "quarterly review is once again on a regular and timely publication schedule." At that time it added several new columns: "Indexes and Indexers," describing "the latest developments in manual and online indexing tools," and "Reference Data Bases," featuring "reviews of particular data-bases and comparative studies of their costs and value," as well as older columns, "Landmarks of Reference," "Comparative Reviews," "Government Publications," and "Reference Serials." By fall 1982 there were eleven separate columns on the topics of bibliographic instruction, comparative reviews, core collections, current surveys, government publications, indexers and indexes, landmarks of reference, reference databases, reference management, reference resources, and reference serials, each with its own editor. Issues are approximately 110 pages in length and contain the contributions of between twenty and thirty librarians and subject specialists. *RSR* does now appear on a much more regular schedule and has clearly expanded the number of its recurring columns, evidently flourishing under the direction of its new editor.—*WGJ.*

Resource Sharing & Library Networks. New York: Haworth Press. V.1, no.1 (Fall 1981), quarterly, $35 per volume. ISSN: 0270-3173.

Two issues of *Resource Sharing & Library Networks,* volume 1, number 1 and volume 1, numbers 2-3, have appeared. A third issue, volume 1, number 4, has not yet been published. According to Haworth Press, the second volume will be called *Network Librarian,* and Glyn T. Evans, director, SUNY-OCLC, will be the new editor.—*NRJ.*

Science & Technology Libraries. New York: Haworth. V.1, no.1 (Fall 1980), quarterly, $42, plus postage and handling. ISSN: 0194-262X.

Editor Ellis Mount states that this journal was established because there has not previously been any journal entirely devoted to science and technology libraries, regardless of their type of sponsorship and of the fields of science or technology with which they were involved. Each issue of this new journal is to be focused on a single theme of interest to sci-tech librarians. In addition to the topical articles, each issue is to include three special sections: (1) "Sci-Tech Online," "a compilation of information on sci-tech databases and their online utilization"; (2) "New Reference Works in Science and Technology"; and (3) "Sci-Tech Notes," "short communications from any sci-tech librarian wishing to contribute a brief account of some new project or activity of interest to his/her colleagues." Because of the topical focus of each issue, individual issues are being marketed and sold as monographs. In spite of the editor's intent to concentrate on sci-tech libraries, the first issue with its theme of "Planning for Online Search Service in Sci-Tech Libraries," contained two articles on online searching in public libraries. Volume 2, number 2 (Winter 1981) contains a fourteen-page article by Tony Stankus on "Journals for Anatomists in Medical versus Nonmedical Biological Research Institutes," an article appropriate for the journal but outside the stated scope of the issue, "Role of Patents in Sci-Tech Libraries." The inclusion of papers outside the scope of the journal

or the issue may serve neither author nor reader very well.

Volume 1, number 1 contains ten articles in 132 pages (excluding columns); volume 2, number 2 contains five articles in 85 pages and sells as a monograph for $25. In addition, the format has shrunk from 7-by-10-inch to 5½-by-8-inch, and the role that "Sci-Tech Notes" was to play has not materialized. Nonetheless, this journal appears to be alive and well, having now reached publication of volume 3, number 1. Because of the publisher's intent to market this title both as a journal and its issues as monographs, greater attention should be paid matters of scope, content, format, and length in order that all consumers will receive what they intended to buy.—*WGJ.*

Videodisk/Teletext. Westport, Conn.: Microform Review, Inc. V.1, no.1 (Winter 1981), quarterly, $52 per volume year. ISSN: 0198-9456.

This new publication is intended for media technologists, educators, and librarians seriously interested in the uses and capabilities of videodisks and teletext. Although articles on these subjects are published in other professional journals, this is obviously an attempt to bring together material of interest to several related professions. There are well-illustrated general articles, case studies, substantial bibliographies of both general and technical articles, and news of new products and developments.

This title is a worthwhile addition to libraries with an active interest in media technology or computer-assisted instruction.—*LAS.*

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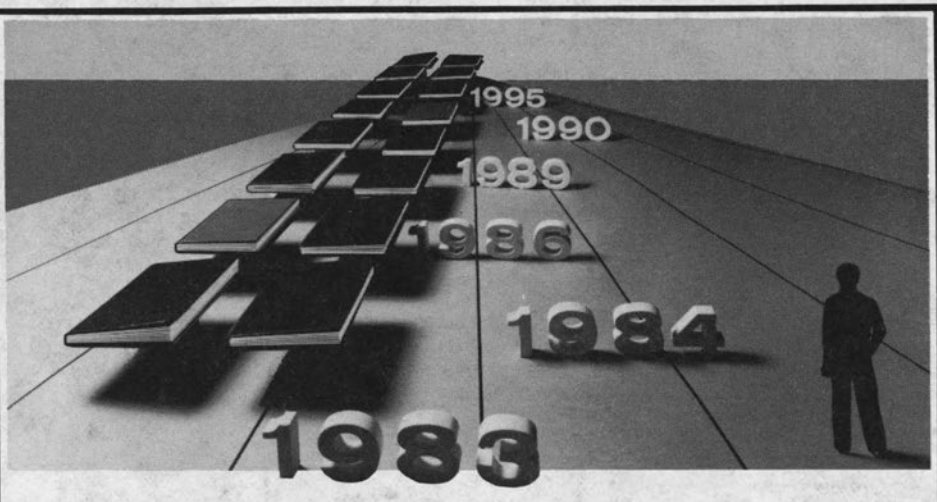

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Research Notes

End-User Training in the Use of a Small Swedish Database

Nancy Fjällbrant, Elisabeth Kihlén, and Margareta Malmgren

INTRODUCTION

In recent years there has been a considerable increase in the availability of computer-stored information both in bibliographic and nonbibliographic databases.[1,2] This increase in online information has resulted in a need to teach people how to use the available facilities. As Lancaster pointed out in 1973,

> a critical factor affecting the success or failure of an on-line information retrieval system is the effectiveness of the procedures employed to teach people how to use the facilities.[3]

Several groups are concerned with online orientation, training, and education: (1) database producers; (2) systems operators; (3) institutions responsible for terminal operation for example libraries or information centres within academic institutions; (4) library schools; (5) intermediaries; (6) end-users.

This paper will describe how a group of end-users (engineering undergraduates) were taught to carry out interactive online searching on a small, specialized Scandinavian database. Their search techniques and attitude to online searching will be examined and evaluated.

THE BYGGDOK DATABASE

The BYGGDOK database has been developed and built up by the Swedish National Building Documentation Centre.[4] BYGGDOK is a bibliographic database containing some 25,000 references (with an annual growth rate of 5,000). The database covers the highly specialized field of building and construction with references dealing with the following subjects: architecture, building materials, building planning, civil engineering, construction technology, environmental technology, installation technology, and urban planning.

Input to the database is mainly Scandinavian material, in the form of journal articles, reports, product information standards, etc. The abstracts are written in the language of the country of origin (mainly Swedish, Danish, or Norwegian). Each reference is described with Swedish keywords. The database can, however, be used by persons with no knowledge of Swedish, by means of a reduced UDC (universal decimal classification) code system developed by the Swedish National Building Documentation Centre.

BYGGDOK is available to users throughout Scandinavia via SCANNET, the Nordic data network. The database is widely used by practising engineers and architects. The concentration on Scandi-

Nancy Fjällbrant is deputy librarian; Elisabeth Kihlén is library assistant; and Margareta Malmgren is research assistant, all of Chalmers University of Technology, Gothenburg, Sweden.

navian material is regarded as being very practical, due to the differences in building standards between Scandinavian and other countries.

LIBRARY USER EDUCATION PROGRAMME AT CHALMERS UNIVERSITY

Chalmers University Library developed, from 1974 to 1980, an extensive user education programme[5] that can be divided into the following stages:

1. Orientation for new users.
2. A fourteen-hour introduction to information retrieval for third- and fourth-year engineering undergraduates.
3. Advanced courses in information retrieval (including computerized methods) for doctoral students—a seventy-hour course.
4. Courses for practising engineers, laboratory assistants, etc.

In 1980, Chalmers Library received a grant from the Office of the Chancellor of Swedish Universities to investigate the possibility of teaching end-users how to carry out direct online searches on BYGGDOK. More than 300 undergraduates from the schools of civil and mechanical engineering have so far taken part in practical online training. The BYGGDOK online training programme will be described in the following sections.

GOALS AND OBJECTIVES FOR THE BYGGDOK ONLINE INSTRUCTION

The main goal for the undergraduate online programme was to enable the student to carry out online information searches within a subject field on the BYGGDOK database as, and when, required in connection with information needs.

Specific objectives were described as follows—after completing the course the end-user should:

1. Be aware of different methods for information retrieval: manual, batch processing, SDI, and interactive online.
2. Be aware of different kinds of information searches: current awareness, retrospective, factual.
3. Be able to carry out logging-on procedures for a network database.
4. Be able to use a teletype or VDU (visual display unit) terminal.
5. Be able to use the basic commands and features of the BYGGDOK retrieval system.
6. Be familiar with a typical unit record.
7. Be able to express a search topic in suitable terms and parameters.
8. Be able to develop a search strategy in terms of Boolean logic.
9. Be able to evaluate the results obtained.

TEACHING METHODS CHOSEN AND ORGANIZATION OF COURSE

There is a wide variety of methods and media available for online teaching. A selection of methods was used—lectures, small group seminars and demonstrations, audiovisual demonstrations, printed manuals and checklists, and direct "hands-on" training. The introductory course lecture was used to present a frame of reference, with emphasis on the patterns of communication and the relationship between computerized information retrieval and manual methods. Different types of information searches were presented. The main part of the course was based on small group methods—laboratory sessions with demonstrations and practical searches on a topic of the student's own choice.

The first laboratory session (five hours) was mainly devoted to manual information searching, using a variety of tools. The last hour was used for an orientation on computerized information retrieval using audiovisual, multimedia MEDIATRON programmes. The MEDIATRON teaching aid was developed at the Central Information Service of the University of London by Vickery and Pratt.[6] The MEDIATRON is a modified stereotape recorder that is designed to carry out simultaneous recordings of audio commentaries, trigger pulses for photographic slides, and digital signals from computerized information retrieval systems. A multimedia online-orientation programme was produced using synchronized slides, audio commentaries, and recorded digital signals (examples of a search). This online orientation was displayed via slide projector, loudspeaker, VDU, and monitors.

The BYGGDOK database was described and demonstrated. Students were then given a short manual that introduced computerized information retrieval, described the BYGGDOK database, logging-on techniques, the search command language, and search techniques. They were told that at the next session, in a week's time, they would carry out their own hands-on search.

The second laboratory session started with a short review, including a MEDIATRON demonstration programme of BYGGDOK. Students then prepared their searches, planning strategies with the aid of search-term frequency lists. They usually worked in groups of two or three persons. The group then carried out their search on a teletype terminal, with a BYGGDOK checklist of commands immediately adjacent to the terminal.

On completion of the course the students handed in a list of references relevant to their search topic, found by means of both manual and online searching. They also presented copies of their online search in which the references obtained were assessed for relevance and novelty.

EVALUATION

Evaluation of the online learning was carried out in a number of ways:

1. Students were asked to complete a questionnaire about:
- overall gain from the course
- the teaching material used
- the practical terminal sessions
- future use of the BYGGDOK database and of online searching
- the teaching methods used

2. Direct observation of how the end-users managed to log on and off and carry out a search.

3. Comparative search analysis with regard to:
- the process (search effort)
- the product (in terms of recall and precision)

A number of end-user searches were repeated by a trained BYGGDOK intermediary. Searchers' efforts were compared with respect to:
- Numbers of commands used
- Different types of commands used
- Numbers of search descriptors
- Sets viewed (any set which was requested for display or printing)
- Search modification
- Errors made
- Connect time

The choice of these parameters was based on measures for discrimination among users with different levels and experience of online searching described by Fenichel in 1979.[7] The searches were also compared with respect to recall and precision.

QUESTIONNAIRE RESPONSES

Students were asked to state their opinions as to "overall gain" from the course, on the new teaching material produced, and were asked to evaluate the practical terminal sessions (see tables 1–3).

In addition, students were asked to state their attitudes to this kind of training in computerized information retrieval (see table 4). For comparison, a group which had merely received online orientation is included.

Students were asked if they thought they would use the BYGGDOK database at some future time. Fifty-five percent thought they would use the database, 3 percent thought it too expensive, and 42 percent were not sure. Eighty-four percent stated that, if they had access to a terminal, they would like to carry out their own online searching in the future, whereas 17 percent were not sure about this. Eighty percent of the students said that they preferred computerized information retrieval to manual methods. Reasons given were speed, convenience, and flexibility. A number of students pointed out that it was possible to combine more search terms in computerized searching

TABLE 1
"OVERALL GAIN" FROM COURSES IN INFORMATION RETRIEVAL

"Overall Gain"	Online Course 1980 %	Manual Course 1975 %
Very good	17	15
Good	67	58
Satisfactory	16	24
Little	0	3
Nothing	0	0
	(N = 70)	(N = 220)

TABLE 2
OPINIONS ABOUT TEACHING MATERIAL AND MEDIA

	BYGGDOK Manual	MEDIATRON Demonstration	Checklist
Very good	14	9	19
Good	73	47	61
Satisfactory	12	36	20
Hardly satisfactory	0	8	0
Unsatisfactory	0	0	0

TABLE 3
PRACTICAL TERMINAL SESSIONS

Attitudes to		Difficulty	
Very good	23%	Very easy	23%
Good	70%	Easy	63%
Satisfactory	6%	'About right'	14%

TABLE 4
DO YOU THINK THIS IS A GOOD WAY FOR TEACHING ABOUT ONLINE INFORMATION RETRIEVAL?

	1980 (Includes Practical Searching)	1978 Orientation Only
Very good way	61%	10%
Good way	38%	66%
No opinion	1%	9%
Not particularly good	0%	7%
Not a good way	0%	0%

than by use of the manual tools. One particularly interesting fact that emerged from the evaluation was that students were themselves evaluating the different approaches. This can be illustrated by the following comments:

"Both manual and computerized searching are useful. Online techniques are convenient and quick: manual searching allows a rapid glance through subject headings in an index. You need to combine both methods."

"You can't say that you prefer manual or computer searching. They have different advantages and disadvantages. The computer's strength is in its speed, and the fact that the references are printed out. In manual searching it is easy to limit a search by suitable choice of search term."

"The database contained only a limited amount of information—we found more foreign language references by manual methods."

"Both methods are necessary."

"I found more references through manual searching. It is important to know how to perform manual searches, as many libraries don't yet have terminals for computer searching. Computer methods were interesting and I enjoyed the searching."

Observations

All the students (some 300) who have so far taken part in online training sessions, have managed to carry out the various logging-on procedures and terminal searching. In the first sessions the main difficulty was finding the *On/Off* switch on the terminals. (This was easily remedied by writing *On* and *Off* marks in large red letters on the appropriate parts of the machine!) Most of the students worked in small groups, and this appeared more satisfactory than individual terminal work. In cases of difficulty the group could often work out a joint solution, whereas individual searchers tended to ask the assistant in charge of the session for advice.

There was no doubt that the students enjoyed the terminal sessions. Often it was difficult to stop students searching! This sometimes led to grumbles amongst those waiting. We increased the number of terminals from two to four in order to

limit waiting time. A considerable number of students have come back to the library and asked to carry out an online search in connection with some other project.

Comparative Search Analysis

Eleven end-user searches were compared with similar searches carried out by a trained BYGGDOK intermediary. The latter not only had extensive experience in searching, but also in input and construction of BYGGDOK. She was conversant with the use of search techniques based on the special reduced UDC code developed at the Swedish Institute of Building Documentation for this purpose. It should be noted that the students had not been taught the use of the classification code for their online searching. At the same time, the control searches were carried out in the absence of an end-user, so that the interactive relevance judgement of the user was missing. The intermediary said that, as a non-engineer, she experienced some difficulty in relevance judgements. The student group was highly motivated, as they were searching for information needed for their research projects. With respect to external conditions, variables such as type of terminal, search tools, database, and search command language were controlled and identical. System response varied to a small extent from search to search. Comparisons of search efforts between end-users and intermediary are shown in table 5.

From this table it can be seen that end-users expended greater efforts on searching than did the intermediaries. The latter carried out short, economical searches. The end-users showed considerable determination and flexibility in their attempts to obtain relevant references from the BYGGDOK database, with repeated restarts and the use of a variety of descriptors. Their inexperience can be seen in the errors (four per search) and in the dominance of use of non-truncated descriptors with respect to truncated terms. The experienced intermediary made greater use of truncated descriptors. Connect time was greater for end-users than for the experienced intermediary.

Results of end-user and intermediary searches were compared with regard to recall and precision. These are defined as follows:

$$\text{Recall} = \frac{\text{No. of relevant references retrieved}}{\text{Total no. of relevant references in the database}}$$

$$\text{Precision} = \frac{\text{Relevant references retrieved}}{\text{Total no. of references retrieved}}$$

The search results are seen in table 6.

Recall is surprisingly high for the end-user group. This may be connected with their search motivation and aforementioned determination to obtain references. Precision was considerably lower for the end-user group than for the intermediary.

TABLE 5
COMPARISON OF SEARCH EFFORT—BYGGDOK SEARCHES

Search Effort Variable	End-Users*	Intermediary*
Total no. of commands used	26	8
Different types of commands	8	5
Total number of descriptors searched	11	4
Number of truncated descriptors searched	4	1
Number of non-truncated descriptors searched	7	2
Unique descriptors	8	4
Sets viewed	3	1
Errors/search	3	0
Connect time	<	>

*Average/search

TABLE 6
COMPARISON OF SEARCH RESULTS

Search Product Variables	End-Users	Intermediary
Recall	62%	80%
Precision	46%	76%

This factor is perhaps of less importance in the use of a small database than with a larger one.

DISCUSSION AND CONCLUSION

Most of the teaching/learning activities on computerized IR for nongraduates has been directed towards orientation and promotion—by means of demonstration searches and lectures. There is, however, evidence to show that new users can learn to perform searches after a short period of training. Engineering and science undergraduates are, today, in many cases, competent in the use of terminals for online computations and simulations. It seemed, therefore, reasonable to test the hypothesis that end-users could be trained to carry out their own interactive online searches using one system (and command language) and a limited number of databases.

This paper describes how a group of seventy civil engineering undergraduates were trained to use a small Swedish database—BYGGDOK—for online searching. The students achieved surprisingly good recall values, in comparison with an experienced intermediary. The students expressed very positive attitudes towards online information retrieval—84 percent said that if they had access to a terminal, they would like to carry out their own online searching in the future. The online training appears to have increased awareness of methods of information retrieval—not only computerized but also manual methods. ("You can't say that you prefer manual or computer searching. They have different advantages and disadvantages . . .")

The positive experience from this experiment led to the introduction of hands-on online training for a group of 200 mechanical engineering undergraduates, in 1981, on MechEn—a database produced at the Royal Institute of Technology, Stockholm. Two further groups of civil engineering undergraduates, and a smaller group of postgraduates, have received training in the use of BYGGDOK.

It is hoped to extend this type of training for students of architecture and engineering chemistry, so that online searching becomes a regular part of courses in information retrieval. Search results obtained by end-users will be compared with those obtained by intermediaries. It is hoped that these analyses will provide useful information about possible differences in search behaviour between new users and experienced intermediaries. This type of information can then be used to modify and improve existing teaching programmes. One example of this formative evaluation can be seen in the relative prevalence of nontruncated descriptors in the searches of the civil engineering students. In future training, more emphasis will be placed on the use of truncation to simplify search techniques.

It is important to study whether end-users can be taught to carry out online searching themselves, or whether all searches are best performed by an intermediary. It is often argued that intermediary performed searches are more cost-effective than those of end-users. Cost-effectiveness is sometimes expressed in terms of *unit cost* where:

$$\text{Unit cost} = \frac{\text{Connect time}}{\text{No. of relevant references retrieved}}$$

This measure of cost-effectiveness is, however, limited. In the world of the practising engineer or scientist, time is precious, and a truer measure of cost-effectiveness would be:

$$\text{Cost-effectiveness} = \frac{\text{Time used by engineer}}{\text{No. of relevant references}}$$

In the intermediary-performed search, this increases with distance from online search centre. We conclude that it is possible to train undergraduate engineering students (who will soon be practising engineers) to carry out searches based on one information system (and common command language) for a limited number of databases. With user-friendly interfaces, it seems reasonable to suppose that end-users will be increasingly able to carry out their own information searches in the future. The role of the intermediary, in turn, might well develop from that of individual searcher to that of adviser and con-

sultant, with specialized knowledge for transdisciplinary or exhaustive searches.

If you give a man a fish
He will have one meal
If you teach him to fish
He will be fed for life

—Old Chinese Proverb

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Deployment of Professional Librarians: A Barrier to the Availability of Publications in a Developing Country

Georgiana K. N. Nwagha

INTRODUCTION

The primary aim of librarians and information scientists is to serve users by providing them with access to recorded information. To accomplish this aim there are two requirements: the first is to help users recognize which records may be of interest and, secondly, to make it possible for the user to have access to these records.

It is obvious, therefore, that universal bibliographic control (UBC), whose primary aim is to aid users in the discovery of what records of interest exist, is not enough in itself. In fact, it has been argued that it is no use providing an ever fuller and faster supply of references if the documents to which they referred cannot be obtained.[1] To satisfy users, publications themselves must also be accessible to anyone. It has thus been realised, both by international bodies, such as IFLA and UNESCO, and by individual countries, that to derive the full benefit of the efforts towards UBC, there must be a programme of universal availability of publications (UAP).[2]

The present exponential growth of publications and the ever-increasing cost of printed materials mean that not even libraries in the most highly developed countries can hope to satisfy all the information needs of its users. As a result, resource sharing among libraries is increasingly being accepted as the only realistic means of maximizing the availability of materials and services needed for scholarly research. Unfortunately, in the developing countries, where the inadequacy of individual libraries is felt more acutely, certain barriers decrease the availability of publications, and resource sharing among libraries cannot be relied upon to maximize the availability of documents. Several of these barriers have been identified in the literature[3,4] and need not be elaborated here. They include shortage of funds, insufficient and unsatisfactory photocopying machinery, poor postal systems, shortage of foreign exchange, and inadequate union lists. However, there is one factor that has hitherto not been clearly identified, nor even realised as a barrier to the availability of publications in some developing countries. This is the deployment of professional librarians in libraries, which is quite distinct from the lack of a sufficient number of trained librarians. Deployment means the actual jobs performed by the available professional librarians. These jobs can vary from administrative duties, acquisitions and technical services such as cataloging and classification, to reference and readers' services. The degree to which users' needs are served depends on which of these duties are performed by professional librarians. This paper will in fact demonstrate that the performance of reference services in a research library in Nigeria by a professional librarian does affect the level of availability of publications to users.

METHODS

A survey of eighteen agricultural research institute libraries in Nigeria was carried out by means of a self-completed questionnaire. Sixteen of these institutes were established and financed by the federal government of Nigeria to promote agricultural research and production. One is an international institute for tropical agri-

Georgiana K. N. Nwagha is principal serials librarian, University of Science and Technology Library, Port Harcourt, Nigeria.

cultural research, while the eighteenth is the Faculty of Agriculture of the University of Nigeria. The institutes were chosen to ensure an even coverage of the different geographic regions of the country.

Each of the institute libraries was sent multiple copies of the questionnaire, and library personnel at the reference desk were requested to fill out one copy each time a research scientist made a demand for a publication during a period of six months. The aim was to enable the libraries to keep a record of the sources used in satisfying demands (whether from local stock or from another library), the satisfaction time (measured in hours or days), and the reasons for failure in cases where the demands were not satisfied. The questionnaire also requested that the rank of the reference personnel be stated; that is, whether the reference personnel was a professional librarian or a nonprofessional member of the staff.

After two or three reminders, fourteen of the eighteen libraries returned the completed questionnaires at the end of the recording period and a total of 506 forms were received. The questionnaires were coded and analysed by means of the Statistical Package for the Social Sciences (SPSS).

RESULTS

The initial analysis showed that only three out of the fourteen libraries had a professional reference librarian involved in completing the questionnaire. In the other eleven libraries, nonprofessional library personnel carried out the reference functions. It was further discovered that in the first group of libraries (that is, those with professional reference librarians), 85 percent of the demands made by the research scientists were satisfied, whereas 95 percent of the demands were satisfied in the second group of libraries (see table 1). These results would tend to indicate that the research libraries with nonprofessional reference personnel had a higher availability level than those with professional reference librarians.

However, further analysis of the data indicates that this was not the true state of affairs. Table 2 demonstrates that 99.2 percent of the demands made at the libraries without professional reference staff were satisfied immediately from the local stock of the libraries. On the other hand, only 67.5 percent of the demands were satisfied from the local stock of the group of libraries with professional reference staff. Also, while the latter group of libraries satisfied 32.5 percent of the demands made with materials obtained from other libraries, it was revealed that little interlibrary borrowing was done by the group of libraries without professional reference librarians.

There are two possible explanations for this situation. Either the second group of libraries did not engage in interlending because the nonprofessional reference personnel could not for some reason initiate interlibrary loan requests, or the researchers using these libraries did not request materials that were not available in the libraries. Considering that Nigeria is a developing country, it is not likely that these libraries are self-sufficient and could satisfy all the demands of the researchers, as indicated by the data. Rather, it was suspected that researchers using libraries whose personnel were nonprofessional were consciously suppressing some of their document needs because of a preconceived knowledge of the capabilities of

TABLE 1
PROPORTION OF SATISFIED DEMANDS

Types of Libraries	Satisfied Demands No.	%	Unsatisfied Demands No.	%	Total No.	%
Libraries with professional reference librarian	80	85	14	15	94	100
Libraries with nonprofessional reference personnel	391	95	21	5	412	100
Total	471	93	35	7	506	100

TABLE 2
SOURCES FROM WHICH MATERIALS WERE OBTAINED TO SATISFY DEMANDS

Type of Library	Demands Satisfied from Local Stock		Demands Satisfied with Materials from Other Libraries in Nigeria		Demands Satisfied with Materials from Libraries Outside Nigeria		Total	
	No.	%	No.	%	No.	%	No.	%
Libraries with professional reference librarian	54	67.5	22	27.5	5	4.0	80	100
Libraries with non-professional reference staff	388	99.2	2	0.5	1	0.3	391	100
Total	442	94.0	24	5.0	5	1.0	471	100

the library personnel serving them. Consequently, it was decided to test whether the rank of the reference personnel in the libraries surveyed had an effect on the information-seeking behaviour of the research scientists.

To do this, the actual demands made by the agricultural research scientists at the different institute libraries were categorized into two types of questions: simple locational questions and complex reference questions. This categorization was based on that of K. Emerson, who had categorized reference transactions into two main groups—directional questions and reference questions.[5] On the basis of this categorization, demands that were satisfied immediately, simply by locating materials on the shelves of the libraries concerned, were classed in the first category as simple or quick-reference questions. The other demands, satisfied after several days with materials from sources outside the library stock, were placed in the second category as complex reference transactions. The following two null hypotheses were then tested for their acceptance or rejection:

- There is no relationship between the rank or qualification of the library personnel manning the reference desk of a research library and the source from which materials are obtained to satisfy demands made.
- There is no relationship between the rank or qualification of the library personnel manning the reference desk of a research library and the type of questions asked by research scientists.

The two hypotheses were tested by carrying out a chi-square test of statistical significance between the two variables in each case, again using SPSS. Table 3 shows that the chi-square value for the first test is 119.56, with one degree of freedom. This is much greater than the critical chi-square value at the 0.05 level of significance, which is 3.84. This implies a rejection of the null hypotheses, and establishes that there is a relationship between the rank of the library personnel and the source from which materials were obtained.

However, since the chi-square test by it-

self could only indicate that the variables tested are related, it was found necessary to carry out two further analyses to assess the strength of the relationship between the two variables. The phi coefficient, which is specifically for 2 × 2 table, was found suitable, as it makes a correction for the fact that the value of the chi-square is directly proportional to the number of cases, by adjusting the *X* value. Both the phi value of 0.50 and the contingency coefficient value of 0.45 indicate that there is a fairly strong association between the two variables.

Table 4 shows that the chi-square value for the second test is 229.52, with one degree of freedom. This value is again much greater than the critical value of 3.84 at 0.05 level of significance. The null hypothesis could therefore be rejected and there is an indication that a relationship exists between the rank of the library personnel and the type of questions asked by research scientists. As in the case of the first hypothesis, both the phi and contingency coefficient tests for statistical significance were carried out to measure the strength of the association between the variables. The values of phi (which is 0.67) and the contingency coefficient (which is 0.55) both establish that there is indeed a strong relationship between the two variables.

CONCLUSION

The results of the above two tests have confirmed the suspicion that the agricul-

TABLE 3
CROSS-TABULATION OF RANK OF REFERENCE STAFF BY SOURCE OF DOCUMENT

Rank	Count / Row Pct / Col Pct / Tot Pct	Source: Local Stock	Source: Another Library	Row Total
		388.0	3.0	391.0
		99.2	0.8	82.8
	0	87.8	10.0	
	Nonprofessional	82.2	0.6	
		54.0	26.0	80.0
		66.7	33.3	17.2
	1	12.2	90.0	
	Professional	11.4	5.7	
	Column	442.0	29.0	471.0
	Total	93.6	6.4	100.0

Raw chi-square = 119.56 with one degree of freedom
Phi = 0.50330
Contingency coefficient = 0.44957

TABLE 4
CROSS-TABULATION OF RANK OF REFERENCE STAFF BY TYPE OF QUESTION

Rank	Count / Row Pct / Col Pct / Tot Pct	Type of Question: Simple Question	Type of Question: Complex Question	Row Total
		379.0	33.0	
		92.0	8.0	412.0
	0	95.0	30.8	81.4
	Nonprofessional	74.9	6.5	
		20.0	74.0	
		21.3	78.7	94.0
	1	5.0	69.2	18.6
	Professional	4.0	14.6	
	Column	399.0	107.0	506.0
	Total	78.9	21.4	100.0

Raw chi-square = 229.52 with one degree of freedom
Phi = 0.6735
Contingency coefficient = 0.55862

tural research scientists using those libraries manned by nonprofessional reference personnel were consciously suppressing some of their demands for documents. Were demands for materials outside the libraries' stock being suppressed because the researchers did not have confidence in the library personnel's ability to obtain such materials for them, or was it because of the poor success rate of such demands in the past? The answers to these questions can be established only through further research into the motives behind the information-seeking behaviour of the research scientists and into the reasons for present decisions in the deployment of librarians. This would require the adoption of qualitative research methods such as less formally structured interviews and free-flowing discussions. However, it may be concluded that the presence of nonprofessional library personnel in the reference context of some of the agricultural research libraries surveyed has contributed to the nonutilization of documents outside the stock of the libraries.

It should be pointed out here that all the eighteen research libraries surveyed had at least two professional librarians on their staff. Thus, the fact that eleven of the fourteen libraries that responded had nonprofessional reference personnel was a result of the internal deployment of staff in the respective libraries and not because of a total absence of professional librarians. Presumably, the professional librarians in these libraries were deployed in other service areas, such as administration, acquisition, or technical services, where their expertise was felt to be most needed.

This situation would tend to lead one to agree with Wilkinson and Miller that "at times, indeed, the field's pre-occupation with the internal mechanisms of library operation appears to have been little less than disfunctional in terms of the library's role in society. Expertise in selection, in processing and in administration are recognized by the initiated as being essential to effective library operation. To the public, however, recognition is given only to the end product—the ability of the library's staff to negotiate satisfactorily, a physical or intellectual translation of information that meets the user's needs."[6]

At the beginning of this article, it was stated that the primary aim of librarians is to serve users by providing them with access to recorded information. Professional librarians in Nigerian research libraries could make positive efforts to achieve this aim by deploying professional staff in reference services. Thus, professional expertise could be used for providing the clientele with access to needed documents irrespective of the location of such publications.

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Publication Quality Indicators for Tenure or Promotion Decisions: What Can the Librarian Ethically Report?

Barbara A. Rice and Tony Stankus

Academic faculties are becoming increasingly aware of the many capabilities of *Science Citation Index*,[1] *Social Sciences Citation Index*,[2] and *Arts & Humanities Citation Index*.[3] These indexes are used for subject searching, for obtaining lists of publications by a given author, for determining centers of certain types of research, for comparative evaluations of academic departments, and for evaluation of peers in tenure and promotion considerations. Although considerable controversy surrounds the use of citation counts for the latter practice, they *are* being used in such evaluations. It is not the purpose of this paper to reexamine or enter into the controversy surrounding the use of citation data in promotion or tenure considerations. The literature on this subject is voluminous. We wish to discuss the impact of online availability of citation data and provide information relating to provision and interpretation of search results by librarians. In addition, we recommend other types of information which the librarian should suggest to patrons in order to supplement citation data, or to be used when citation data is nonexistent or appears incomplete.

ONLINE CITATION SEARCHING

Until quite recently a patron wishing to determine whether or not a given author's works were cited could do a manual search of the appropriate citation index and come up with a tally, or more often, a tally and listing of who was citing the author being evaluated. In order to do an effective search it was necessary to understand how the index worked, and it is likely, although not guaranteed, that the searcher would read the introductory material to learn how to do the search and become aware of some of the difficulties inherent in compiling a listing which are due to the nature of the index. For example, in doing a manual search it is likely that the patron would become aware of the fact that only the first author is listed in the citation index and that, by tracing the citation to the source index, would realize that there might be more than one author of the same name. However, with the advent of online availability of these indexes, this is no longer the case. A patron can bring in a list of references, leave them with a searcher, and return to pick up a list of citations. Although Caldwell and Livingston[4] state that "citation indexes provide a way to determine how highly valued and widely read the research produced by your faculty is," we caution that the process is not as simple as running an online search, as these authors imply.

The librarian performing a citation search has an ethical responsibility to inform the patron of the nature of the citation index being searched, with the inherent limitations this places on the search. The patron should also be provided with information on known citation practices in the evaluation field and references to the literature, which give caveats relating to the application of the references obtained in evaluation procedures.

Before attempting the search, the searcher should discuss the list of references with the patron to ensure that it is complete, and that the patron understands the search process. It is frequently

Barbara A. Rice is principal librarian for reference services, New York State Library, and Tony Stankus is science librarian, Science Library, College of the Holy Cross, Worcester, Massachusetts.

the case that the person gathering the information sends a graduate student to deliver the list and, if required by the library, participate in the search interview or search process. *The librarian should not permit this.* The limitations of the index and search capabilities are difficult to explain and the searcher should not assume that the student will convey all information to the requester.

During the interview the searcher should examine the submitted bibliography carefully to see that references are complete and that actual first authors are given. Cited items are listed only by the first author in the citation indexes. Therefore, simply doing a search to find items citing Jane A. Doe will find only those papers which list her as sole author or first author, but will not retrieve those papers where she is second or third author unless the first author is provided.

Whether or not this is important is discussed by Garfield.[5] It is decidedly important that the requester know whether or not his bibliography is accurate in this respect and, if not, what qualifications this imposes on the search results.

The patron must also be made aware of the scope of the particular citation index being searched and be shown the list of journals covered. Each citation index covers the most heavily cited journals in each field covered, but there are certain academic specialties for which the source journals might not be a very comprehensive list of works citing the author being evaluated. A quick way to check is to see whether the author's own papers are listed in the journals as possible citations. If a majority are not, the searcher should advise the patron of the alternative strategies discussed later in this paper.

Another difficulty sometimes encountered is that the index cannot distinguish between two people having the same last name and first initial, who may be publishing during the same time period. The patron should understand the necessity for examining the search results carefully for entries that seem to be in a field different from the author being evaluated.

COMPARATIVE CITATION PRACTICES IN DIFFERENT FIELDS

As Garfield points out, "It certainly is improper to make comparisons between citation counts generated in different fields."[6] Not only are there differences with respect to the average number of citations in a given field, but there are differences with respect to the type of material cited, e.g., mathematicians cite books more often than chemists. *Science Citation Index* and *Social Sciences Citation Index* primarily examine journal sources for citations.

What then can the searcher give to the patron relating to citation practices in different fields? It is recommended that the user be given a reprint of Garfield's chapter entitled "Perspective on Citation Analysis of Scientists"[7] for a summary of known norms in the sciences. In actuality, limited information is available, but it should encourage the user to consider what norms should be used and what significance any raw number of citations, whether 0 or 5 or 500, means in the field where the information supplied is to be used. The average annual citation rate for a scientific paper is only 1.7 and many papers published are not cited at all. Endler,[8] in studying Canadian psychologists using *Social Sciences Citation Index,* reports that during 1975, 40 percent of those studied had zero citations and three out of every five had two citations or less. "A disproportionately large amount of citations and publications is accounted for by a disproportionately small number of individuals," Endler stated. Helmreich[9] also points out that there are large sex differences in citation rates among psychologists and analyzes possible causal factors.

If no norms are known for the candidate's field, it is conceivably possible to construct them using the following technique: the patron supplies a list of departments considered to be of comparable nature (e.g., size, national reputation, student body, etc.). Using the corporate source index of the appropriate citation index, the number of papers from each of these institutions is tallied. Then an aver-

age number of papers per faculty member can be obtained by dividing the total number of papers by the number of faculty. This could be done for one year, or, preferably, for several years. Such techniques have been used for comparing institutions.[10,11,12] Alternatively, the records of only those faculty from these peer institutions whose specialization matches that of the candidates could be found.

As noted earlier, *Science Citation Index* and *Social Sciences Citation Index* examine predominantly journal sources for citations. Citations appearing in most books are not included, although books cited in the journals scanned are. Citation counts may or may not include citations to book reviews, and what would seem apparent here is that it is not as important to know whether or not there was a review, as it is to know what the review stated as to the quality and importance of the book being reviewed. A librarian should know the major review sources in any field and can assist the patron compiling the information for the promotion or tenure review to ferret out reviews should the candidate's vita include books as well as journals.

The searcher should inform the patron that a library staff member, knowledgeable in the use of citation indexes, is available to discuss the search results and interpret the results and other techniques which should be considered in order to obtain as complete information as possible on citations to the work of the individual being evaluated.

The use of the citation data in promotion and tenure processes has been urged as a quantitative, objective standard of evaluation. Given the little that is known about norms, it does not seem that citation data is yet a wholly effective tool in this respect. What if no norms are known for the candidate's field? What if the candidate's publications are very recent and have not yet been cited, or cited comparatively little? What then? The librarian, in addition to supplying information on known norms, should suggest other information relating to the journals in which the candidate has published which can be of use in the evaluation process.

Information about the quality of the journals within which the candidate being evaluated has published can easily be supplied by librarians. An evaluator may wish to consider some or all of the following factors in addition to or in lieu of citation information.

- What is the purpose of the journal?
- Who publishes the journal?
- What types of articles does it carry?
- Who are the editors and referees?
- What role do the editors and referees play in the acceptance or publication process?
- What institutions are represented among contributors?
- Who are the individual contributors?

JOURNAL PURPOSE, PUBLISHER, AND TYPES OF PAPERS

Journals cited in the vita may be characterized by purpose, publisher background and specialization, and the nature of the papers being published. There are many for-profit firms, university press, and professional societies which are known to be quality publishers. Most librarians can list publishers of known repute in various academic disciplines. The librarian, however, should not report unsubstantiated hearsay, but should instead gather factual information for analysis. This may be types of journals published, e.g., scholarly versus popular, general fields in which the publisher specializes, e.g., scientific, legal, etc., and the number of journal titles published. If the publisher is a society, then information on the society's membership and purpose should be reported.

The type(s) of paper(s) carried is also a consideration in evaluating the nature of the candidate's contribution. For example, is it a review journal or does it consist of original research contributions? Is it an informal news bulletin—an alumni journal, for example? Is the contribution of the candidate a full-length article? Book review? Brief communication? Letter to the editor? Are there special requirements for publication, e.g., membership or alumnus status? While some of this information may be known to the individual requesting the information, it may not all be

known, nor may it be known uniformly through the department or by other persons or review bodies which are often involved in the evaluation process, such as a campus-wide promotion and tenure committee or the vice-president or president of the college or university. Samples of specific information which a librarian might compile follow.

1. *The Journal of "A" Studies,* founded in 1948, publishes about 200 eight-to-fifteen-page contributed, original research papers each year in the general field indicated by the title. It also publishes monthly society personnel news, an editorial, five to ten book reviews, and job placement notices. It is sponsored by the Society for "A" Research and Treatment, located in New York, which has a membership of 12,000. Membership is open to those with an M.D. or Ph.D. in an appropriate discipline who demonstrate an interest in the field and can provide references from two established members. Membership is not necessary for acceptance of an article, although members do not have to pay page charges. The candidate is a member and the publications 1 and 5 in his vita represent a research article of standard length for this journal and a standard length, 200-word book review, respectively.

2. *The "B" Review* has been published by the Midwestern University press since 1975. It is the only journal published by them. Each year it publishes approximately 30 twenty-to-forty-five-page surveys of recent developments in law and politics. Articles are written largely by its own students, faculty, and alumni. It appears on a trimester basis with the spring issue listing biographies of honorary-degree recipients, the text of commencement speeches, and a directory of recent graduates. The candidate is an alumnus of this institution. His contribution, number 8 on the vita, is a letter to the editor criticizing the choice of an honorary degree recipient and rebutting that recipient's article in a prior issue.

3. *Acta "C" Internationalis* has been published since 1960 by Alexandrian Press, a for-profit scientific, technical, and medical publishing house which currently publishes about 300 journals in New York, Paris, London, and Vienna. *Acta "C" Internationalis* is a bimonthly organic chemistry journal which carries an annual total of approximately 70 twenty-to-twenty-five-page overviews of recent research, approximately 400 eight-to-twelve-page contributed articles, approximately 250 four-to-six-page brief communications, and approximately 300 paragraph abstracts of presentations at professional symposia in the field. Publications 1, 2, and 3 on this candidates vita are abstracts from the symposia. Item 4 is a brief communication of the results announced in the first abstract, and item 5 is an article of standard length elaborating on the findings of the second and third abstracts.

JOURNAL RANKINGS AND REJECTION RATES

Another possible way of describing the importance of a given journal is to use *Journal Citation Reports,* an annual compilation which is part of *Science Citation Index* and *Social Sciences Citation Index,* which rank journals in several ranking packages, e.g., total citations and impact factor. The experiences of author Stankus working with use of impact factors to provide information on science journals in promotion and tenure decisions has been that stronger candidates have published in journals with relatively high impact factors.

Rejection rates are a piece of information that is not always readily available, but in some cases can be found by digging through the front matter of journals, or in the annual reports of publishing houses or societies. The information is usually available on request from the editor or publisher.

EDITORS, REFEREES, AND CONTRIBUTORS

Another important consideration in journal quality is the prestige of its editors and referees. While there is no guarantee that all members of an editorial board are actively involved in the journal, or that stated refereeing policies are followed, information about the reputations of the editors and referees can be gathered from biographical directories. For example,

American Men and Women of Science can supply an outline of factual information. A quick literature search can establish the extent of a given editor's or referee's own publication history. Compilations of academic institutional evaluations, e.g., Anderson & Roose's *Rating of Graduate Programs*, can give an idea of the degree of distinction of the program with which the editor or referee is affiliated. Some sample information that might be supplied follows.

1. The editors of *Journal "X"* are Jones, Harvard University; Smith, University of Chicago; and Johnson, University of California, Berkeley. Jones, Smith, and Johnson are all full professors in programs rated by Anderson & Roose as distinguished. Jones and Johnson are members of the National Academy of Sciences. Manuscripts are read by one of the editors plus two outside referees of his choosing.

2. *"Y" Journal* has more than sixty listed editors. A sampling shows that slightly more than half are affiliated with clinical programs in drug and alcohol abuse, while the remainder are equally divided between highly rated schools of social work or psychology. Manuscripts are sent to the editor in chief who designates three of the editors as referees.

3. *The Yearbook of the "Z" State University Teaching Effectiveness Workshops* is edited by a committee drawn from the chairpersons of the departments of education at each of the university's branches. Workshop faculty and all working teachers who plan to attend furnish an outline of their presentation three months before the meeting for review by all members of the board. Approximately 10 percent are selected for general presentation at the meeting and subsequent printing in full in the yearbook. The remaining are accepted for poster presentations with subsequent printing as one-page summaries.

In addition to evaluating editors, all of whom may have been selected for high repute in their fields, it is also possible to sample contributors. Virtually every author makes some commitment to a journal by having submitted a paper to it. An author's choice of journals lives on in personal biographies which the author (if academic) is aware will be reviewed by tenure or promotion committees, for grant proposals, etc. In the aggregate, academic departments gain a reputation by publishing in the best journals, and the best journals are characterized by repeatedly publishing the work of the best departments. Consequently, librarians can use online techniques to sample departments to see which have contributed to a journal in which the candidate has published.

CONCLUSION

Academic librarians who are asked to supply information for tenure or promotion decisions have an ethical responsibility not only to supply the requested information but to educate the requester in the limitations of any search techniques used (manual or online) and the types of factual information that can be supplied. Librarians should require from requesters that they participate in the search process (especially in the case of online searches) and provide a clear statement of what is being asked for. The authors believe that the issues raised in this article merit serious discussion by academic librarians, which would result in statements of library policy with respect to library participation in provision of information to faculties for promotion or tenure consideration.

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"Non-Depository" or Not: An Examination of the Designation of Non-Depository Titles in the *Monthly Catalog of United States Government Publications*

Steven D. Zink

The *Monthly Catalog of United States Government Publications* includes citations to various government publications not distributed to federal depository libraries by the Superintendent of Documents. For the most part these elusive publications represent titles which are produced in regional government printing facilities or by private contractors for a government agency. Although this distinction alone does not preclude distribution to depository libraries, the sheer lack of available copies has frequently resulted in *only* an entry in the *Monthly Catalog*.[1] The sole distinction in the *Monthly Catalog* entries between these non-depository titles and the publications distributed by the Superintendent of Documents is that the depository publications are distinguishable by an item selection number and a black dot (•). The black dot simply indicates that the title was available for distribution to depository libraries and that, at the very least, regional depositories, as required by law, have a copy of the publication. The item selection number is even more crucial. The nearly 5,500 current item numbers represent all of the possible categories of publications available which selective depository libraries may elect to receive. For example, item number 17 represents the *Yearbook of Agriculture*. If a depository would select that item number, it would annually receive the *Yearbook of Agriculture*. Therefore a depository is capable of establishing a selective profile to suit users' needs much like a library would with an approval plan. Absence of these two elements indicates that the publication was not available for distribution to depository libraries. In an effort to have as complete a collection of government publications as possible, many depositories have sought to acquire some or all of these non-

Steven D. Zink is head, Government Publications Department, University of Nevada Library, Reno. *The author wishes to thank library intern Jeanne Smith for her assistance in compiling the data used in this article.*

depository publications. For the past thirty years the most effortless means of obtaining these titles has been through a subscription to the Readex Non-Depository Microprint Collection. Since 1953, through an agreement with the Library of Congress, the Readex Corporation has been locating and converting into microprint all government publications listed in the *Monthly Catalog* but not distributed through the Superintendent of Documents depository library program.

In late 1981 the Government Publications Department of the University of Nevada–Reno (a regional federal depository with a collection exceeding one million documents) undertook a study of this service by attempting to acquire these non-depository publications by means other than through subscription to the Readex Non-Depository Microprint Collection.[2] One unexpected finding was that the placement of the item selection number and black dot data elements in the *Monthly Catalog* entries was far from completely accurate.

As a part of the analysis, the entries of the first seven issues of the *Monthly Catalog* for 1981 were monitored and requests were sent to the agencies authoring the publications for a copy of the non-depository titles listed. A request for each publication was also submitted to the Library of Congress' Documents Expediting Project using its special request service.

As solicited non-depository publications began to be received and subsequently shelved in the department, it became clear that many duplicated depository publications were already on the shelves. After careful checking and rechecking, it was discovered that of the 234 non-depository titles listed in the January through July 1981 *Monthly Catalog*, 94 (or 40 percent) of all the non-depository titles had in fact already been received through the depository library program.* Thus 40 percent of the titles designated in the *Monthly Catalog* as being non-depository (by the absence of the black dot) were, in fact, received on a depository basis (see table 1). The original number of erroneous citations was in actuality somewhat higher, but the Government Printing Office subsequently discovered five entries which were in error and noted that corrections should be made to the *Monthly Catalog*.[3]

These errors in the *Monthly Catalog* have a number of serious consequences for the users of government publications. Perhaps the greatest concern connected with these omissions is the most obvious. Librarians in hundreds of depositories that do not subscribe to the Readex Non-Depository Collection tell their patrons, when searching through the *Monthly Catalog*, that the library could only possibly own those publications received on a depository basis and cited with a black dot. Hence, 40 percent of the time such an assertion for a complete depository would have been incorrect if the *Monthly Catalogs* covered in this study had been used. The patron would never have utilized the materials readily available on the library's shelves.

Consequences of these errors also afflict subscribers to the Readex Non-Depository Microprint Collection. The basis for inclusion of titles in the Readex Non-Depository Collection is the absence of the black dot in the *Monthly Catalog*. When the black dot and item number are mistakenly deleted from an entry for a depository title, the patron will be led to believe that the library only has a copy of the publication in microprint, thus limiting its circulation and, in many instances, its usefulness to the patron. If the citation is taken from a *Monthly Catalog* of the past two or three years, the patron will be told that the library does not even own a microprint copy due to the current time lag in receipt of the Readex microprint.

The error in failing to accurately place the item number and black dot in the *Monthly Catalog* citation for depository titles is not without its fiscal considerations. Depository libraries purchasing the

*The depository status of certain titles was double-checked for accuracy by Roberta Scull against the holdings in the Government Documents Department at Louisiana State University.

TABLE 1
ACCURACY OF NON-DEPOSITORY TITLE DESIGNATION IN THE *MONTHLY CATALOG*

Monthly Catalogs	Total Titles Designated as Non-Depository	Titles Actually Non-Depository	Titles Actually Depository	Percent Erroneously Not Designated as Depository
Jan. 1981	6	4	2	33
Feb. 1981	9	6	3	33
March 1981	30	22	8	27
April 1981	67	34	33	49
May 1981	22	11	11	42
June 1981	26	15	11	42
July 1981	74	48	26	35
Total	234	140	94	40

Readex Non-Depository Microprint Collection will receive and pay for those titles incorrectly indicated as non-depository in the *Monthly Catalog*. In times of tight budgets, such needless duplication of depository titles in microprint is disturbing. Based on the Readex subscription price of over $2,000 for the non-depository publications in the 1980–81 fiscal year, a consistent 40 percent error rate would have resulted in over a $900 expenditure for duplicated depository titles in microprint. Multiplying the cost of this unfortunate duplication by the number of depositories subscribing to the Readex Non-Depository Collection makes these errors, collectively, very expensive.

One question that naturally emerges out of a study of non-depository publications is why there are today *any* non-depository publications in the *Monthly Catalog*. The basis for the traditional listing of non-depository publications was that only a single copy of each title, required for cataloging and classifying, was received by the Government Printing Office and thus distribution was impossible.[4] The problems inherent in an agency supplying too few copies or even only one copy for distribution to depository libraries should not pose a problem today. Given the size of the current Government Printing Office's microfiche program (GPO estimates that it will distribute 53,000 different titles in microfiche in 1982),[5] it stands to reason that when the Government Printing Office receives a copy of a title for cataloging and inclusion in the *Monthly Catalog*, it could make a microfiche copy for distribution to depositories. GPO has the capability to do this. Without question, current non-depository documents would receive more widespread use at far less expense than is presently the case. If all non-depository materials currently noted in the *Monthly Catalog* cannot be integrated into depository distribution, it is imperative that tighter quality control be instituted to curb the grievously high error rate observed in designating which materials are depository or non-depository. Not only are such errors costly, inconvenient, and a disservice to the documents-user community, but they undermine confidence in the reliability of the entire *Monthly Catalog*.[6]

REFERENCES

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2. Steven D. Zink, "Analysis of Non-Depository Documents in the Government Publications Collection," *Collection Building: Studies in the Development and Effective Use of Library Resources* 4:39–43 (1982).
3. *Monthly Catalog of United States Government Publications* 1044:xii (Aug. 1981), 1045:xii (Sept. 1981), 1047:xiii (Nov.-Dec. 1981).

4. Joe Morehead, *Introduction to United States Public Documents* (2d ed.; Littleton, Colo.: Libraries Unlimited, 1978), p.87.
5. U.S. Government Printing Office, "Comparison of Paper and Microfiche Distribution to Depositories" (distributed at Depository Library Council Meeting, Boston, April 1982).
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Bowen, Howard R. *The State of the Nation and the Agenda for Higher Education.* San Francisco: Jossey-Bass, 1982. 212p. $13.95. LC 81-20746. ISBN 0-87589-515-8.

Howard R. Bowen is R. Stanton Avery Professor of Economics and Education at the Claremont Graduate School. A former chief academic officer of Grinnell College, the University of Iowa, and Claremont University Center, he is a distinguished senior economist who, of late, has turned his attention increasingly to the economics of higher education. Bowen offers a thoughtful appraisal of both the nation and of American higher education in his book, accompanied by an ambitious long-term agenda for an expanding societal role for universities and colleges.

It is a relatively short book—eight chapters, comprising 155 pages, with extensive statistical appendixes providing summary data in support of the author's assessment of the economic, social, and educational condition of the nation. Among his major conclusions are that the period since 1950 has been one of extraordinary economic and social progress that can be related directly to the postwar expansion of American higher education. Although access to the university has increased greatly over the last three decades, a substantial portion of the population remains inadequately educated.

America, Bowen writes, must begin to address a set of major unresolved domestic and international problems in the economic, social, and political spheres. Our collective failure to date to deal effectively with issues ranging from disarmament to drug abuse can be attributed at least in part to the decline of an underlying set of common values "that actuate the economic and political system." Given the diminishing influence of family, church, and workplace, Bowen looks to higher education as potentially "the premier place in our society that is capable of effective leadership and sustained independent effort in the realm of values." He calls for a restoration of the balance between liberal and vocational education. "The need," he urges, "is to restore and extend the ancient ideal of the well-educated man or woman who is both broadly learned and imbued with social responsibility." The university should reassert its historic primary mission, "to transmit worthy values to the people who in turn will guide the government and the economy toward the conditions of a good society."

Bowen's book, however, is neither a naive analysis nor a simplistic prescription for educational reform, and any effort to summarize this eloquent and persuasive philosophical essay inevitably does a serious injustice to both the book and its author. The tone is consistently candid ("most institutions . . . live or die according to their ability to attract students"), realistic ("to achieve widespread international understanding would call for more than tinkering with the curriculum"), and temperate ("stating the ideals is, of course, not the same as achieving them, but it is a beginning").

Stating the ideals is a potentially important new beginning for American higher education, or (more accurately perhaps) a timely revival of a central academic philosophical tradition of liberal learning and humanistic values that can be traced

through Adler, Hutchins, and Whitehead to Mill, Newman, Bacon, Aristotle, and Plato. While the times may appear unpropitious for new ventures, the obligation of educators, Professor Bowen correctly reminds us, is not to "supinely accept the present situation as permanent but . . . [to] continually present new long-range possibilities to the public and their leaders."

This book is about what higher education could potentially become and about what it could potentially contribute to American society. As such, it is a welcome contrast to much of the current literature of academic planning, and recommended reading for all who have a serious concern for the future of the university.—*Thomas J. Galvin, School of Library and Information Science, University of Pittsburgh.*

[Editor's note: This book recently received the Frederick W. Ness Book Award for the outstanding publication of the year on a subject dealing with the liberal arts, from the Association of American Colleges.]

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Goodrum, Charles A. and Dalrymple, Helen W. *The Library of Congress.* 2d ed. Boulder, Colo.: Westview Press, 1982. 318p. $25 cloth, $10.95 paper. LC 82-8457. ISBN 0-86531-303-2 cloth; 0-86531-497-7 paper.

The first edition of this work was written solely by Goodrum and published as part of the Praeger Library of U.S. Government Departments and Agencies series. A number of changes at the Library of Congress, including the sizable reorganization effected in 1977 under the direction of Librarian of Congress Daniel J. Boorstin, obliged Goodrum and coauthor Helen W. Dalrymple to issue a revised and updated version of the 1974 work. The result is a pleasing and useful account of the Library of Congress, the world's "largest center for information storage" (Introduction).

In an unobtrusive and easy writing style, the authors structure their narrative in four parts. Part one traces the history of LC from its beginnings to the present, including a chapter on its current components. We are told of its major units ("six great empires") within which "eighty-five independent operations" function; an organizational chart provides guidance through the maze. Part two describes the internal processes: acquisitions, control, and research services. Here the authors wax eloquent about the treasures to be found in the manuscript, geography, and map collections, as well as other divisions and collections. There are informative discussions on the importance of gifts, the copyright deposit procedures, the awesome responsibilities of the Congressional Research Service, the famous "K classification" of the law library, services to the blind and physically handicapped, and the several "glamour" collections and activities, such as music, poetry, and the John F. Kennedy Center for Performing Arts Library.

Part three addresses the problems and tensions that arise from LC's efforts to serve three demanding clients: the Congress, the library profession, and the scholarly research world. The authors wryly observe that these groups "barely tolerate each other at best, and at worst, they resent each other bitterly." Dis-

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cussed in detail is the vexatious, perennial dispute inherent in an organism that attempts to be on one hand a library *for* Congress, and, on the other, a library for everyone. Although this section of the book is of great interest, one questions with raised eyebrows the assertion that "for years, librarians have been urging that the Library of Congress be put into the Department of Education," an entity that has only been in existence since 1980 (90 *Stat.* 668). Part three also notes LC's initial reluctance to accept the computer (followed by its subsequent embrace), the difficulties of locating materials at the Library, and Boorstin's impact upon the institution he directs. The last part is a brief comment on the future of LC as it begins to harness the technological wonders of videodiscs and digital storage in the service of enhanced control and access.

Throughout the narrative run basic philosophical issues. Does LC really help Congress govern? Is the Library doing a proper job of preserving the nation's history? Are the manifold information needs of users really being met? While the conclusion is affirmative, it is tempered with the caveat that future managers of this vast enterprise must be ever alert to the processes and technologies by which its disparate clientele will be served wisely and well.

This informative monograph contains a six-page bibliography. No index was available for evaluation, presumably because the above review is based on a "not for sale" advance copy made from uncorrected proofs. With the assumed inclusion of an index, the book when published will be a valuable addition to our professional literature and may well enjoy a wider audience.—*Joe Morehead, School of Library/Information Science, State University of New York at Albany.*

Neustadt, Richard M. *The Birth of Electronic Publishing: Legal and Economic Issues in Telephone, Cable and Over-the-Air Teletext and Videotext.* White Plains, N.Y.: Knowledge Industry, 1982. 143p. $32.95. LC 82-6614. ISBN 0-86729-030-7.

Ever since "the paperless society" became buzzwords in our language, there have been many discussions debating the pros and cons of electronic publishing. The discussions this reviewer has heard have typically been subjective and sometimes emotional. The issues raised have related to the emergence of a new mass medium, described eloquently by the author:

> Until recently, mass distribution of information has been dominated by publishing and broadcasting. Now, technology is marrying these media to spawn a new one: electronic publishing. Print-type information—text and graphics—is being distributed over electronic channels: television, radio, cable TV and telephone wires.
>
> Electronic publishing . . . has no place in the law at present. No statute or regulation mentions it, and the first court decision on this medium was issued in the fall of 1981. In the next few years, policy-makers must answer a string of questions to fill this vacuum. How will the First Amendment apply—will electronic publishers have the full freedom of newspapers or will they be covered by content regulations, as are broadcasters? Will would-be electronic pub-

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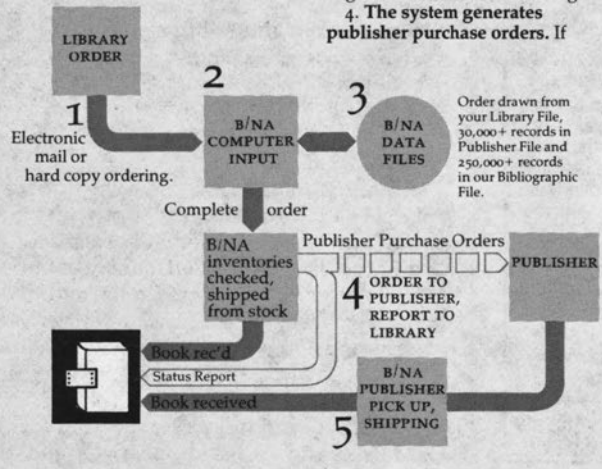

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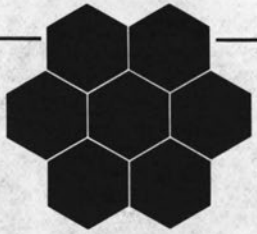

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lishers have access to the electronic channels of communication—is regulation needed to ensure diversity and competition? Should the government set technical standards to make systems compatible or should it leave that issue to the marketplace? Are privacy policies needed to protect consumers from misuse of the vast data banks the new technologies will create? Does current copyright law adequately protect the investments of those who create the information?

The book is written for the stakeholders in this new mass medium—newspapers, phone companies, cable companies, and book publishers—as well as for those who must devise new laws, enforce the laws, and test the laws for the lay public whose interests must be protected.

The content deals primarily with communications policy—current and proposed—and includes discussions of technical standards, privacy, defamation and obscenity, and economic rights. A brief but useful chapter, "How Electronic Publishing Works," sets the stage for delving into the text.

Librarians should read this book—if for no other reason than to understand that growth of the new medium cannot be resisted, and that the time is *now* for serious consideration of how the library will assimilate this new technology. The book is well written and interesting to read.—*Allen Kent, University of Pittsburgh.*

Spigai, Fran and Sommer, Peter. *Guide to Electronic Publishing: Opportunities in Online and Viewdata Services.* White Plains, N.Y.: Knowledge Industry, 1982. 100p. $95. LC 81-20787. ISBN 0-914236-87-3.

Some publishers would call this book a "special report" because it provides concise information aimed at specialized audiences. The specialized audiences appear to consist of: (1) venture capitalists and (2) print publishers. The first audience would be interested in assessing new business opportunities, the second in deciding when, if ever, to adopt new technology.

The book addresses two technologies, one relating to online services and the other to viewdata services. The technologies of these electronic publishing examples are presented in a jargon-free man-

ner, suitable for nontechnical business executives. The book provides considerable quantities of data about suppliers and costs. Planning, staffing, and marketing approaches are also presented. All this is aimed at helping to make decisions as to whether viewdata and online publishing should be in the future of a publisher.

The general introduction points out:

Print publishers are captivated by the almost daily reports of the launch of a new viewdata experiment, the creation of a new online data base, a new development in microprocessing that is driving costs down even further. At the same time publishers are naturally concerned about the almost daily increases in the costs of postage, handling, fulfillment, print and paper.

Quite rightly, they are looking at the promises of technology and computer vendors; with reason they are questioning these promises. This report answers many of the questions print publishers are asking about the new media of viewdata and online services. Perhaps more importantly, it tells print publishers what questions to ask themselves, and how to find the answers.

This promise is fulfilled quite well as long as the alert is kept in mind that:

Readers should be aware that electronic publishing is a rapidly moving field, with changes in prices, services, etc. occurring almost daily. Statistical information in this report is based on data accumulated in spring 1981.

—Allen Kent, University of Pittsburgh.

ABSTRACTS

The following abstracts are based on those prepared by the ERIC Clearinghouse of Information Resources, School of Education, Syracuse University.

Documents with an ED number here may be ordered in either microfiche (MF) or paper copy (PC) from the ERIC Document Reproduction Service, P.O. Box 190, Arlington, VA 22210. Orders should include ED number, specify format desired, and include payment for document and postage.

Further information on ordering documents and on current postage charges may be obtained from a recent issue of Resources in Education.

Center for Research Libraries Study, Concordia University. Final Report. By J. Tallon. 1979. 16p. ED 217 847. MF—$0.83; PC—$1.82.

This discussion of the implementation of services related to the Center for Research Libraries (CRL) if Concordia University Libraries were to join CRL includes policies and procedures designed to assist Concordia in making effective use of CRL's services without sacrificing regular services or incurring large expenses in addition to the membership fee. Included in the report are a history of the CRL proposal; a 1978 report by Derek Robertson recommending that the library join CRL; recommended policies and procedures; recommendations for publicity to make patrons aware of CRL and particular collections that might pertain to their field of research; and recommendations for monitoring and evaluating interlibrary loan benefits (cost savings), user benefits, collections benefits, and the costs involved in membership. Appendixes include a description of CRL's art and architecture collection and a flowchart of interlibrary loan procedures at Concordia.

Comparative Study on the Handling of Serials by ISDS Centres and National Bibliographic Agencies. By Francoise Bouffez and Annette Grousseaud. United Nations Educational, Scientific, and Cultural Organization (UNESCO), Paris (France). 1980. 171p. ED 217 831. MF—$0.83; PC—not available from EDRS.

A survey was conducted in July 1977 of thirty-eight centers of International Serials Data System (ISDS) and of national bibliographic agencies or comparable bodies in the same countries to study the various aspects of the identification and description of standardized bibliographic data by the ISDS and the International Standard Bibliographic Description for Serials (ISBD). Nine requests for information were also submitted to countries considering ISDS membership. Analysis of the survey and materials returned with the questionnaires are reported in five chapters: (1) bibliographic information sources available for establishing an ISDS national center and serial control methods, including both primary and secondary sources and an appraisal of bibliographic control by country; (2) establishment of ISDS centers, re-

viewing structure, background, and location selection; (3) functioning of the centers in terms of personnel and internal organization; (4) a comparative study of the handling of serials by ISDS centers and national bibliographic agencies (NBA); and (5) objectives of the national centers and roles of the NBA and the ISDS network. Provided are a glossary of acronyms and abbreviations, twelve tables, and nine annexes (diagrams and charts).

Report on Investigations into Delays in the Interlibrary Loans Process. By James Tallon. 1980. 10p. ED 217 849. MF—$0.83; PC—$1.82.

Data on interlibrary loan transactions occurring during July and August 1979 were analyzed to determine comparative turnaround and delivery times for five Quebec and eleven Ontario universities. The numbers of working days of positive responses for loans and photocopies and the numbers of positive and negative responses for combined loans and photocopies were calculated by subtracting the date that a request was made from the date when the request item or negative response was received. It was found that there is a considerable difference in turnaround times between Quebec and Ontario universities and for photocopies and loans; negative responses constituted 25.7 percent of the replies to requests made to Ontario universities and 27 percent of the requests to Ontario universities. Discussion of the findings includes suggestions for the improvement of interlibrary loan services, and four tables of data are appended.

Report on the Utilization of the CAN/OLE Online Document Ordering System (CAN/DOC) in Interlibrary Loan Operations. By James Tallon. 1980. 12p. ED 217 851. MF—$0.83; PC—$1.82.

The study reported was conducted at Concordia University after using the CAN/DOC ordering system to procure documents in the sciences directly from the Canada Institute for Scientific and Technical Information (CISTI) to assess the efficiency of interlibrary loan (ILL) procedures using this system. This study focuses on the relative turnaround times and costs of CAN/DOC and possible alternatives. Present ILL procedures are described, a de-

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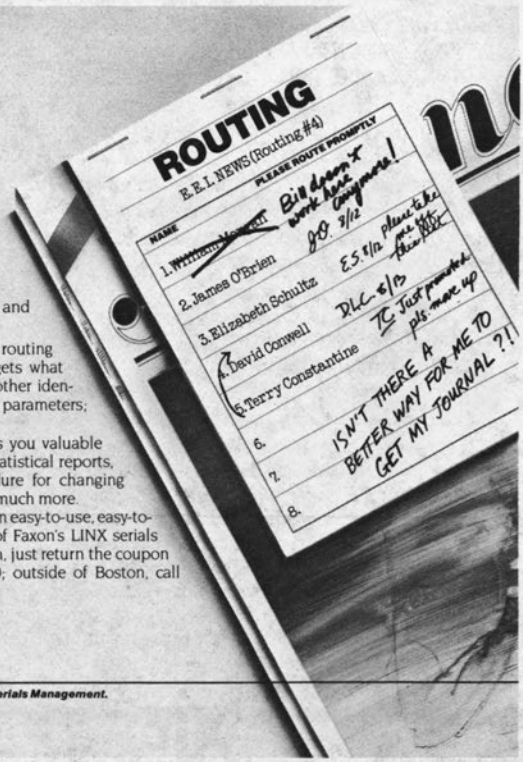

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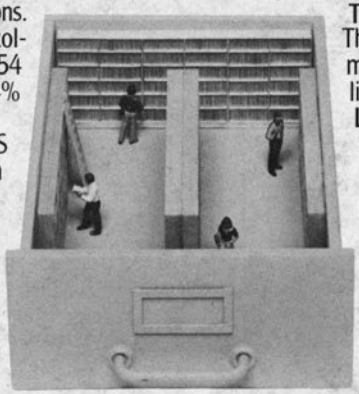

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tailed breakdown of the average delays and cancellations is given, and costs are analyzed. The costs of four alternative models for the ordering of requests available at CISTI are outlined. It is recommended that requests of scientific documents available at CISTI be ordered via Telex, with CAN/DOC used only in special circumstances, because of the 50 percent saving in cost per document ordered; that preference be given to ordering from CISTI over Quebec or Ontario university libraries because of the faster service provided by CISTI; that the use of CAN/OLE for document verification be continued; and that efforts be made to encourage CISTI ILL and government officials responsible for its operation to improve the interlibrary loan service. Data are presented in five appended tables.

Report on the Use of REFCATSS for Interlibrary Loan Processing. By James Tallon. 1980. 9p. ED 217 850. MF—$0.83; PC—$1.82.

The database contents, search features, and costs of two services offered by UTLAS (University of Toronto Library Automation Systems) are compared to determine which of the two should be used for interlibrary loan (ILL) processing at Concordia University. A review of studies of CATSS (Catalogue Support System) is provided, as well as a description of the search facilities common to CATSS and REFCATTS (Public Service Support System), and a comparison of the costs of interlibrary loan searching on the two systems. It is recommended that, by virtue of the greater suitability of REFCATSS and ILL use and the dubious cost advantage of CATSS given the anticipated level of use, that REFCATSS be used for ILL searching. Also discussed are arrangements for access to terminals on the three campuses to avoid the high cost of registering an additional terminal for ILL use, and the costs of setting up and training for REFCATSS. Estimates of one-time and ongoing costs are provided, and procedures for implementing the use of the system are outlined. Seven references are listed.

ERIC Processing Manual. Rules and Guidelines for the Acquisition, Selection, and Technical Processing of Documents and Journal Articles by the Various Components of the ERIC Network. By Ted Brandhorst, ed., and others. Educational Resources Information Center (ED/NIE), Washington, D.C.; ERIC Processing and Reference Facility, Be-

thesda, Md.; ORI, Inc., Bethesda, Md. Information Systems Division. 1980. 788p. ED 219 082. MF—$1.51; PC—$48.32.

This loose-leaf manual provides the detailed rules, guidelines, and examples to be used by the components of the Educational Resources Information Center (ERIC) network in acquiring and selecting documents and in processing them (i.e., cataloging, indexing, abstracting) for input to the ERIC computer system and subsequent announcement in *Resources in Education* and *Current Index to Journals in Education*. It also covers the procedures to be followed in maintaining the indexing vocabularies (the *Thesaurus of ERIC Descriptors* and the *Identifier Authority List*). The major sections of the manual are entitled "Acquisitions," "Selection," "Handling and Shipping," "Cataloging," "Abstracting/Annotating," "Indexing," "Vocabulary Development and Maintenance" (Part 1, descriptors; Part 2, Identifiers), "Database Changes" (post-publication). There are two appendixes: "ERIC Clearinghouse Scope of Interest Guide"; glossary of terms. This manual will be of interest to all organizations that use the ERIC database. A detailed index facilitates its use.

Library Research Manual: The Health Sciences. By Emily Montez Bryson and Roland Dale, eds. Chicago State Univ., Ill. 1981. 52p. ED 217 853. MF—$0.83; PC—not available from EDRS.

This independent study workbook is intended to acquaint students of the nursing and allied health professions with the use of Douglas Library of the Chicago State University and to introduce a search strategy for gathering information for research papers. Consisting of nine instructional chapters, the workbook provides information on the card catalog, the Library of Congress classification system, how to find books, encyclopedias, biographical sources, periodical indexes, and the serials holdings list, news indexes, government documents, and quick-answer sources. A concluding chapter discusses term-paper research strategy, and nine multiple-choice answer assignments are attached.

Use of Scientific and Technical Information in Brazil. By Victor Rosenberg and Murilo B. Cunha. Univ. of Michigan, Ann Arbor. School of Library Science. 1981. 234p. ED 219 072. MF—$0.83; PC—$15.32.

This study was conducted to assess the availability and use of scientific and technical information in Brazil, identify characteristics of information which are unique to developing nations, and help determine what technologies and policies would be most useful in improving resources available in the country. It concentrated on professionals who have direct or indirect access to automated bibliographic systems to examine the impact of computer technology. Information was gathered through structured personal interviews on specific concepts related either to broad issues needed to formulate effective policies or to factors affecting policy, e.g., language, knowledge of libraries and information services, evaluation of information services, economics, sharing policy, optimism, cosmopolitanism, influence, dependence, and confidence in library services. The report includes a literature review, a discussion of the interview methodology, a presentation of results, and a general discussion of the findings. An appendix contains the study interview format and coding in English and Portuguese, including fifty-eight questions for the individual interviewed and twenty-one questions for the interviewer on the subject of availability of information for scientific work in Brazil. A bibliography lists more than 250 references.

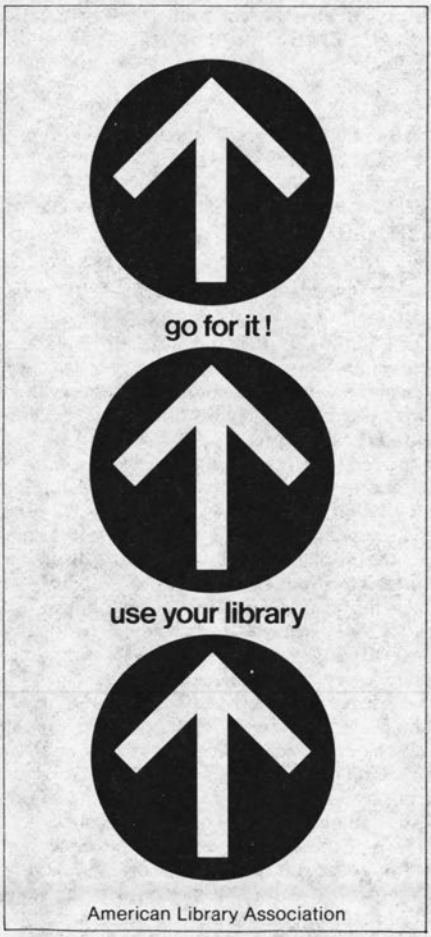
Collection Assessment Manual. By Blaine H. Hall. Brigham Young Univ., Provo, Utah. Library. 1981. 171p. ED 217 852. MF—$0.83; PC—not available from EDRS.

This manual is designed to help bibliographers, librarians, and other materials selectors plan and conduct systematic collection evaluations suing both collection-centered and client-centered techniques. Topics covered in five chapters are: (1) planning the assessment; (2) collection-centered techniques, comprising the compilation of statistics, checking lists, catalogs, and bibliographies, direct observation, and the application of standards; (3) client-centered techniques, including availability and accessibility, user surveys, and periodical use study; (4) specialized assessments, consisting of weeding decisions and approval programs; and (5) reporting assessment results, which includes three examples. Advantages and disadvantages are discussed for each technique as well as step-by-step procedures for its application. Interspersed in the manual are various forms and surveys, e.g., those specific to English, chemistry, and Latin American collections. Appendixes include a list of agencies accrediting academic programs at Brigham Young University, American Library Association standards for university libraries, statistical aids,

and selected sources on collection assessments. Six references are provided.

Signs and Guides: Wayfinding Alternatives for the EMS Library. By Johanna H. Johnson. 1981. 152p. ED 217 840. MF—$0.83; PC—$10.82.

Concerned with increasing the accessibility of the collection of the Engineering/Math Sciences (EMS) Library at the University of California at Los Angeles through the use of self-guidance systems, this practical study focused on the problem context, general library guides, and library signage in reviewing the literature, and conducted a survey of library users to identify orientation problems. Discussion of general library guides covers the advantages and disadvantages of such guides, costs, design and format, organization, contents, and distribution. Signage is discussed in terms of existing problems in locating materials, the overall plan of a sign system, signage hierarchy, communication, and typography and layout, and recommendations are included for a modifiable system. The development of the survey questionnaire and its administration are described in detail, and recommendations based on responses to the questionnaire are provided. Additional materials on the survey are provided in the first appendix, including copies of the pretest and the questionnaire, as well as raw data. The second appendix contains a library guide evaluation sheet, the old EMS guide, and a first, rough draft for a new EMS guide. Definitions, a thirty-seven-item bibliography, and sixty references are included.



Iowa Statewide Disaster Recovery Plan. By Barry L. Porter, ed. Iowa State Library Commission, Des Moines. 1981. 21p. ED 217 834. MF—$0.83; PC—$1.82.

The purpose in developing a statewide disaster recovery plan for libraries is to encourage librarians at the local level to develop their own plans to be used in time of disaster and to provide information about resources that can be used in an emergency. This manual provides self-assessment forms for identifying staff members and sources of off-site services, equipment, and supplies to be contacted in the event of a disaster; an upkeep checklist; a form to establish priorities for salvage of materials; a questionnaire to assess types of fire and insurance coverage needed by libraries, including the library building, internal features, library operations, physical and financial protective measures, and loss experience; a listing of individual members of a disaster recovery team and their areas of expertise; and sources of equipment such as refrigerator trucks and freeze-drying services. A brief bibliography lists references on disaster prevention, fire protection, and procedures for saving water-damaged materials.

Guidelines on Studies of Information Users (Pilot Version). By Geoffrey Ford and Colin Harris, eds. Sheffield Univ. (England). Centre for Research on User Studies. 1981. 68p. ED 217 832. MF—$0.83; PC—not available from EDRS.

Preliminary guidelines are presented to provide a methodology for conducting user studies in the information field, particularly in developing countries. Topics covered include: user

needs in planning a national information system; the identification of user groups; the design and organization of user studies, including background research survey objectives, resources, survey organization, selection of data collection methods, and sampling and response rate; data collection methods including documentary sources, diaries, questioning, and observation; evaluation of data on information needs; and the nature and content of survey reports. Ten figures, thirty-five references, and an eleven-item bibliography are provided. Appended are eleven sample questionnaires, designed for such audiences as the staff of educational institutions, library users, and small and large firms or establishments.

OTHER PUBLICATIONS OF INTEREST

Bibliography of Loyalist Source Material in the United States, Canada, and Great Britain. Ed. by Gregory Palmer. Westport, Conn.: Meckler Books, 1982. 1,064p. $115. LC 80-19682. ISBN 0-930466-26-8.

Cooperative Services: A Guide to Policies and Procedures in Library Systems. Ed. by Helen A. Knievel. New York: Neal-Schuman, 1982. 275p. $24.95. LC 81-22406. ISBN 0-918212-56-1.

Educational Software Directory: A Subject Guide to Microcomputer Software. Comp. by Marilyn J. Chartrand and Constance D. Williams for Corporate Monitor. Littleton, Colo.: Libraries Unlimited, 1982. 292p. $22.50 U.S./ $27 elsewhere, paper. LC 82-20400. ISBN 0-87287-352-8.

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Fishburn, Katherine. *Women in Popular Culture: A Reference Guide.* Westport, Conn.: Greenwood, 1982. 267p. $29.95. LC 81-13421. ISSN 0193-6859. ISBN 0-313-22152-9.

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Inventory of Data Sources in Science and Technology: A Preliminary Survey. Comp. by CODATA, Committee on Data for Science and Technology of the International Council of Scientific Unions. Paris: Unesco, 1982. 229p. ISBN 92-3-102048-X.

Library Education across the Boundaries of Cultures: A Festschrift. Ed. by Anis Khurshid. Karachi, Pakistan: Department of Library Science, University of Karachi, 1981. 190p. $12 U.S. Z688 020.7.

Manual on the Use of the Dewey Decimal Classification: Edition 19. Ed. by John P. Comaromi and others. Albany, N.Y.: Forest Press, 1982. 551p. LC 82-1516. ISBN 0-910608-32-6.

McFeely, Mary Drake. *Women's Work in Britain and America from the Nineties to World War I: An Annotated Bibliography.* Boston: G. K. Hall, 1982. 140p. $24.95. LC 82-9281. ISBN 0-8161-8504-2.

Microéditions de la Biblothèque: Catalogue 1982. By Richard Thouin. Montréal: Bibliothèque Nationale du Québec, 1982. 190p. ISSN 0707-848X.

Public Works History in the United States: A Guide to the Literature. Ed. by Suellen M. Hoy and Michael C. Robinson. Nashville, Tenn.: American Association for State and Local History, 1982. 512p. $49 cloth/$39 to members of the American Public Works Association and the Public Works Historical Society/ $36.75 to members of AASLH. LC 81-19114. ISBN 0-910050-63-5.

Women's Periodicals and Newspapers from the 18th Century to 1981. Ed. by James P. Danky. Boston: G. K. Hall, 1982. 376p. $38. LC 82-11903. ISBN 0-8161-8107-1.

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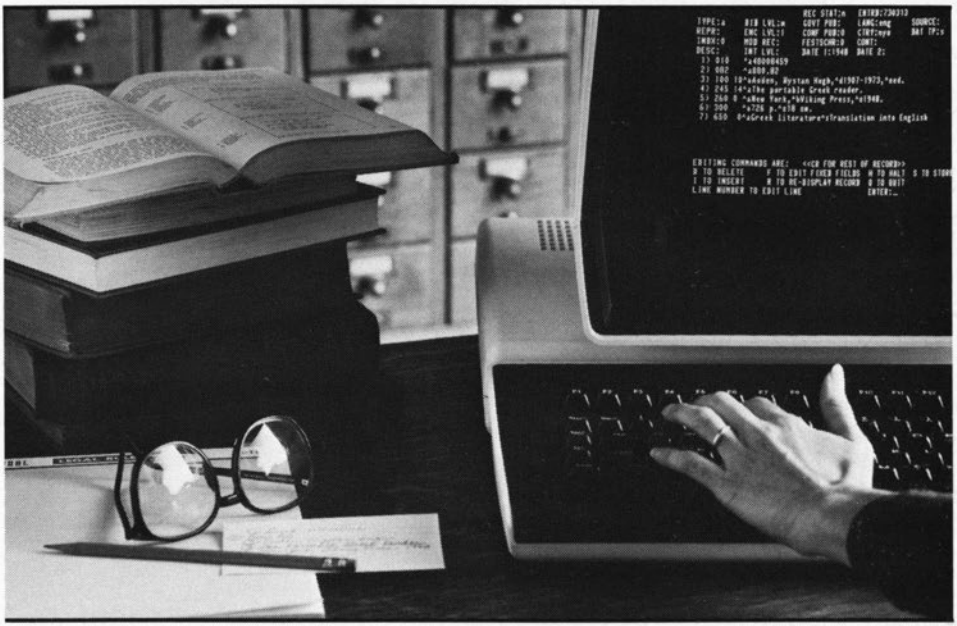

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