

**Report to the
Andrew W. Mellon Foundation**

**Library Buildings and the
Building of a Collaborative Research Collection
for the Tri-Colleges**

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Executive Summary

The planning grant, entitled “Library Buildings and the Building of a Collaborative Research Collection at the Tri-Colleges,” was designed to address the intersection of two central issues: collection space constraints and collaborative collection development. The Planning Group assigned to the project worked with a consultant and, together, they gathered extensive data on the collections, ran focus groups of faculty and students, and engaged three publishing industry experts to assess the state of electronic publishing. Based upon the data collected, the Planning Group studied alternatives for maximizing collection space and made recommendations for new models and strategies to be pursued by the Tri-Colleges.

Key Findings

- Approximately 75% of the collections have circulated one or fewer times in the past 10 years.
- About 40% of the items in the collections overlap, that is they are held on more than one campus; about 20% of those items have not circulated in the past 10 years.
- Students and faculty take significant advantage of the shared collections. Nearly one-third of the loans to Haverford patrons are for materials at Swarthmore or Bryn Mawr. The numbers are similar for Bryn Mawr patrons and slightly lower for Swarthmore patrons.
- The potential for space savings from use of electronic materials is greatest in the sciences because those users have eagerly embraced digital formats and are willing to allow the libraries to deaccession print journal runs that are available online.
- The potential of digitalization has yet to be realized in the humanities which tends to be monograph dependent, since the e-book industry is immature and lacks economic and technological models necessary for large-scale adoption.
- Students and faculty place a high value on shelf browsing both as a means of information discovery and as a means for evaluating and selecting materials.
- Faculty value local ownership of materials and are concerned about weeding which would affect the quality of the collections and students’ ability to do research.
- Swarthmore’s space crisis is most severe, with less than two years of growth space, but Bryn Mawr may lose most of its growth potential in order to accommodate new services and needs. Haverford has about five years of growth.

Conclusions

The result of the study makes us cautiously optimistic that we may be able to gain sufficient space savings through de-duplication and weeding of zero-use materials to extend our current shelving capacity until the promise of digital formats can be more fully realized. Since use rates of older materials diminish significantly over time, the libraries could add shelving capacity through a judicious regular weeding program without affecting student and faculty research. Furthermore, cooperative collection weeding will provide an opportunity for the bibliographers/subject specialists to work together to realign their current buying practices to limit duplication and redirect dollars, thereby enhancing the scope and depth of the collections. Ultimately we think that the libraries and colleges will benefit greatly from a more unified approach to collection development that offers the greatest potential to take the libraries from three independent undergraduate collections to an integrated research collection.

However, data from the focus groups and a pilot study on weeding duplicate materials indicate that faculty have serious concerns about moving towards a more integrated collection. The colleges must engage the faculty in discussions about trade-offs if the libraries are to continue to maintain the current collection practices and duplication rates. Nevertheless, the libraries should note that any weeding project will need to be done in tandem with the faculty, or the libraries risk the loss of credibility and support from their constituents.

Even if the faculty are supportive of moving toward an integrated collection, weeding will not solve all of the libraries' space needs. Compact shelving, which has been proposed for Swarthmore's McCabe Library and could be added to other libraries in modest amounts, would create significant space gains in shelving. However, the colleges would still need to continue to pursue off-site storage options if no additional space is planned within the next ten years.

I. Overview

The Grant

This report is the product of a planning grant awarded by the Mellon Foundation in 2001 to the Tri-College Library Consortium, a group consisting of the Bryn Mawr, Haverford and Swarthmore College libraries. The grant proposal, entitled “Library Buildings and the Building of a Collaborative Research Collection for the Tri-Colleges,” set out a research agenda designed to address two central questions. The first was a challenge: how would the libraries come to terms with mounting space problems caused by ever growing collections and increasing demands to accommodate media, teaching, and student study areas, all in an environment in which library building expansion was a remote possibility? The second was an opportunity: could the libraries take advantage of their history of cooperation and the powerful tool of a unified online catalog to create a research-quality collection out of the combined holdings of three strong liberal arts colleges? The two questions seemed inextricably linked because many of the potential solutions to the space crises involved the same types of cooperative activities that would be needed to build an integrated collection. By addressing the two issues in a single study, the planning grant allowed us to think about our holdings in a broader, more creative way, and to begin identifying steps that will enable us to solve our space problems while simultaneously building a richer, unified collection capable of supporting a wide range of student and faculty research.

The Environment

At first glance, Bryn Mawr, Haverford and Swarthmore Colleges are similar institutions. They all have between 1,100 and 1,500 students, are known for their strong liberal arts curricula, and are all ranked among the best private liberal arts colleges in the country. They all originated as Quaker colleges, and they lie within a few miles of each other in the Philadelphia suburbs. At the same time, there are real differences among them. Swarthmore was co-educational from its founding in 1864. Haverford, founded in 1833, was all-male until 1980 when it began admitting women. Bryn Mawr was founded as a woman’s college in 1885, and has offered doctoral-level programs since its opening. It remains a woman’s undergraduate institution, but also has over 200 male and female students enrolled in graduate programs. Bryn Mawr and Haverford, located within a mile of each other, have partnered in a wide range of activities since the former’s founding. Swarthmore, situated ten miles south of the other two, has had far fewer connections with them, although the number of academic, social, and library ties have increased in recent years. Students are allowed to take classes freely among the schools, with transportation provided by free shuttle buses and vans.

Since 1991 the college libraries have shared an online catalog, Tripod, which offers a unified catalog to all of the libraries’ 2.3 million volumes and an easy means of ordering a book from another campus, delivered within 24 hours via a Tri-College library delivery service. Members of the library staffs have met regularly over the last decade to oversee the operation of Tripod, and those contacts have expanded in recent years as the libraries found it worthwhile to cooperate on purchasing electronic resources and setting up electronic reserve programs. Consortium activities have increased dramatically in the last

few years, spurred by the appointment of new library directors at each school. In the last two years the libraries have collaborated on cataloging web sites, creating Tri-College electronic subject guides, and initiating a pilot digital collections program.

Organization of the Project

The Planning Group for the study consisted of staff from all three libraries, plus a member of the Tri-Colleges Consortium staff and an outside consultant who coordinated the work. The members of the Group were:

Linda Bills, Tri-Colleges Consortium Special Projects Librarian
 Norm Medeiros, Coordinator, Bibliographic & Digital Services, Haverford College
 Amy McColl, Assistant Head of Technical Services, Swarthmore College
 Amy Morrison, Associate College Librarian, Swarthmore College
 Eric Pumroy, Associate Director for Collection Development, Bryn Mawr College
 Peggy Seiden, College Librarian, Swarthmore College

Judy Luther, President of Informed Strategies, was hired as the outside consultant to organize the work of the project and compile the results.

The work of the planning grant was divided into five major components: assessing the collections, analyzing trends in electronic publishing, talking with students and faculty about library use, examining options for gaining collection space, and exploring models for organizing the work of collection development and management in a highly collaborative environment. This report is organized according to those components. The key findings for each section are summarized below.

Results and Findings

1. Collection Assessment

A significant portion of the planning grant's work was devoted to analyzing data gathered from Tripod in an effort to understand the strengths and weaknesses of the Tri-College's collections, the rate and pattern of collection growth, and how students and faculty use the collections. While further analysis of the data is called for, several trends seemed very clear.

Use of the collection. Three-quarters of the collection rarely circulates: 57% of the volumes have not been charged out in the last ten years, and an additional 17% have been charged out only once. Nearly a third of the collection was published prior to 1950, and these older books circulate at a significantly lower rate than recent ones. Furthermore, there is a substantial rate of duplication among the collections at the three libraries. Approximately 40% of the titles are held by more than one library, and of these, half have not circulated in the last ten years. These high levels of duplication and non-circulating books suggest that weeding of the collections, particularly the weeding of little-used duplicates, can be done without reducing the ability of the libraries to meet the needs of students and faculty. Since the libraries are all facing space crises in the next few years, reducing the size of the collections can extend the useful lives of their current buildings.

Duplication in new acquisitions. The libraries are continuing to duplicate new purchases at a high rate. Approximately 80% of the books Swarthmore acquired through its approval plan were also purchased by the joint Bryn Mawr/Haverford plan. If the libraries can reduce the level of duplication in their current buying, they can free up substantial acquisition funds to spend on expanding the breadth of the Tri-College collection.

Cross-campus borrowing. Most student and faculty borrowing is done from their own college libraries. At the same time, cross-campus borrowing represents a significant portion of the total: 31% at Bryn Mawr, 37% at Haverford, and 20% at Swarthmore (2001 figures). These borrowing patterns underscore the importance of a strong core collection at each library, but also suggest that students and faculty have become accustomed to drawing on the collections of the other two libraries.

2. Trends in Electronic Publishing

Electronic publications have been absorbing ever larger percentages of library acquisition funds in recent years. One of the important issues for the planning project was to determine whether electronic publishing is also likely to change the rate of growth in the libraries' physical collections, and thereby reduce the need for additional collection space in the future. To help with this analysis, the Project Group retained industry consultants to assess both the current availability of electronic books and journals, and the prospects for future expansion of electronic publishing. These were the major findings:

E-Books. Electronic books are not yet a viable substitute for regular books because of copyright issues, the lack of a proven economic model, and the absence of a comfortable reading system. Nonetheless, e-books have considerable value as reference books, for reserve readings, and to serve as browsing copies. In a consortial environment, e-books are especially valuable since they assure equal access to everyone in the system, including people working from offices, dorm rooms, and off-campus.

Print-on-Demand. Publishers are beginning to move toward a print-on-demand system for book distribution, which holds the promise that books will rarely go out-of-print. If this system comes into place as expected, libraries may have more freedom to avoid buying duplicates and peripheral materials since they will have fewer worries about books quickly becoming unavailable.

E-Journals. Electronic journals are becoming increasingly common, particularly in the sciences, and most major publishers have programs in place to convert back runs of their titles to electronic form. Whether libraries will be able to discard print copies once the electronic versions are available depends upon the reliability of the provider and the completeness of the content. In cases where confidence in the provider is very high, such as the non-profit JSTOR, the libraries have the potential to realize significant space savings by eliminating duplicate sets. The Tri-College libraries do not have the same archival role that research libraries have, and so have some freedom to be more aggressive in converting print journals to electronic, knowing that print copies will still be available from other libraries should they be needed.

3. Understanding Student and Faculty Use

The Planning Group conducted focus groups on each campus to get a clearer understanding of how faculty and students use the collections and to get their reactions to some of the options being considered. The most strongly voiced concerns were as follows:

Browsing. Faculty and students place a high value on being able to browse the shelves, and do not see current online browsing capabilities as a satisfactory substitute. Faculty use browsing not just for identifying books to read, but also for locating references and background information. If the libraries are going to reduce the amount of overlap among the collections, Tripod's browsing capabilities will have to be significantly enhanced, and the number of texts available in electronic form substantially increased. They will also need to develop ways of measuring the in-library use of their collections to gain a clearer view of the materials being consulted.

Locally-needed materials. Students and faculty agreed that print materials used in course work are time sensitive and need to be housed on the campus where the course is being taught. As the libraries consider the issue of duplication, they will need to find ways of distinguishing between books needed locally for immediate class support and those materials needed for student and faculty research, but which can be housed anywhere in the system.

Electronic resources. Electronic information sources are heavily used and appreciated, and in some disciplines they are changing the way research is done. The greatest changes are being seen in the sciences due to the nature of the research process and the widespread availability of electronic resources. Fewer changes have been seen in the humanities, where scholars continue to depend heavily on print materials. These variations in use patterns among the disciplines argue for the libraries to take a discipline-by-discipline approach when considering changes in the patterns of acquisitions.

New types of spaces. Both faculty and students supported the creation of new spaces in the library, particularly comfortable informal spaces, group study areas, and places for using media.

Faculty involvement. Faculty expressed concerns about the effects of moving to an integrated Tri-College collection. Local ownership of books and journals in a faculty member's discipline is an important indication of a good academic library; accessibility through a consortium is not the same. Furthermore, faculty were concerned that weeding the collections will harm their students' work as well as their own. Clearly, any changes in the way the collections are managed will require that the libraries work closely with the faculty so that the libraries make the right collection decisions and the faculty understand the trade-offs.

4. Space Planning Options

All three college libraries are facing space crises in the near future as a result of growing collections and increasing demands for new types of library spaces. With few prospects for expanding any of the library buildings, the Planning Group examined ways of making the existing space last longer, since even an additional five years might be enough to see more clearly the impact of electronic publishing on library space needs. In the decision-making discussion it will be imperative that all constituents be apprised of the costs, trade-offs, and opportunities associated with these options. The most promising options are these:

De-accessioning. Several years' worth of growth may be gained by weeding duplicate copies of materials that have not circulated in the last eleven years. To realize more significant space gains the libraries will need to 1) expand the scope of materials considered for weeding, and 2) implement a routine weeding program in all libraries. Given the age of the collection and the low level of use of the older materials, such an expansion seems possible. As much promise as weeding holds for recovering space, it also carries the risk of compromising the collections if it is not done carefully and in consultation with faculty.

Compact shelving. All of the colleges are currently using compact shelving in at least one of their libraries, and Swarthmore has plans to install units in McCabe Library that will gain ten years of expansion space. The potential gains to be made from compact shelving are limited, though, since most of the libraries do not have floors that can support the additional weight. It is also only desirable for low-use collections, since only a small part of the collection is accessible at any one time.

Off-site storage. A number of research institutions have created special storage facilities off-campus to house low-use books. Off-site storage has the advantage of keeping books in the system and making them available within 24 hours, the same response time promised by the rest of the Tri-College system. The disadvantage is the significant cost of building and maintaining the facility. Swarthmore and Bryn Mawr are currently looking into a proposed cooperative collection storage facility for Philadelphia-area cultural institutions.

Electronic resources. The libraries are already seeing a slowing of the rate of growth in the journals collections due to the conversion of journals from paper to electronic, an estimated 360 linear feet per year. The space savings should continue to grow in the sciences and, at a slower rate, in the social sciences and humanities. Other significant space savings are being realized in reference and government documents. Space savings through purchase of electronic books is probably at least five years away.

5. Exploring New Models

As the Tri-College Libraries work together to address their common space problems, they also have the opportunity to move beyond the current model of three separate liberal arts college collections, and towards the creation of an integrated research collection, one capable of supporting a much broader range of our students' and faculties' work than is currently possible. The building of an integrated collection will require that they expand

the new decision-making structures and communication tools that they have put in place during the last few years. As the collaborative work becomes more extensive and complex, the libraries will have to continue to find new approaches to doing their work, both to make their work more efficient, and to make the libraries more functional for the students and faculty. The Planning Group identified the following areas as being the most important:

Organization of collection development. Each of the libraries organizes its collection development activities in different ways, resulting in different approaches to collections and different methods of decision-making. In order to operate effectively in a collaborative environment, the libraries will need to look at adopting other models for organizing their work, including the model of the research university subject specialist.

Tri-College approval plan. Reducing the amount of duplication in new acquisitions has the potential to free funds to spend on materials not currently being acquired. Since a major portion of the libraries' book budgets are spent through approval plans, finding a way of coordinating these plans is critical.

De-accessioning projects. Large-scale, coordinated weeding projects appear to be an essential part of any long-term strategies for recovering library space. Undertaking such projects without weakening the overall quality of the collections will require careful communication among librarians and faculty, and, at least for a time, a central project staff to manage the process.

Catalog enhancement. The greatest faculty and student concern about the move to an integrated collection is the loss of the ability to browse the shelves. The libraries will need to find methods of making the shelf browsing function in Tripod more useable, and of enriching the cataloging records so that virtual browsing is an acceptable substitute.

II. Collection Assessment

A significant portion of the planning grant focused on understanding the development and use of the Tri-Colleges' collections and their impact on the growth and consequent space planning needs of the three libraries both individually and as a consortium.

Data Gathering Process

A Statistics Task Force was designated to gather data on the collections: their size, strength, duplication, growth rate and use. The members of the Task Force were Scott Silverman, Norm Medeiros, Barbara Weir and Linda Bills.

As a preliminary step, the colleges worked with Electronic Scriptorium to identify and merge remaining duplicate bibliographic records in the database. This process eliminated about 60,000 duplicates that had survived the original record merger done in 1990. Additional database massaging was to done to facilitate the creation of call number-based reports.

The Task Force consulted bibliographers and determined that statistics should be gathered for 215 subject areas.¹ The goal was to get as much information as possible to cover four areas of inquiry:

- Collection size, growth and duplication (quantity)
- Collection strength (quality)
- Collection use
- Patron needs

The following statistics were accordingly gathered. Unless otherwise stated, statistics came from report functions in the Tri-College Consortium's shared online catalog ("Tripod"). Because Tripod was fully implemented in 1991, all such statistics date from that time.

Collection Size, Growth and Duplication.

Size in monographic titles and volumes and annual growth from 1991 to the present.

Monographic title and volume overlap among (not within) the libraries

Collection Strength²

Number of foreign language titles

¹ Only LC and Dewey print monographs were examined. Special collections and government documents were specifically excluded.

² Collection strength proved the most difficult measure to obtain. Subjective expert evaluation was not possible. At the time of the study, the OCLC Automated Collection Analysis Service (ACAS) reports were not affordable. With the recent reduction in ACAS prices, the Colleges hope to revisit this option, as well as exploring other methods for comparison with peer collections.

Collection age by publication year
Interlibrary loan lending activity

Collection Use

Number of circulation transactions
Circulation rates (e.g., number of volumes with 0, 1, 2-5 or 6+ circulations)
Circulation rates to faculty
Circulation rates to non-Tri-College libraries (ILL loans)
Circulation distribution to faculty and students based on department/major.
Cross-library borrowing within the Tri-Colleges

Patron Needs (non-Tripod)

Analysis of courses offered in the last 4 semesters
Borrowing from outside of the three colleges (ILL borrows)

Statistics collected were prepared for the bibliographers in a FileMaker program created by Linda Bills. The program is organized by subject area to display both summary and detailed data for each of the criteria above. It also produces comparative reports specific to each type of data for easy comparison across subject areas. The comparative reports are intended to help bibliographers see patterns of growth and use, and quickly spot exceptional cases. Breakdowns are available for the whole Tri-College Consortium and by library. Examples of the reports are attached as an appendix.

As the recommendations of this study are implemented, feedback from the subject specialists will aid in determining which data is useful, what additional data is needed, and how it should be presented. The aim is to develop an ongoing data collection and analysis tool.

Data Gathering Results

The results reported here reflect the broadest perspective on the data. The three discipline divisions shown here cover roughly the following LC classes: humanities A-BD, BH-DU, E-F, M-PZ, TR, Y-Z; social sciences BF, DX, G-GC, GN-LG; science GE, Q-TP, TS-TX, U-V.

Collection Size and Growth

Discipline size and growth patterns reflect the stable distribution of monographs in the disciplines with the preponderance of books in the humanities. Thirty percent of titles and 32% of volumes currently in the collections were added in the last 10 years.

Subject Distribution of the Tri-College Collections								
	1991 # Titles	%	1991 # Vols	%	2001 # Titles	%	2001 # Vols	%
Humanities	494,071	67%	714,620	69%	628,492	66%	928,329	67%
Social Science	153,973	21%	210,984	20%	213,606	22%	295,601	21%
Science	90,367	12%	114,819	11%	116,390	12%	153,822	12%
Total	738,411	100%	1,040,423	100%	958,488	100%	1,377,752	100%
% Purchased 1991-2001					30%		32%	

Collection Overlap

“Collection overlap” refers to the total of all titles and volumes which are held in more than one library. In our terms, this is not the same as “duplication” which we consider to be the copies of the title beyond the first one; that is, copies that we could remove without reducing the intellectual content of the whole.

Monographic overlap rates were tracked both by the number of titles held in more than one library, and the number of volumes represented by that overlap. Volumes are more than twice the number of titles, reflecting not only multi-volume sets but also instances of “triplication”. Rates are measured against the total collection. The data suggest that the introduction of the shared catalog in 1991 led to reduced duplication in all disciplines.

Monograph Overlap Rates of the Tri-College Collections								
	Pre-1991 Titles	Rate	Post-1990 Titles	Rate	Total Titles	Rate	Overlapped Titles	Rate
Humanities	129,258	26%	28,639	21%	157,897	25%	361,122	39%
Social Science	56,637	37%	15,591	26%	72,228	34%	142,253	48%
Science	19,053	21%	3,153	12%	22,206	19%	44,715	29%
Total	204,948	28%	47,383	22%	252,331	26%	548,090	40%

Serial subscription overlap rates vary by library. There are 7,259 current print serial subscriptions³ on the three campuses. These represent 5,216 separate titles, and 2,026 second or third subscriptions, with 530 titles subscribed to on all three campuses.

Overlap Rates of Print Serial Subscriptions					
	Total Subscriptions	Unique Subscriptions	Overlap Subscriptions	Rate	Duplicate Subscriptions
Bryn Mawr	2,891	1,710	1,181	41%	
Haverford	1,699	654	1,045	62%	
Swarthmore	2,669	1,333	1,336	50%	
Tri-College	7,259		3,562	49%	2,026

Electronic serials have a high overlap with print journals. Purchasing decisions for electronic journals and journal collections have been made primarily to provide access to titles known to be used in print. Collectively, the Tri-College libraries have 5,216 print journal titles and 2,200 e-journal subscriptions, not including full text coverage in aggregator databases like Lexis-Nexis. As a by-product of these purchases, the total list of journal titles available in either print or electronic form has increased by 10%, or 500 titles. As a result of Tri-College purchases, 73% of the e-journals are available in all three schools, compared to 50% of print journals.

The growth of electronic resources in the colleges is illustrated by the following chart.

³ “Serials” includes print periodicals, annuals, monographic serials and continuations. Excluded are government documents, online and microfilm subscriptions.

Growth of Electronic Resources												
Year	E-Journals			EJ Coll			Databases			DB w FT		
	BMC	HC	SC	BMC	HC	SC	BMC	HC	SC	BMC	HC	SC
1991	0	1	3	0	0	0	0	5	0	0	0	0
1996	11	6	11	1	0	2	21	8	11	0	0	1
2001	40	26	30	10	10	10	63	33	50	11	8	11

E-Journals = single title purchases; EJ Coll = Collections of e-journals such as JSTOR, Ideal; Databases = A&I or similar resources; DB w FT = A&I databases with some full text such as Lexis-Nexis or Expanded Academic.

Collection Age

When the circulating monographic collection is examined more closely, books published prior to 1950 comprise nearly 1/3 (32%), while almost half (45%) were published between 1950-1990 and the remainder (20%) were published since 1990.

Age of the Collection		
Pub Date	Titles	Percent
Pre-1950	326,433	31.56%
1950-1969	178,783	17.29%
1970-1989	291,797	28.21%
1990-	200,810	19.42%
No Date	36,391	3.52%

Interlibrary Lending and Borrowing Activity

ILL loan activity may be an indirect measure of collection strength. There are almost twice as many items loaned as borrowed by the Tri-Colleges; further data gathering on ILL loans could indicate the value placed on specific parts of the collections by the broader research community. A snapshot of ILL lending patterns showed that the Tri-Colleges were lending 50% humanities, 40% social sciences, and 10% sciences.

Circulation

In examining usage within the Consortium, it became apparent that over half (57%) of the total 1.39 million circulating volumes had not circulated since Tripod was implemented in 1991. Approximately 175,000 of these volumes with no circulations are duplicates (held by more than one library).

Circulation Levels since 1991		
	# Vols	Percent
0 circs	723,063	57.41%
1 circ	220,491	17.51%
2-5 circs	241,054	19.14%
6+ circs	74,899	5.95%

A further examination of circulation levels for duplicated items shows that the percentage with zero circulations is slightly lower than for the whole, indicating that some of the duplication is warranted by higher usage. However, it is still clear that over half the duplicated volumes have little or no current use.

Circulation of Overlap Items since 1991		
	# Vols	Percent
0 circs	272,877	50.58%
1 circ	101,317	18.78%
2-5 circs	122,350	22.68%
6+ circs	42,944	7.96%

An analysis by publication date at the Tri-College level for all disciplines shows a direct correlation between the level of circulation and the age of an item.

Circulation by Publication Date since 1991			
Pub Date	Total Vols	# Vols / 0 Circ	% 0 Circs
Pre-1950	380,724	306,962	80.63%
1950-1969	256,927	168,310	65.51%
1970-1989	379,594	174,264	45.91%
1990-	242,262	73,527	30.35%

Cross-Library Borrowing

The rate of cross-library borrowing within the Tri-Colleges has been tracked since the introduction of the shared online system. The table below indicates that, after an initial jump, cross-campus borrowing leveled off for many years and has recently begun to rise again. The higher levels for Bryn Mawr and Haverford are largely due to the higher number of Bi-College programs and the Bi-College approval plan.

Cross-Campus Borrowing by Patrons Percent of Borrowing from Non-Home Campuses								
Patron's Campus	Pre-Tripod	1995	1996	1997	1998	1999	2000	2001
Bryn Mawr	23%	32%	30%	30%	32%	32%	29%	31%
Haverford	26%	28%	25%	25%	30%	30%	29%	37%
Swarthmore	7%	12%	11%	17%	15%	19%	19%	20%

More detailed analysis of cross-library borrowing by faculty departments and student majors was also initiated. In the process data tracking inconsistencies were discovered which, although they have since been corrected, meant that faculty data could not be gathered retrospectively. Student data was available; the two tables below show the type of information obtained.

Cross-Campus Borrowing Rates – History Majors Jan. 1999 – Dec. 2001			
Source	BMC Students	HC Students	SC Students
<i>Bryn Mawr</i>	60%	24%	13%
<i>Haverford</i>	26%	63%	12%
<i>Swarthmore</i>	14%	13%	75%

Cross-Campus Borrowing Rates – Math Majors Jan. 1999 – Dec. 2001			
Source	BMC Students	HC Students	SC Students
<i>Bryn Mawr</i>	78%	23%	3%
<i>Haverford</i>	14%	67%	3%
<i>Swarthmore</i>	9%	10%	94%

Patron Needs Based on Curriculum

The Planning Group created a system to categorize the colleges' courses and enrollments into the same subject divisions applied to the collections and to rate courses in terms of how dependent they are on library resources. Although the measures of need obtained seem to be useful, assigning the subjects has proved difficult and time-consuming, and has not yet been completed. Further work is needed to determine whether this measure can be efficiently applied to patron need analysis.

Borrowing From Beyond the Tri-Colleges

Another potential measure of unmet patron need would be interlibrary borrowing activity from outside the three colleges. Unfortunately, although we have rough numbers of requests, subject classification information is not available for PALCI (Pennsylvania Library Consortium Initiative) and difficult to compile from OCLC requests.

The interlibrary borrowing patterns of the three schools reveal an emphasis on books (60% books to 40% journals). Half of the books borrowed came from PALCI, a state-wide system with patron-initiated borrowing and fast response time. Currently PALCI handles only monographs; its introduction has increased the interlibrary activity for books. Nearly half (47%) of interlibrary borrowing from outside the Tri-Colleges was done by undergraduates.

Key Findings

- Approximately 40% of the circulating titles in the three college libraries are duplicated in another library.
- 57% of the circulating volumes have not circulated in the last 10 years; an additional 17% have circulated only once. Older materials circulate less than more recent materials. 50% of duplicated titles have had no circulation in 10 years.

- Overlap in the current approval plans between Swarthmore and the Bryn Mawr/Haverford shared plan is 80%. Overlap within the Bi-College plan itself is 15%.
- Patrons are comfortable borrowing materials from the other libraries. Cross-library borrowing rates appear to be steady or rising.
- Humanities materials account for 67% of the monographic collection. Social science materials account for 21% and have the highest duplication rate. Science materials account for only 12% and have the lowest duplication rate.

Discussion of Data Collection Issues

Data collection accuracy and usefulness could be improved in several ways, a few of which are not under the Tri-Colleges' direct control.

- An ongoing data collection system should be instituted, particularly for “snapshot” statistics which are not available in the historical system reports.
- The current 215 subject categories should be updated by the bibliographers to bring them in line with collection concerns.
- Rolling inventories are now done at Swarthmore and Haverford; the Bryn Mawr collection was last inventoried in 1990. Coordinating inventory schedules with collection evaluation schedules would be valuable.
- Each library has a different program to capture in-library and non-circulating use. In-library use in particular is of concern to the faculty, making better measurements desirable. Likewise reserve use could not be effectively counted in the statistics programs.
- A few collections have their circulation restricted to their own campus; use statistics for these materials will not be a true reflection of demand.
- Interlibrary loans from outside the Tri-Colleges could be more closely analyzed if more data were available, especially from PALCI.
- A better way needs to be devised to analyze more quickly and accurately patron needs as reflected in courses and enrollment.

III. Trends in Electronic Publishing

The economics of publishing on the Web is prompting a shift from ownership of a local print copy to access to a remote electronic copy. It is more efficient for publishers or vendors to host content on the web in a location that users can access from anywhere at anytime than to sustain the print model where materials are printed, distributed, bound, and retained in every local site that might need them. This is prompting libraries to question the need to retain print copies locally when material is reliably available online.

In order to assess the impact of electronic publishing on acquisitions and weeding, the Planning Group retained industry consultants to conduct research on the availability of current and previously published books and journals in electronic form. In the fall of 2001, Rick Lugg of R2 Consulting Services addressed e-book issues, and October Ivins and Marilyn Geller addressed e-journal issues. The results of their research are incorporated in this section. The Planning Group then considered the e-publishing landscape to evaluate its potential impact on Tri-College collections and space.

Trends in E-Books

The total U.S. output of paper and hardback books, according to the 2001 *Bowker Annual*, was slightly less than 100,000 in 2000, down from 120,000 in 1998. The average number of academic print titles handled on approval plans for 2000-2001 according to Blackwells and Yankee Book Peddler ranged between 40,000-50,000. *Books-in-Print* estimates that the total number of e-books, regardless of year issued, is about 40,000.

Although e-books have not yet enjoyed commercial success, 80-100% of academic publishers are converting their titles into PDF, XML and OEB standards that provide them with greater options for electronic distribution and print-on-demand. Rick Lugg estimates that by 2004 most academic publishers will have their new titles in format-neutral repositories, making possible print-on-demand or electronic publishing.

E-books are currently available from three sources: intermediaries that serve as a distribution channel, publishers hosting the content themselves, and libraries initiating projects sometimes in conjunction with publishers.

Intermediaries present the works of many publishers and are the most visible source of book content in electronic form. Although netLibrary and Questia had 25,000 and 40,000 volumes respectively of predominantly older titles, neither had a sustainable economic model. Ebrary accepts books only in the PDF format which is frequently a stage in the production process. This strategy has allowed them to secure newer content and they have approximately 20,000 titles. The most successful intermediaries at this point have a discipline focus: Knovel (engineering reference works), Ovid (nursing titles), Xrefer (linked reference works), and Books 24x7 (technology titles).

Publishers such as Gale, MacMillan, Wiley, and Oxford University Press are offering small well-respected collections in electronic form. The Mellon Foundation has been

actively funding the exploration of various approaches. Two of these include Bibliovault at the University of Chicago which is offering over 5,000 titles from 20 university presses available on demand (<http://www.bibliovault.org/>) and the History E-Book Project with the American Council of Learned Societies (ACLS) which is working to convert over 500 backlist titles of significance in history and to publish 85 new electronic titles. (<http://www.historyebook.org/intro.html>)

Library-sponsored initiatives include the University of Virginia's successful and popular Electronic Text Center (<http://etext.lib.virginia.edu>) which offers 1,800 public domain titles available in the MS Reader and Palm formats. The CIC (Committee on Institutional Cooperation), comprised of the Big Ten Athletic Conference and the University of Chicago, is developing a cooperative pilot to make their current University Press titles available in PDF format to their member libraries. (<http://www.cic.uiuc.edu/UnivPressRelease12172001.pdf>)

At Carnegie Mellon, Gloriana St. Clair, University Librarian, and Raj Reddy, the Simon Professor of Computer and Robotics, are developing the Universal Library. Their goal is to digitize one million books at sites in India and China. They have completed a pilot of 100 books with funding from the National Science Foundation and they are expecting additional funding to support shipping of books overseas for conversion, selecting books, clearing copyrights, developing a scalable database, and doing related research on text language processing and automatic metadata creation programs. (<http://ul.cs.cmu.edu/>)

University of Pennsylvania has partnered with Oxford and Cambridge University Presses to create History Books Online for research purposes. Funded by the Mellon Foundation, Penn is hosting all OUP and CUP history titles since 1999 to study classroom and research applications and the relationship between print and electronic book use and sales. The Tri-College Consortium is participating in this experiment. (<http://digital.library.upenn.edu/ebooks>)

Print-on-Demand

Publishers use Short Run Digital Printing (SRDP) and standard distribution methods with their major printing partners to deliver smaller orders of books ranging typically from 25 to 300. This allows them to control their inventory costs and extend the life cycle of low demand titles. Most publishers have a PDF version that they can store cost-effectively for both front list and back list titles, printing as needed.

Cost-effective hardware should be available in the next 2 years to deliver on the promise of print-on-demand, enabling a single copy to be produced at point-of-sale. This approach will allow for electronic distribution and local printing. Vendors that store electronic files for publishers and print them as needed include Lightning Source, owned by Ingram, which hosts 100,000 books from 1300 publishers and Informata, owned by Baker and Taylor, which launched its "Ed" delivery system in the spring of 2002.

As print-on-demand becomes more widely available, it will free libraries from acquiring potentially lower-use books when they are initially published. If it is combined with e-

books that can be viewed all or in part, libraries are likely to acquire core materials in print, but access other materials online with the option for quick delivery of a complete print copy.

It is also attractive to consider using electronic versions and print-on-demand to stand in for low-use older materials which are weeded or stored off-site. However, the cost of securing electronic rights for backlist and out-of-print titles, combined with the cost of scanning and converting the content, precludes the rapid conversion of older materials by publishers. The CMU Million Book project will be an important test of whether this approach is feasible.

Trends in E-Journals

The June 2002 issue of *Library Systems Newsletter* documents the level of scholarly journals available in electronic form that are indexed in the Institute for Scientific Information's Citation Indexes. Of the 8,500 total journals included, 75% of the Science, 64% of the Social Science and 34% of the Arts & Humanities journals are available in electronic form. EBSCO's Electronic Journal Service lists 8,000 e-journals and some industry experts put the total closer to 10,000 journals now available in electronic form.

Since library decisions about the location and disposition of journal back files in print are dependent on their availability in electronic form, October Ivins conducted a survey of 15 publishers (6 society, 7 commercial, and 2 university presses) and 4 publisher service providers to determine their plans.

Intermediaries for journals included in the survey are publisher service providers who offer a conversion or hosting service such as Ingenta, BioOne, Highwire, or JSTOR. Aggregators who must rely on a contract with the publisher for their content (ProQuest, EBSCOhost, Gale) are not included in this report due to the variability of their content.

The publisher service providers verified the trend toward converting back files over the next 2-3 years and noted that cost is the limiting factor. JSTOR is focusing on converting the back files of journals, keeping 2-5 years behind current publication to protect publisher subscription income.

Publishers surveyed as societies included: American Chemical Society (ACS), American Institute of Physics (AIP), American Mathematical Society (AMS), Association for Computer Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), and Institute of Physics (IOP). Commercial publishers included: Blackwell Publishing, Elsevier, John Wiley & Sons, Kluwer, Academic, Lawrence Erlbaum, Springer Verlag, and Taylor & Francis. University presses included Oxford University Press and Cambridge University Press.

The society publishers surveyed have over 90% of their 663 journals in both print and electronic form while commercial publishers have only 33% of their 6,688 journals in both print and electronic form. Only 12 society and 39 commercial publishers publish journals exclusively in electronic form. Many publishers are converting their pricing to

electronic with a surcharge for print (rather than print with an electronic surcharge) and offering electronic-only subscription options.

In reviewing back files of content available, ACM has converted almost their entire back file and Elsevier has an aggressive commitment to convert more than 1,440 titles by 2005. Seven other publishers were selecting titles to convert or converting all their titles retrospectively in stages by decades. Their progress is dependent on economic conditions, technological developments and evolving market preferences. Forty percent of the publishers do not have major conversion plans for their back files due to the expense and the concern that libraries may not be willing to pay for back file access.

Use of Electronic Journals

Preliminary results from the University of California's Mellon-funded Collection Management Initiative indicate that although use of print journals is higher when the print is located on-site, digital versions experience 1-2 times the use of print versions in any location.

Retention of Print

Marilyn Geller, who was Project Director of the Mellon Grant for Digital Preservation at Harvard, advised retaining access to print versions once an e-journal back file is made available online until the content of the electronic version is equal to or better than its print counterpart. The publishers surveyed echoed this advice and expressed concerns, based on their own experience, about the lack of standards, inconsistencies in converting content, and future data migration.

Bibliographic Control

Obtaining clear holding and licensing data on e-journal subscriptions is difficult because they frequently are licensed in conjunction with the print or as part of a collection of journals including many titles not previously held by the library. Integrated library systems' modules for dealing with print subscriptions do not yet address control issues for electronic journals and collections. Until such a system is available commercially, the Tri-College Consortium created an Electronic Resources Tracking System (ERTS) in FileMaker to track administrative metadata for electronic subscriptions held by each college. This database could be expanded to include call numbers, the number of bound volumes, title changes, ISSNs and other data pertinent to future projects.

Key Findings

- Print-on-demand is likely to be available from many publishers or distributors within two to three years. If this service is combined with an online preview option, and comes from reliable sources, it could reduce the need for just-in-case purchase of titles peripheral to the curriculum.
- Available collections of current e-books are limited due to a variety of factors, including the lack of a proven economic model.

- Available collections of electronic versions of older books are limited due to both technology and copyright issues.
- E-books currently show the greatest potential for reference works, or quick access to limited sections of a work for research or reserves. The lack of comfortable reading systems discourages their use for any substantial reading.
- Most major journal publishers, both commercial and society, have programs in place to convert back runs of their titles to electronic form. However, it is not yet clear whether content will completely duplicate the print journals in all cases.
- The reliability of the archives of journals remains a major concern in evaluating the retention of print copies.
- Journal publishers currently advise against completely discarding back runs of converted titles and urge retention of or access to print for the near term.

Discussion of Trends in Electronic Publishing

To assess the impact of electronic publishing on space planning, the Planning Group attempted to estimate the amount of space that could be saved through the various e-publishing initiatives: current journal subscriptions, converted back files of journals, e-books available from the publisher, less current e-books that have been converted and made available through intermediaries, and GPO's transition to a more electronic Federal Depository Library Program.

The long-term availability of online equivalents from a "trusted source", meaning either a publisher or a publisher service provider, is the most important criteria for the libraries in determining whether print journals can be withdrawn or print subscriptions cancelled. The Planning Group felt slightly more confidence in non-profit organizations based on the perception that they were less constrained to require a return on their investment, and more committed to sustaining the service. The pricing model is also a factor because future electronic access might be jeopardized by potential price increases. Additional factors included whether the title was indexed, the completeness of content, and local requirements for print versions for the faculty.

Books

At the present time, the industry does not offer a book reader that competes in ease of use or affordability with the printed book when the patron wants to read substantial portions of the text. Library patrons and staff are finding that e-books are most useful as reference works and when access to only a part of the book is needed, such as when books are evaluated for print purchase, or when extracts are needed for reserve use.

Twenty leading publishers account for 20% of the books acquired last year by the Tri-Colleges and approximately half of these titles are likely to be available in electronic form by 2003. However, given the lack of suitable reading devices and the unknowable

long-term future for e-books, the libraries expect to continue buying print copies of any needed books so they can be easily used. As e-book availability increases, and depending on pricing models, access to a database of current e-books online could serve as both a preview and backup tool. Such availability, particularly in conjunction with print-on-demand services, might be used to reduce the duplication of print copies. Any reduction in duplication through this means is likely to be gradual, and might be used to purchase a broader range of titles, so the Planning Group did not predict any near-term or strong effect of e-books on the collection growth rate.

Electronic collections of older books have been slow to develop due to the cost of creating an electronic version and the problems of securing the necessary copyright clearances. As the Million Book Digital Library Project becomes fully operational, it may offer the Tri-Colleges an opportunity to convert books they might otherwise consider storing off-site. Since this Project is still in its pilot phase, the Planning Group did not project any specific space savings.

Journals

In discussions of e-journals and space, the Planning Group focused on reliability of publisher or supplier back files, and the concerns of the appropriate faculties. The Tri-Colleges have already been reducing or eliminating print runs and making binding decisions based on these criteria, applied on a title-by-title basis. Because back file security is a concern for all academic libraries, many national initiatives are addressing it. Although we expect improvements will continue, the pace cannot be predicted.

Reference Databases

No market research was done on trends in electronic publication of A&I and similar services. The Planning Group believes that, rather than an emerging trend, such publication is now the norm. In the last five years, all the libraries have freed significant amounts of reference shelf space by discarding print reference works and canceling print subscriptions in favor of the electronic services. We will continue this practice both for print overlap with existing database coverage, and as additional works go online or as back runs are filled in. However, we cannot predict the timing of these changes and we believe that the major space gains have already been made.

IV. Understanding Student and Faculty Use

The focus groups were designed to improve our understanding of how faculty and students use the libraries in the Tri-Colleges, to communicate the challenges facing the librarians and to obtain feedback on the options being considered. Through this dialog we intended to advance the conversation on each campus and provide insights useful for the planning process.

Focus Group Process

A total of 7 focus groups were conducted in October 2001: one faculty and one student group on each campus, plus an additional faculty group at Swarthmore.

The faculty groups represented different disciplines with the intention of gaining insights on the impact of electronic resources on teaching and information research needs. The faculty focus groups ranged in size from 4 to 12. Student groups ranged in size from 5 to 7 upper-class undergraduates, with a few Bryn Mawr graduate students in attendance. Questions were modified as needed to accommodate the number of participants and the nature and direction of the discussion.

Results

Participants used different phrases, but consistently identified three essential steps in the use of materials:

1. The discovery process – identifying the item,
2. The selection process – making the decision to use it,
3. The delivery process – accessing the full text.

The following summary of results begins with abstracted comments about these areas, followed by other major themes that emerged in the discussions.

The Discovery Process

- Online searching is good for finding known items.
- Online searching is less successful for unknown items, new topics and unfamiliar terms.
- Shelf browsing is highly valued as a way to discover relevant materials, especially for the humanities faculty.
- Browsing is an important tool for print or electronic materials, but browsing in electronic sources is not as intuitive as shelf browsing.
- There was little awareness of online virtual shelf browsing in the OPAC, and where it was known it was not seen as especially useful.
- Some students reported finding more books looking at the shelves than searching online; others found both Tripod and PALCI good sources of materials.
- Full text searching for journals, especially in JSTOR, has allowed people to find materials they otherwise would not have known about.
- Expanded information in the OPAC about each title would improve the discovery and retrieval process.

- Students have access to a broader range of resources online than they had before. This ease of access and breadth of material is reflected in higher quality work. (faculty member)
- Faculty often expressed the opinion that books needed to be in the local collection or students would not use them; students, on the other hand, reported frequently requesting books from other libraries in the Tri-Colleges and through PALCI.
- Alerting services work best on narrow topics; they are of limited value for faculty teaching general interest courses.
- Upper level students in their majors felt they were familiar with the libraries and with significant tools in their disciplines.
- The most effective instruction in library use is based on particular assignments. .

The Selection Process

- The quality of the information on the web is not always good.
- Students need to learn critical evaluation skills.
- Shelf browsing is an effective way of both finding good materials and rejecting inappropriate ones.
- Students noted that faculty often encouraged them to use materials that were less than 5-10 years old.
- Tripod doesn't give you a lot of information about the books, so you're not sure if they will be useful; students feel it is wasteful to order books from another library and on examination find they are not useful.
- Early undergraduates were more likely to use e-reserves and links from the faculty syllabi without realizing that they were using journal articles.

The Delivery Process

- Guaranteed long-term access to electronic materials should be assured before print is removed.
- Print materials needed for curriculum support were time sensitive and should be housed on the campus where the course is being taught.
- Students use materials required for their classes, preferring those that are easy to use and link directly to the full text.
- If materials need to be retrieved, it would be advantageous if they could be delivered to their offices. (faculty member)
- Local ownership of the materials in the faculty's disciplines is an important part of having a good academic library; ownership and accessibility through the other two colleges is not the same.
- Faculty don't feel that remote storage is an attractive option.
- Students seem comfortable using materials on other campuses either in person or by requesting them.
- Some students reported weekly visits to or weekly use of materials on another campus.
- Missing content in online journals (as opposed to print) is a problem; sometimes it is the letters or advertisements that are important.

- Microform as an alternative way to get full content is not acceptable; delay or traveling to get a print copy is preferred to microform.
- Students liked e-reserves.
- E-reserves can be difficult to read if not properly scanned.
- PALCI was deemed easy and timely to use by both students and faculty.
- Reading online resources on the screen is not acceptable; all participants printed online articles but also expressed concern about the amount of materials printed, especially printouts that are never retrieved.
- Once a journal is available in electronic form, science faculty felt that the print volumes could be located remotely and retrieved if needed, and their personal copies could be cancelled.

Other Major Themes

Use of the Web

- The Internet has had an undeniable impact on teaching.
- Immediacy of the web, especially for news and access to scholars' web pages is a truly useful tool.
- Reliance on electronic resources varied by discipline as perceived by both students and faculty. Science and social science disciplines have considerable amounts of online resources; humanities still rely heavily on print.
- There are both faculty and students who are not comfortable with computers and electronic access.

Un-circulated Books and Weeding

- In response to data presented on the percent of volumes that don't circulate, faculty members almost universally rejected it as an indication that collections could be weeded.
- There is concern that in-library use is not being counted.
- The physical context of a unified collection in one location is important.
- Browsing physical shelves is important both to discovery and evaluation of materials.
- Lack of past use is no indication of lack of future need.
- Use of old books may be different; instead of checking them out to read, faculty may use them for reference and background information.
- Faculty noted that students depend heavily on browsing.

Library As Place

- All agreed that space for viewing videos with small groups is highly desirable and should be added or expanded.
- There is a need for comfortable space on each campus that would appeal to both students and faculty.
- Faculty and students commented on the need for group use and quieter individual use areas.
- Faculty and students support social spaces and coffee service.

- Faculty use of the library facility is declining due to the amount of desktop access to content via the Web and Tripod.
- Faculty use the library to read current issues of print journals not available online, to review approval books, to put materials on reserve and to meet with students.
- Some faculty believe the campuses should strongly reconsider creating more library space for books and other activities before any serious weeding is undertaken.
- Students liked the wireless laptops that can be checked out at Swarthmore and Bryn Mawr for use anywhere in the library.
- Faculty with library carrels appreciate the convenience and quiet study space.

Key Findings

- Use patterns of both print and electronic resources are driven primarily by convenience and time; for students cost is an additional factor.
- There is a need to develop new spaces in the library, particularly comfortable informal areas, group study areas and video-viewing rooms.
- Browsing the physical collection is highly valued; online browsing is considered an unsatisfactory substitute.
- Materials needed for classes must be held in the local library.
- Faculty want to be consulted and have meaningful input into any decisions, particularly extensive weeding, that affect the collections.
- The online catalog and other searching tools need to have more ways to suggest similar materials and encourage serendipity.
- Having additional information online about resources would improve the selection process and result in more efficient borrowing.
- Faculty members almost universally rejected the evidence of lack of circulation as an indication that collections could be weeded.
- Faculty often expressed the opinion that books needed to be in the local collection or students would not use them; students reported frequently requesting books from other libraries in the Tri-Colleges and through PALCI.
- For some faculty local ownership of the materials in the faculty's disciplines is an important part of having a good academic library; ownership and accessibility through the other two colleges is not the same.

- Different usage patterns in different disciplines need to be taken into account; general systems for collection management should not be applied.
- Electronic information sources are heavily used and appreciated, especially in the sciences; in some disciplines they are changing the way research is done.

Discussion of Understanding Student and Faculty Use

Both students and faculty see the library as an important place for study and social life. It is seen by some as a quiet refuge from noisy dorm rooms or office interruptions, and by others as a place to hang out and meet friends. Where café services are available, they are appreciated. Faculty commented on the ambiance of some of the library buildings, contrasting those with poor lighting and older seating to those with more cheerful and comfortable facilities. Both students and faculty wanted the spaces to be attractive and services to be offered as a way to encourage library use. Among specific uses, video-viewing facilities and group study areas were most frequently mentioned as desirable.

Both students and faculty place a high value on browsing of physical collections. Physical browsing is important for print materials due to the limited information available in the online catalog for both discovery and selection. Users mentioned that a search for a topic might turn up only one or two books, but examination of the shelves at those call numbers would reveal many more. Users must rely on searching the right terms used in cataloging, since the full text of most titles cannot be searched online. When selecting a book, users like best to examine the book itself rather than rely on the limited cataloging data. The table of contents data added to newer titles was mentioned as desirable for all. Faculty feel that browsing is absolutely essential for students who, they believe, chiefly use what is available in their own library. Students, on the other hand, seem familiar with options for Tri-College requests and ILL, and are comfortable with using them, especially if the materials are delivered quickly.

Participants were asked what kind of material needs to be available in one hour, one day or one week. All agreed that materials needed for classes must be located at the local library, and duplication is necessary if the same subjects were taught in different schools. The definition of the materials needed was very broad in faculty responses. In preparation for a lecture, if a faculty member finds a need for a previously un-used resource, he/she wants to find it immediately available. For research purposes, and particularly in the summer, the faculty said cross-campus borrowing and ILL are acceptable ways to get materials.

Almost all patrons appreciate electronic databases and journals for both ease of discovery and ease of use. The science disciplines rely most heavily on journal literature, and increasing amounts of their journals are online in full text. Faculty in the sciences generally commented that, for journal literature, electronic access is fine and that print materials are not needed when e-journals are available and reliable. In the social sciences and especially in the humanities, there is more reliance on monographic literature and less full text available even in the journal literature.

The discovery and selection process for print books is made less efficient by the lack of sufficient information on book content in the OPAC and the absence of full text retrieval. Any de-duplication of monographic holdings would increase this problem by decreasing browsing, which in turn increases the need for expanded metadata. Also, although online virtual shelf browsing and related item searching are available in the OPAC, these options are not obvious to patrons. OPAC redesign to emphasize these and other functions would increase user discovery of appropriate materials. Emphasis should be placed on increasing usability with improved, yet simplified searching and software that will allow for serendipitous discovery online.

Faculty were unimpressed with data about the large percentage of books that had not circulated in ten years. They doubted both the accuracy of the data, since it did not reflect in-library use, and the advisability of weeding collections based on the lack of past use. Although some faculty are willing to accept limited weeding to make space for new books, the more common reaction to the lack of growth space was to advocate for building more library space on campus. Remote storage was not accepted as an attractive alternative. Students were more willing to accept quick delivery from another library as an option if they have good information about available books.

For students, electronic access has blurred the distinction between different types of material, so that they do not always identify articles found online as “journal articles.” After using online journals, they experience print journals as a new type of literature which is difficult to navigate; they feel that they need more training.

Students initially rely on text books, reserve readings and resources pointed out by the faculty before moving to aggregated databases of content with journal articles immediately available to them. Electronic reserves are greatly appreciated by students as an alternative to print reserves. Once students begin working in their major, they learn about discipline-oriented indexes from either a librarian or their faculty. In each group students commented that effective instruction in library resources needs to be linked to specific assignments.

All constituencies were concerned about the large amount of printing for journals and e-reserves, but all also observed that they could not read more than one to five pages online.

Although it is assumed that the majority of faculty and students are familiar with the Web and electronic resources, not all users feel that they are computer literate. In an information-based society, graduates need to know how to use information resources and multimedia and understand how to incorporate them into word processing, spreadsheet and presentation programs.

V. Space Planning Options

The impetus behind seeking the grant originally was the realization that the libraries on all three campuses had growth constraints. At Bryn Mawr there is to be no expansion to any of the library facilities; at Haverford, the question is yet unanswered, but the assumption is that there will be no new space in the foreseeable future. At Swarthmore any addition must await the next campaign, which could be ten to fifteen years away. Therefore, a central element of this grant project was to see if it was possible to develop a new model of collection growth. Under consideration were the impacts of consortial collection development and of acquisitions of e-resources on the rate of growth of each college's printed collections. This section explores library as space, defines space requirements in library buildings, and provides an overview of the current state of holdings and the current rate of growth in each library. It summarizes the findings on de-duplication and weeding of the print collections, and looks at the space savings realized by the libraries in moving to electronic journals and reference sources as a predictor of what we might expect as the minimum level of future space savings.

Library As Space

In February 2002, attendees at the ARL/OCLC Strategic Issues Forum explored the concept of the library as a space for academic life that allows room for social and intellectual activities. Two themes emerged from the Forum: 1) the shift in focus from space and place to people and their activities in the buildings; 2) an expanded view of the library's role on campus, integrating learning oriented functions. Many libraries are home to other co-curricular functions such as language labs, writing centers, and tutoring centers. Integrating these "learning functions" not only makes sense on a theoretical plane, but also practically because of extended library hours and staffing. Furthermore, as faculty revise courses to include new electronic resources, students want enhanced space with group media viewing rooms, discussion areas, and ready access to computers. Input from the focus groups and from a Swarthmore College survey of study space point to the need for more space for computers, leisure seating, tables and group meetings.

Figuring out how long our existing buildings could accommodate linear growth of our collections is relatively simple. However, in order to accommodate the various formats in which knowledge is "published" and the way people learn from those materials, libraries have to provide new types of spaces. This is not new since libraries have always made room for new formats and the equipment to facilitate their use. What is new is that libraries are expected not only to accommodate passive use of these materials but also to enable faculty and students to integrate these resources in creating new knowledge. Faculty and students expect to be able to read, view, and listen to media and also scan, capture and edit materials that they may wish to use in the classroom or in assignments. In response, libraries are incorporating spaces such as digital media labs as a natural progression from supporting viewing to supporting the production of multimedia.

For our libraries to add this type of functionality is not simply a matter of trading a traditional carrel for one equipped with multimedia hardware. The amount of space

required for multimedia functions increases with the nature of use: 3% increase for viewing, 8% for creation and 10% for production facilities. For example, a standard carrel for reading is 36" wide while a multifunction workstation needs to be 51" wide. Additional space may be required for functions such as production studios or editing rooms and for staff support of these functions.

Space Requirements

Standards for library shelving have established "working capacity" at 86% of the linear feet occupied. Beyond this level the space becomes too crowded to function efficiently causing problems in re-shelving books and locating material.

According to Habich⁴ the average width of materials across all disciplines in an academic research library is .99"/book and 1.77"/bound periodical which equates to 12 books/linear foot and 7 bound journals/linear foot. Compact shelving vendors use an average of 8 volumes per linear foot and the average for the Tri-Colleges is 9 volumes per linear feet of books and bound journals. As wider bound journals are removed creating a higher balance of books, then the Tri-Colleges may wish to use 10 volumes per linear feet in its calculations.

Linear footage measurements include space currently housing government documents. These collections are experiencing flat growth with the cancellation of U.S. Government Depository status for Haverford, and increasing publication of government documents on the Web.

The Current State of the Collections: Holdings and Growth Rates at the Three Colleges

Based on the library standard definition of 86% working capacity for shelving and our current annual growth rates of print materials, the Tri-Colleges will reach working capacity in the next 15 years.

	Bryn Mawr	Haverford	Swarthmore
Shelving available	133,660 LF	64,632 LF	95,099 LF
Working Capacity (86% of capacity)	114,948 LF	55,584 LF	81,785 LF
Shelving in use	88,067 LF	52,172 LF	81,451 LF
Current % of Working Capacity	76.6%	93.8%	99.6%
Annual growth	1,738 LF	716 LF	1,052
Years to reach working capacity	15 years	5 years	0 *

In 2001 Swarthmore added compact shelving in its science library that extended the shelving capacity of that facility by 6 to 10 years. Reductions in print journal volumes as a result of conversion to online access have already and are expected to continue to result in savings in linear feet of shelving in the science library. * Swarthmore has completed a

⁴ Elizabeth Chamberlain Habich, *Moving Library Collections: A Management Handbook* (Westport, CT: Greenwood Press, 1998). Appendix A: Average widths of library materials, Figure A1.1

Master Plan utilizing compact shelving in its main library that should extend shelving capacity by nine years. Funding has not yet been approved for this plan.

Architectural plans have been drawn for Bryn Mawr's main Canaday Library, which needs to be renovated to accommodate an expanded range of services for the students and faculty. It is likely that the plans will reduce shelving and thus dramatically shorten the time before Bryn Mawr reaches capacity and may virtually eliminate the 15 years of expansion space available today. Building a new wing onto Canaday Library for additional collections and new programs is not an option because of strict township building regulations.

Haverford just completed the construction of a new science library with less combined space than the two separate collections occupied previously. Haverford has 5 years of growth space before reaching working capacity.

The Impact of Consortial Collection Development

At the start of this study, we believed that a Tri-College collection development plan had the potential of helping the colleges realize space savings in two ways. It could slow the growth rate of print collections by minimizing the amount of duplicate materials bought and housed by the libraries. For example, of the nearly 5,500 books purchased through the ABC approval plan by Swarthmore last year, 80% were also purchased by the Bi-College Haverford/Bryn Mawr plan. Reducing the duplication rate to 50% would save approximately 165 linear feet per year. However, any decrease in duplication of new materials would likely be offset by the reallocation of dollars to the purchase of other new materials and would only result in space savings if those new materials were electronic.

The best potential for space savings, therefore, needs to come from weeding existing collections. The data indicates that the older the material, the less it is used. In fact, usage figures (as measured by circulation) drop significantly for materials published before 1950. As noted above, over 80% of materials published before 1950 has not circulated.

Up until now, weeding decisions by the three colleges have been made independent of each other. Haverford has an ongoing program of weeding that is considered good for the health of a collection. Over time, ideas about the collections and the curriculum have changed and some items may no longer be needed to support coursework or research. Swarthmore has focused on weeding its collection in the sciences. It also has a regular review of multiple copies of older materials in other disciplines that is triggered by overcrowded sections of shelving. Many of the multiple copies were originally purchased as course reserves though they have not been used as such for more than 10 years.

The idea of weeding may require a shift in thinking that runs counter to the belief that a big library is a good library and that materials must be locally held to be of value. The administration, faculty and students will need to be comfortable with the vision of one

collection and with the idea that not all materials need to be kept as a permanent part of the home collection.

In preparation for moving parts of their collection in the summer of 2003, Swarthmore identified books in religion and philosophy that met strict criteria. The titles were:

- held on at least two of the campuses
- published prior to 1980
- no local circulations in the last 12 years or less than 5 circulations since 1970
- never placed on reserve
- not a gift
- generally secondary sources, not primary source material
- not authored by Swarthmore alumni or faculty

Preliminary faculty response to suggested withdrawal lists in philosophy indicated that about 35% of those meeting the criteria may actually be deselected, but in religion the numbers were fewer than 10%.

The data showed that among the three libraries there are 175,000 volumes that are overlapped and have had no circulation since 1991. If the libraries could weed one of the duplicate copies, that would amount to a potential 87,500 items or approximately 8,750 linear feet in space savings. However, if the faculty determine that 80% should be retained, the space gains will be small in comparison to the amount of work required to achieve them. The lists of potential volumes were reviewed by the humanities subject specialist and all the faculty in the departments. At the current rate of growth of our collections, if we were to realize the maximum space gains for weeding one copy of all duplicate items, we would gain two to three years of growth space. Swarthmore's weeding project suggests that the target areas for weeding may need to be expanded. For example, while 175,000 volumes have not circulated at all, a much larger number have circulated once or twice and a single copy could support that level of use. Overall, there are more than a half-million volumes that are overlapped in the libraries. The other thing suggested by the Swarthmore project is that we need to make clearer to the faculty the relative costs of retaining low use materials on-site versus having them available within the Tri-Colleges.

While weeding alone may not solve our space problems, it can provide us with sufficient incremental gains in shelving capacity until additional space savings may be realized through increasing use of electronic books and journals.

Finally, we need to look more closely at faculty attitudes towards off-site storage. At one point, we were thinking that having a volume located at another Tri-College library was a type of off-site storage. However, from discussions with faculty in philosophy, it is clear that the issue is one of ownership. Unfortunately, neither the focus groups nor the weeding project addressed the level of tolerance or the relative costs and effects of remote storage as compared to de-accessioning. It is imperative that we gain a better understanding of faculty attitudes toward these options.

Impact of E-resources

In considering whether the libraries could withdraw or relocate print volumes once titles are available in electronic form, the Planning Group considered various factors:

- Content availability needs to be from a “trusted source”, either a publisher or a publisher service provider
- Future electronic access must not be jeopardized by rampant price increases
- Archival guarantee from provider
- Indexed product
- Content completeness
- Local faculty requirements for print versions

We have already begun to realize some space savings by shifting from print to digital formats and, as the acceptability of online services grows, we expect to experience substantial savings here. In a number of cases the libraries have cancelled print journals when online versions became available. For example, Swarthmore’s science library cancelled 48 print titles for 2002, thus reducing the requirement for shelving new volumes by 340 LF in the following year. After some consultation with faculty, the three science librarians selected those journal titles whose pre-1960 volumes needed only to be held on one of the three campuses. This resulted in savings of approximately 150 LF in each building.

Access to reliable electronic journal back runs offers opportunities for the Tri-Colleges to reduce duplicates. An existing Tri-College report calculated that the number of print volumes of JSTOR titles that could be de-duplicated was approximately 10,000. Increasing this by 50% to 15,000 volumes for the new sections added to JSTOR amounts to an estimated 1,666 linear feet that could be saved jointly by withdrawing duplicate volumes. A similar strategy of reducing print back files to a single copy could be employed as publishers expand their journal archives, although the projected savings have not been estimated in linear feet. In our reference collections, we have stopped subscriptions to printed indices and abstracts that we receive as databases and, in many cases, we have weeded back runs of those materials. It is possible that there are more savings to be realized here but this needs to be done as a project.

Currently the e-book shows its greatest potential in the areas of reference and reserve readings. It has not yet developed its full potential as a substitute for a print stack title that can be read in the traditional manner.

In the past four years there have been notable reductions in the space required to house Swarthmore’s Federal Depository collection due to the transition to electronic format. In 2002 there were additional reductions due to the re-aligned depository arrangements among the three colleges that are described elsewhere in this report. It is expected that the GPO transition trend will continue but at a decreased rate.

Location	1998/99	1999/00	2000/01	2001/02
SuDocs collection	5869	5348	4316	2727
Docs in LC collection	1193	1007	1299	1061
Docs Periodical Titles	133	129	111	46
Total print receipts	7195	6484	5726	3834
Linear Feet Added	138	125	110	74
Fiche added	2727	1405	356	294
Electronic records added	588	854	1991	1873

Options for Maximizing Linear Feet of Shelving

It is likely that in the immediate future the Tri-College libraries will use a combination of on-site compact shelving and off-site storage.

Compact Shelving On-site

The libraries have been taking advantage of compact shelving to expand their capacity to house materials. Haverford is using compact shelving in their new science library; Swarthmore gained 10 years of growth space in their science library and plans to install additional compact shelving in summer of 2003 for periodicals and government documents. Bryn Mawr is the only one of the three that has space remaining with the required floor strength to add more compact shelving.

Compact shelving covers a range of options from manual, mechanical assist and powered mobile shelving which reduces aisles to 1 for every 6 ranges of bookshelves. While it allows on-site browsing it limits the number of users at one time. If lesser-used materials are stored on the shelving, this is not an issue.

High Density On-site

Commonly known as an Automated Storage Retrieval System (ASRS), this is typically an on-campus option that automates the retrieval of books stored by size. First installed at California State University (CSU) at Northridge in 1991, it enabled them to create the space to store 950,000 volumes in 8,000 assignable square feet, 1/10 the amount required for open stacks.

Adapting inventory control systems and robotic technology used in commercial warehouses allowed CSU to store books by size in bins that would be automatically retrieved so that staff could pull the desired item. Benefits of restricted access include prolonging the life of material by minimizing handling, providing environmental control, improving inventory control and improving the reliability of access.

Subsequently Eastern Michigan State University and the University of Nevada Las Vegas (UNLV) installed an ASRS. In addition to allowing room for growth, the system at UNLV housed old periodicals, little used books, government documents, special collections, and older reference materials.

High Density Off-site

Over 20 of the largest research libraries in the U.S. have created off-site storage centers in the last decade including: Harvard, Yale, Johns Hopkins, Cornell, University of California system, University of Michigan, University of Minnesota, Penn State, University of Pennsylvania, University of Pittsburgh, Virginia Tech, and the University of Texas at Austin.

Known as a High Density Book Shelving System (HDBSS) pioneered by Harvard in 1984, sites store materials by size in containers on 30-40' high shelves. Operation of this type of facility requires an inventory system, and the books must be bar coded and retrieved by an order picker. For preservation purposes and to extend the natural life of the materials being stored, the space is climate controlled for temperature, relative humidity, light, pollution, vibration, pests, insects, and is protected in terms of fire and water damage.

Storage facilities that store low-use materials report annual retrieval rates of 2-4%.⁵ Given the need for mediated retrieval and the sensitivity of researchers to the lack of direct access, performance standards are a core part of service arrangements for reliable retrieval.

At the beginning of the grant in 2001, Bryn Mawr and Swarthmore considered joining a local consortium of cultural institutions with the intent of using off-site storage for 20%-25% of their book collections; however, funding has not yet materialized. Existing sites within the region for possible collaboration include facilities run by the University of Pennsylvania, and collectively by Princeton, Columbia and New York Public Library.

It became apparent during the Planning Grant that removing little used books off-site would limit opportunities for discovery thereby decreasing the likelihood of their being used. When the Planning Group considered digitizing the table of contents for stored books, they were faced with the irony that they would be providing better access to their least-used collections. Nitecki & Kendrick in *Library Off-Site Shelving* call this the “paradox of off-site” as users “begin to wonder why we can’t provide a higher level of service for all of our collections, not just the materials stored remotely.” They went on to point out that an “off-site program puts pressure on research libraries to improve services across the board, not solely in support of collections transferred to the high-density shelving facility.”

Materials typically relocated to off-site, where they can extend the life of the materials through climate control, are those that may be used once in a generation. The books benefit from security and preservation while the users trade the opportunity to shelf-browse for the opportunity to provide space for new materials and for requested programs and services. Nitecki & Kendrick noted that there is an “emerging theme in how readers think about sources of materials...and increased expectation that everything they need can

⁵ Danuta A. Nitecki and Curtis L. Kendrick, eds., *Library Off-Site Shelving: Guide for High Density Facilities* (Englewood, CO: Libraries Unlimited, 2001)

be requested easily, reliably supplied and delivered to a convenient array of locations or via a useful array of technologies.”

Key Findings

- Libraries need additional space not only to accommodate collection growth but also to provide new services such as multimedia production, writing centers, group study spaces, and common areas.
- Minimizing duplication of purchases will not necessarily net large space gains, but will allow us to use saved dollars for increasing depth and scope of the collections.
- Important space gains might be made through weeding duplicate copies of materials which have not circulated in the last 11 years. To realize even greater gains we will need to 1) expand the scope of materials considered for weeding and 2) implement a routine weeding program in all libraries. Building trust with faculty is critical to cost-effective weeding programs.
- Faculty need to be engaged in discussions of the relative costs and benefits of de-accessioning as compared to remote storage.
- Conversion of journals to electronic formats is already creating significant space savings (an estimated 340 linear feet per year) and we expect these savings to continue to grow in the sciences and eventually to impact first the social sciences and lastly the humanities. Other significant space savings are being realized in reference and government documents. Space savings through purchase of electronic books is probably at least five years away.

VI. Exploring New Models

Moving to a Unified Collection

Since the introduction of Tripod in the early 1990s, the three college libraries have become increasingly interconnected in the ways they develop their collections and do their work. Now faced with growing pressure on space at all three institutions, the libraries are presented with two choices for the future of their collections. On the one hand, the libraries can continue on much the same path as they have been on for the last decade, with cooperative purchasing activities where appropriate, but maintaining three independent liberal arts college collections. If the libraries choose this path, then each of them will have collections that look much like the others. They will continue to buy many of the same books every year, and they will continue to house many of the same older, little-used books.

The alternative vision is to take advantage of the power of the unified catalog, and treat the three colleges' collections as one collection, capable of providing the range of resources similar to those of a comparably-sized university library. Of course, each of the libraries needs to have a core collection that supports a liberal arts curriculum, probably in the range of 100,000 to 250,000 volumes judging from the circulation statistics. Beyond that core, though, the libraries have the potential to build their collections into a coherent whole that is capable of supporting the research needs of our students and faculty to a much greater extent than is being done at the moment. Developing this larger research collection means working together to shape the existing holdings with an eye to maximizing the range of titles held in the system. It also means acquiring new materials in a collaborative manner that limits the number of titles duplicated in the system, and thereby frees up money to buy a wider range of more specialized research materials. The Planning Group recognized that this model for library collections presents many challenges: defining a core collection, buying new books collaboratively, and defining new areas in which to acquire materials, among others. At the same time, the Group believes that this model has great potential for providing the rich library collections that our students and faculty need to do their work.

Changing the Ways the Libraries Work

As the libraries move toward a unified view of their collections, they are finding it necessary to create new ways of doing their work. In the last few years the libraries have made considerable progress in creating mechanisms for managing collections in a collaborative environment, reaching decisions about new resources, and communicating about collection interests and opportunities. More significant changes are likely to be necessary as the scope of cooperation expands. To assess the scope of these changes, the Planning Group looked at three areas:

- Organization of collection development across the three colleges
- Development of tools to manage cooperative collections

- Creation of an environment in which cooperatively-built collections can be used effectively by faculty and students

Organization of Collection Development

Each of the three libraries takes a different approach to organizing its collection development activities. Bryn Mawr has seventeen librarians who serve as liaisons to academic departments and programs; Haverford concentrates the duties among eight librarians; and Swarthmore has five liaisons. The numbers do not tell the full story. At Bryn Mawr, the liaison program is only four years old. Previously, responsibility for collection development had been concentrated in a few hands, principally the director of the library, a bibliographer, and the heads of the branch libraries. All of the librarians now have collection development duties, but many of them are still learning the work, and for most, collection development is a minor part of their jobs. For many years at Haverford, more than half of the librarians have been involved as bibliographers in collection development, and it has long been regarded as an important component of their work. Swarthmore has the fewest number of librarians in collection development, and most of the work is concentrated in the hands of three people: the librarians for the humanities, social sciences, and sciences. Each of the libraries has a head of collection development responsible for coordinating the work.

The differing organizational structures at the three libraries present challenges to undertaking Tri-College collection projects. The decision-making process also varies among the campuses and among disciplines. The burden of work naturally falls most heavily on those responsible for the largest number of disciplines. Experienced bibliographers who have built strong working relationships with their faculty tend to have an easier time reaching decisions than do newer librarians with less familiarity with both their faculty and the discipline. As the collection decisions become increasingly interconnected among libraries, more opportunities will need to be found to upgrade collection development expertise across the libraries through in-house training, release time for further academic work, and opportunities for experienced bibliographers to share their expertise with newer staff. A re-examination of the libraries' organizational structures for collection development may also be warranted to see if a closer alignment of structures would help to improve the quality and speed of decision-making.

Given the size of the libraries' staffs, increased collaboration also presents an opportunity for moving toward the model of the university library subject specialist. Currently the libraries follow a liberal arts college model, in which librarians are generalists and provide reference, instruction, and collection development services to a number of departments. In the subject specialist model, the librarian has advanced academic training in the discipline and focuses on building strong research collections and supporting the teaching and research of faculty and students in that field.

How far to go in the direction of the subject specialist model is a matter for more discussion and testing. At one extreme is a replication of the research university model, in which a single bibliographer is responsible for all collection decisions and advanced

reference work in an academic field for all three colleges. But there are also intermediate steps, such as establishing Tri-College subject specialists in fields where expertise is difficult to come by, such as East Asian languages, or as a way of recognizing and taking advantage of the special expertise of certain librarians. The role of the Tri-College subject specialist is also open to different models. Overseeing all collection development in a field is one possibility, or subject specialists could play more restricted roles that would still help to elevate the level of collection decisions and research support that the libraries provide. They might, for example, serve as advisors to senior thesis writers at all three campuses, help with evaluating difficult collection issues, or provide guidance to new librarians on best practices in collection development.

Tools to Manage Cooperative Collections

As the libraries move toward increasing cooperation in building and maintaining their collections, it is essential that effective mechanisms for sharing information and making decisions are created. The libraries have already taken a number of important steps in this direction. As a beginning, the three heads of collection development meet on a regular basis, as do other groups with common interests, notably the science librarians. In addition, the following data gathering and decision-making structures are now in place:

- *Collection Statistics.* The data gathering required for this report produced the most comprehensive view of the print collections and the way they are used that the libraries have ever had. All of the subject bibliographers have access to the data through a common web interface. Steps are now being taken to ensure that these statistics are updated annually, and that discrepancies in the way the libraries record data are eliminated.
- *Electronic Collections Data.* The technical services departments of the three libraries have developed the Electronic Resources Tracking System (ERTS), a database that records critical information, such as price, renewal date, and access restrictions, for all of the electronic collections to which the libraries subscribe, whether individually or as a group.
- *Electronic Resources Group.* To manage the acquisition of electronic collections, the libraries have formed the Electronic Resources Group, a committee consisting of two librarians from each campus, and reporting to the heads of collection development. One of the members of the committee is the chief negotiator for Tri-College electronic purchases, a role he has performed for the last two years. To track information about resources being considered, the libraries have set up a “Trials Database” that lists the products currently under trial, the terms of the purchase, and the date the trial ends. It also provides a comment board for librarians to post their assessments of the resource.
- *Analysis of Curriculum.* During the course of this study project, the Planning Group tried to compile systematic data on the curricular interests of the three colleges in order to quantify potential demand for collections in different subject areas. The

Group obtained course lists from the colleges' registrars, converted them into a database, and began the process of cataloging them. The project proved to be too large to complete during the course of this study, but enough was accomplished to demonstrate its potential for drawing a clearer picture of each campus's interests.

- *Last Copy Policy.* Earlier this year the libraries adopted a policy governing the weeding of collections, designed to ensure that weeding projects do not eliminate materials that are likely to be needed on other campuses.
- *Specific Projects.* Over the last three years the libraries have undertaken a number of projects that have brought together bibliographers from the three campuses to work on common problems. These projects have included identifying websites for inclusion in Tripod, creating Tri-College subject guides for the web, canceling standing orders held by more than one library, and agreeing on electronic journals to acquire through ScienceDirect.

As a result of these efforts, the librarians at the three colleges are building good working relationships with each other, are gaining an appreciation for the potential richness of the libraries' combined holdings, and are developing tools to improve the understanding of existing collections and concomitant decision-making. These structures and working relationships have been necessary initial steps toward building an integrated Tri-College collection, but more will be needed if the work is to progress.

The two most important goals are reducing the duplication in existing collections to open up shelf space for new books and journals, and reducing the duplication of current publications to free up money to build stronger collections in the colleges' fields of interest. In order to accomplish these goals, the libraries will need to develop more systematic and coordinated methods for weeding the collections and acquiring new materials.

De-accessioning. A high percentage of the Tri-Colleges' volumes show little or no circulation over the last ten years, and a significant number of these low-use volumes are held by more than one library. If low-use duplicates and outdated texts can be weeded, the libraries stand to gain substantial amounts of expansion space without reducing the overall depth of the shared collections. To coordinate such a large-scale weeding project across the three campuses, the librarians will need to work closely with faculty to gain a clearer understanding of what books need to be close at hand and what can be housed at one of the other sites. The mechanics of making large-scale withdrawals in a collaborative and efficient way need to be worked out. The best physical copy of each book should be retained, and no library should withdraw books that are of potential interest to another. During the most intensive period of weeding, additional Tri-College staff will be needed to manage the withdrawal process in order not to overwhelm the libraries' regular staffs, and to ensure that the process runs in a timely fashion with appropriate communication in place.

Approval Plans. The libraries purchase more than half their monographs through approval plans, with a total dollar amount of more than \$500,000. Approval plans are a way for the libraries to receive new publications from major scholarly publishers automatically, thereby giving the libraries a high degree of confidence that most important new works are being acquired, while substantially reducing the cost of acquiring them. Bryn Mawr and Haverford have operated a joint approval plan since the early 1970s. By pooling their book-buying dollars and keeping their duplication rate to about 15%, the two libraries have been able to build substantially broader collections than would have been possible if they had worked independently. Swarthmore began using an approval plan five years ago. In the last year approximately 80% of the books acquired through the Swarthmore plan were also acquired by one of the other two libraries, with a dollar value of approximately \$170,000. If the three libraries can find a way to coordinate their approval plans, a substantial amount of money can be freed to invest in materials not currently being acquired.

There are several approaches that could be taken to coordinating approval plans. The first is a Tri-College version of the current Bryn Mawr-Haverford plan. With this approach, the three colleges would agree on a profile designed to acquire most new academic press books automatically. If the plan were to follow the existing Bi-College model, bibliographers from the three colleges would examine each week's shipment of books and then meet to decide where each new book should go and which books should be duplicated. The problem with this model is the burdensome amount of travel and discussion that would be required of the bibliographers. Certainly some communication can take place by e-mail and conference call, but decisions on location and duplication can be difficult without examining the books firsthand. This approach could become much more practical if publishers and approval vendors were able to provide substantive information about their new books in advance. The approval plan vendor for all three colleges, Academic Book Center/Blackwell, has expressed an interest in opening discussions toward creating a "virtual approval shelf" that could eliminate the need for much of the physical examination of the books.

The libraries should also explore other options for managing their approval plans, in the event that the "virtual approval shelf" proves impractical. One possibility is for the three colleges to have a single approval plan profile, but rather than the librarians discussing each book as it arrives, the books would be distributed automatically into the three collections according to a pre-determined formula. Another option is to continue the current arrangement of separate Bi-College and Swarthmore approval plans, but with coordinated profiles that would reduce the amount of automatic duplication.

Effective Faculty and Student Use of Cooperatively-Built Collections

An integrated collection for the three colleges is desirable only if it is readily useable by faculty and students, and if it provides them with a richer set of resources than they currently have available.

Browsing in Tripod. The concern most frequently raised by students and faculty about the unified collection concept was the loss of the ability to browse the shelves. Tripod

has a mechanism for looking at cataloging records in call number order, but it is neither easy to find nor easy to use. Significant improvements of this system will need to be a priority.

Enhancement of Cataloging Records. Even if browsing by call number in Tripod becomes easier, the lack of information contained in most cataloging records makes it difficult to determine if a book is worth consulting. In order to make Tripod a more effective tool, the libraries have been buying Table of Contents information to add to the cataloging records of new books. Currently this information is available only for books published since 1995. More enhanced cataloging information is available commercially, however, including tables of contents for books published between 1991 and 1995, book reviews, summary notes, and portions of first chapters. The libraries should purchase as much of this additional information as seems appropriate to make Tripod a reasonable alternative to physically browsing the shelves.

Catalog enhancements are currently available commercially only for books published fairly recently. If the libraries are going to eliminate duplicate copies of many older books, it will be important to find ways of helping faculty and students evaluate the remaining copies through Tripod. A possibility worth considering is digitally capturing the tables of contents, indexes, and first chapters of books that are being de-duplicated.

Expansion of the Range of Materials Provided. If we can reduce the amount of money spent on acquiring multiple copies of books, funds will become available to acquire a broader range of materials than the libraries are currently buying. To determine how this money should be spent, librarians will need to consult more closely with faculty to identify areas where the collections could be strengthened. Further studies of collection use will also help to indicate areas needing additional support. The most important measure of unmet need is the amount of borrowing the students do from PALCI and other libraries beyond the Tri-Colleges. Meaningful data on interlibrary borrowing was not easily available for this study, but further investigation is certainly warranted. The libraries should also pursue opportunities to compare their holdings with those of comparable libraries to determine areas of relative strength and weakness.

Key Findings

- Each of the libraries organizes its collection development activities in different ways, resulting in different approaches to collections and different methods of decision-making. In a collaborative environment, the libraries might look at adopting other models for organizing their work, including the model of the research university subject specialist.
- In the last few years, the libraries have developed a number of new tools for managing collection data and new structures for making Tri-College-level collection decisions. Additional tools and structures will be necessary as the scope of collaborative work increases.

- Large-scale, coordinated weeding projects appear to be an essential part of any long-term strategies for recovering library space. Undertaking such projects without weakening the overall quality of the collections will require careful communication among librarians and faculty, and, at least for a time, a central project staff to manage the process.
- Reducing the amount of duplication in new acquisitions has the potential to free funds to spend on materials not currently being acquired. Since a major portion of the libraries' book budgets are spent through approval plans, finding a way of coordinating these plans is critical.
- The greatest faculty and student concern about the move to an integrated collection is the loss of the ability to browse the shelves. The libraries will need to find methods of making the shelf browsing function in Tripod more useable, and of enriching the cataloging records so that virtual browsing is an acceptable substitute.