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ABSTRACT

An analysis of the science and technology collections at Carnegie Public Library of East Liverpool, Ohio was undertaken to obtain more thorough knowledge of these areas of the collection before collection development prioritization was made. The entire shelflist from Dewey classification number 500 through 629 was reviewed using the automated public access catalog, and data sheets were kept to record, for each title, class number, intellectual level (adult, young adult, or children's), whether the title was circulating or part of the reference collection, and a categorization into one of six date ranges for the age of the material. The data was input for analysis by SAS and frequency tables were printed based on the subject areas and the other variables recorded. The data reveals that for the survey sample as a whole, the subject areas of mathematics, physics, chemistry, and botany show noticeably fewer titles, while chemistry has the highest percentage of old materials. The data also provides a comparative overview of the subject areas and material age in relation to the adult, young adult, and children's collections, as well as to the circulating and reference collections. The conclusion is that although none of the data can be interpreted as absolute values for the strengths and weaknesses of the science and technology collections, the study provides a basis for determining key areas for improvement, as well as a foundation for conducting further qualitative assessment. Ten tables show percentages and distribution of titles. The sample data collection form is appended. (Contains 21 references.) (Author)

AN ANALYSIS OF THE SCIENCE AND TECHNOLOGY COLLECTIONS AT THE CARNEGIE PUBLIC LIBRARY, EAST LIVERPOOL, OHIO

A Master's Research Paper submitted to the
Kent State University School of Library Science
in partial fulfillment of the requirements
for the degree Master of Library Science

by

Thomas R. Marlatt

May, 1996

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An analysis of the science and technology collections at Carnegie Public Library of East Liverpool, Ohio was undertaken to obtain more thorough knowledge of these areas of the collection before collection development prioritization was made. The entire shelflist from Dewey classification number 500 through 629 was reviewed using the automated public access catalog, and data sheets were kept to record, for each title, the class number, intellectual level (adult, young adult, or children's), whether the title was circulating or part of the reference collection, and a categorization into one of six date ranges for the age of the material. The data was input for analysis by SAS and frequency tables were printed based on the subject areas and the other variables recorded. The data reveals that for the survey sample as a whole, the subject areas of mathematics, physics, chemistry, and botany show noticeably fewer titles, while chemistry has the highest percentage of old material. The data also provides a comparative overview of the subject areas and material age in relation to the adult, young adult, and children's collections, as well as to the circulating and reference collections. The conclusion is that although none of the data can be interpreted as absolute values for the strengths and weaknesses of the science and technology collections, the study provides a basis for determining key areas for improvement, as well as a foundation for conducting further qualitative assessment.

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CHAPTER 1

INTRODUCTION

The Carnegie Public Library of East Liverpool, Ohio, completed a three-year automation project in April, 1995, after having conducted a complete inventory to ensure the accuracy of the converted database. Having reached this point, the library is now ready to put more effort into the development of specific subject areas in the collection where there is need for more, as well as more up-to-date, material. As science and technology are two of the areas where information is constantly being updated, and also because the pure sciences have traditionally been viewed as being underrepresented in this library's collection, it was determined that an analysis of these two areas for the purpose of collection development, in both the immediate as well as medium-range future, would be beneficial. An appropriate and realistic plan for acquisition cannot be formulated without first having a thorough knowledge of the existing collection.

Collection evaluation may be performed for a number of purposes, some very specific and some much more general in nature. In his book, Developing Library and Information Center Collections, G. Edward Evans discusses the importance of conducting evaluations of library collections and lists some of the reasons for undertaking such a project. Evans makes it clear from the outset that this business of determining the value of books individually or collectively is rather subjective, and always affected by countless unmeasurable forces:

> A book's value, or an entire collection's, may be determined on several bases: economic, moral, religious, aesthetic, intellectual, educational, political, social, and so on. The value of an item or a collection can go up or down, depending on which base is used. Combining several bases generates questions of the respective weight (or equality) of each. The point is that so many subjective factors come into play in the evaluation process that it is essential to work through the issues before starting.[1]

As this library was sifting through some of its post-automation collection goals, there were several reasons for conducting an evaluation, among them these which are listed by Evans as "internal reasons": finding the strong areas of the collection; finding the weak areas of the collection; and gathering data for weeding projects; and, one which Evans describes as an external reason, "Is the collection too old?" (This also relates to the internal motivation of gathering data for weeding.) To begin with some type of compilation of statistics on holdings (George Bonn lists this as one of five general approaches to collection evaluation.[2]) seemed like a good way to begin the evaluation process. This would provide an idea of the actual state of the collection in physical terms (book counts within subject areas) and chronological terms. The library could later add information collected from a recently installed automated circulation system, as well as compare data from interlibrary loan, reference question logs, and possibly other user surveys, for a more comprehensive type of evaluation.

Purpose of the Study

The purpose of this study is to provide a statistical picture of the strengths and weaknesses of the science and technology collections. This includes information on subject areas

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[1]G. Edward Evans, "Evaluation," chap. in Developing Library and Information Center Collections (Littleton, Colo.: Libraries Unlimited, 1987), 311.

[2]George Bonn, "Evaluation of the Collection," Library Trends 22 (January 1974): 265-304.

with few or no titles; areas with titles of which the majority are obsolete; and comparisons of these collections at three intellectual levels (i.e., adult, young adult and children's). It also provides information on proportions of reference material to the general circulating collection within a specific subject, which could be very helpful in prioritizing areas to be developed.

It should be stated at the outset that some of the data comparisons to be made in this study, using the numeric data compiled, cannot be viewed as absolute values which indicate strengths and weaknesses of the collection. There are many factors which exert their influences on the different sections and on various characteristics of the collection, which may be legitimate reasons for variations in the data. Nevertheless, the data from this study will be helpful in that it will highlight areas where there are potential shortcomings; and as mentioned above, additional evaluation could provide further evidence of the most problematic areas.

CHAPTER 2

LITERATURE REVIEW

There is a significant body of literature relating to the evaluation of library collections. Much of this deals with qualitative assessment involving citation checking, expert review of titles held in the collection, and user or circulation surveys. There has been much less written on quantitative analysis, and in particular, the analysis of the subject areas of science and technology. Following is a discussion of the most relevant articles reviewed in a search of the existing library literature.

Carol Morrison et al., published a study in Illinois Libraries in 1994 which describes a survey of school libraries in which the librarians were asked to count titles within three predetermined subject areas and then give the number in that group which were published before 1970.[3] The survey analyzed the subject areas of astronomy, space and the solar system; general biology and ecology; and human anatomy, physiology and hygiene. The study analyzed various aspects of the school systems in relation to the obsolescence of their materials, including monetary resources, grade levels, and school sizes. The conclusion of the study was that the average school collection, at least in the subject areas specified, contained far too many obsolete items and not enough up-to-date information. Many of the participating respondents commented that

[3]Carol Morrison and others, "School Library Snapshots: a Brief Survey of Illinois School Library Collections in Three Areas of Science," Illinois Libraries 76 (Fall 1994): 211-219.

answering the survey was very useful to them because they hadn't realized exactly how bad the state of the collection was prior to doing this.[4] The article points out that this type of survey cannot take the place of detailed examinations of individual collections, and indeed it is this type of analysis which will be discussed in this paper.

Mark Sandler gives a discussion of issues relating to quantitative assessment in "Quantitative Approaches to Qualitative Collection Assessment."[5] The author emphasizes that doing citation checking to analyze the quality of a collection is often of limited value to specific collections since the variations in collection history and in library user bases create wide differences in what could or should be considered to be a useful or adequate collection. These studies involving citation checking require the establishment of an acceptable threshold percentage of items which are found in the collection, and this can be very problematic in that there is no specific formula for determining what indeed is an acceptable percentage. Sandler argues that a preferable evaluation method is to establish a design which "permits comparison within classes of items; i.e., variables."[6] This is the type of study which will be discussed in the present paper.

Sandler includes in his article a discussion of important factors to consider in planning such a quantitative assessment, for example, how to select a sample and how to plan coding of the data for efficient manipulation with computers. He stresses the importance of coding data with as much detail as possible, since this can always be collapsed into more general categories; whereas the converse is not true.

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[4]Ibid., 218.

[5]Mark Sandler, "Quantitative Approaches to Qualitative Collection Assessment," Collection Building 8, no. 4 (1989): 12-17.

[6]Ibid, 13.

All in all, Sandler describes such a quantitative approach to assessment as "a powerful collection management tool."[7] The conclusion of the article gives an important insight into the significance of carrying out such assessments:

> It seems certain that those who fail to move in the direction of systematic assessment will be unable to cope with the increasingly difficult questions that promise to confront collection officers in years to come. The profession as a whole needs to integrate the basic tools of statistical analysis in its package of librarian (and library) survival skills.[8]

In "Computer Techniques for Studying Coverage, Overlaps, and Gaps in Collections," Howard D. White presents some techniques for comparing the holdings of a number of libraries using a specific software, Statistical Package for the Social Sciences (SPSS).[9] Because it is so specific, it would be of limited use to individual libraries, but it does provide a model for doing analyses which would be used for cooperative collection development among several libraries.

Joseph J. Branin, David Farrell and Mariann Tiblin give an overview of the National Shelflist Count in their article, "The National Shelflist Count Project: Its History, Limitations, and Usefulness."[10] This was a project undertaken by the RTSD Chief Collection Development Officers of Large Research Libraries Discussion Group. It was a compilation of data which was obtained primarily through lineal measurement of the shelflists of participating libraries. Although the article outlines some of the limitations of the project, it also relates that a number of librarians found the data useful as indicators of growth rates and relative size of subject collections which

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[7]Ibid, 16.

[8]Ibid, 17.

[9]Howard D. White, "Computer Techniques for Studying Coverage, Overlaps, and Gaps in Collections," Journal of Academic Librarianship 12 (January 1987): 365-71.

[10]Joseph J. Branin, David Farrell, and Mariann Tiblin, "The National Shelflist Count Project: Its History, Limitations, and Usefulness," Library Resources & Technical Services 29 (October/December 1985): 333-42.

could be used to assist in budget allocations, and, additionally, could be used as collection evaluations for accreditation reports or for determining responsibilities in cooperative collection development projects. This information is good for an understanding of the applications for subject counts and how they can be used among several libraries.

In "The Young and the Ageless," Danny P. Wallace calls for the development of a methodology for systematic evaluation of aging library materials that will take into account the fact that different subject areas become obsolete at varying rates.[11] Wallace describes a project which was in progress at the time the article was written which would use data from OCLC to conduct age analyses on the complete holdings of ten selected libraries.

Rose Mary Magrill discusses various aspects of collection evaluation as they relate to different types of libraries in "Evaluation by Type of Library."[12] The author gives an overview of the differences in the approaches to evaluation among public, school, large academic, small- and medium-sized academic, special, and consortium libraries. Besides pointing out differences in emphasis related to the inherent nature of the types of collections and user populations, she also covers such factors as the organization and governance of the library, specific information needs which the evaluation data may fill, and time constraints in the form of deadlines or limited availability of staff-hours. In the discussion of public libraries, Magrill covers assessment through statistical measurements (subject distribution, age, circulation rates) as well as patron surveys.

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[11]Danny P. Wallace, "The Young and the Ageless: Obsolescence in Public Library Collections," Public Libraries 29 (March/April 1990): 102-105.

[12]Rose Mary Magrill, "Evaluation by Type of Library," Library Trends 22 (Winter 1985): 267-95.

She cites the Public Library Association's A Planning Process for Public Libraries as a good initial resource for planning an evaluation of the collection.

The following literature all deals specifically with evaluations of science or health technology collections.

Lee Ching-Tat describes a study which was carried out at the library of the Western Australian Institute of Technology in "Subject Collection Evaluation, Quantitative and Qualitative."[13] This study examined the strength of the collection in the subject area of social science by comparing the "publishing intensity" with the library's "collecting intensity" for a given year (1980). This was followed by a user needs fulfillment assessment, which made use of teaching staff opinion and loan statistics. While the author's experience in conducting this study may yield some useful fodder for contemplation while one is designing one's own evaluation project, this study was fraught with uncertainties of methodology and lack of participation. For example, in formulating the figures for "publishing intensity," the author states that, "to minimize the omission of any elusive items, any title remotely connected with some aspects of social work, as far as could be guessed from the title, was listed." This could have caused a considerable overestimation of the materials published which were actually relevant. In addition, less than fifty percent of the teaching faculty who were asked to evaluate sections of the collection responded. Nevertheless, the author's proposal for evaluating the collection in regard to satisfaction of user needs, which includes examination of circulation statistics and interlibrary loan requests, could be very helpful as an aid in designing one's own assessment.

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[13]Lee Ching-Tat, "Subject Collection Evaluation, Quantitative and Qualitative," Australian Academic & Research Libraries 17 (June 1986): 73-83.

In "Science Collections in Community College Libraries," Kate Bradley explains the participation of the Bellevue Community College in Washington in a regional assessment project.[14] This used a conspectus method of assessing what should be in the collection and then comparing the books actually on the shelves and in circulation. The conclusion of this study is that it was a successful method of evaluating the science collection.

"Collection Assessment of Biotechnology Literature," by Kathleen Kehoe and Elida B. Stein, describes how the science division of the Columbia University Libraries conducted an assessment of monographic literature in two subspecialties, biocatalysis and applied molecular biology.[15] Since the literature of the previous five years was of critical importance in these areas where the research is growing phenomenally, and the available bibliographies were at least four years old, the librarians first had to compile bibliographies by using LC subject headings to search the RLIN database; further, publishers' flyers for the current year were searched for any titles which didn't show up on RLIN; and, finally, current issues of selected biological journals were reviewed for publishers' advertisements. The Columbia holdings were then compared to the resultant list and titles not owned were identified. This provided not only a list of materials which would fill in the gaps of the collection, but also documentation of the need for additional funding to maintain such rapidly growing subject areas.

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[14]Kate Bradley, "Science Collections in Community College Libraries," College & Research Libraries News 50 (July/August 1989): 579-583.

[15]Kathleen Kehoe and Elida B. Stein, "Collection Assessment of Biotechnology Literature," Science & Technology Libraries 9 (Spring 1989): 47-55.

Terese Heidenwolf describes an assessment done at the University of Michigan's Public Health Library in "Evaluating an Interdisciplinary Research Collection."[16] This study used citation checking rather than a conspectus method for finding out how extensive the collection was in terms of research for interdisciplinary fields. One citation from each article in the 1991 volumes of five epidemiology journals was checked against the library's holdings to see if the library owned it. The analysis of items not owned included comparisons of English versus non-English publications and the format of the publications.

Other articles relating to collection development were also reviewed, and these focus mainly on how to develop policies and then implement them (see bibliography). These would possibly be of value when the results of this present study are used in making decisions about the development of the science and technology collections at Carnegie Public Library of East Liverpool.

[16]Terese Heidenwolf, "Evaluating an Interdisciplinary Research Collection," Collection Management 18, no. 3/4 (1994): 33-48.

CHAPTER 3

METHODOLOGY

Definition of terms

Carnegie Public Library of East Liverpool classifies its nonfiction materials by assigning numbers from the Dewey Decimal Classification schedules. For the purposes of this study, the science and technology collections are comprised of books with Dewey numbers from 500 through 629. This includes all materials in the area of science, and the general technology, medicine, and engineering sections of the technology collection.

The library maintains its nonfiction materials in three collections based on intellectual level or purpose: adult, young adult (YA), and children's. Additionally, each level includes a collection of reference materials which do not circulate; there is a substantial amount of adult reference material and smaller reference collections in both the children's and YA areas.

Procedure

The study of the science and technology collections was done through a bibliometric means of evaluating the collection. The library's MARC database was reviewed by using the browse function of the public access catalog, beginning with the first item classified as 500. Data forms with six records each were used to collect the information. Each record contains the

Dewey Decimal Classification number, as well as categorization in three other characteristics. In keeping with Mark Sandler's suggestion of coding the data with as much detail as possible, items were recorded to the level of section numbers (specificity to the ones' digit of the number, e.g., 501, 502, 503, etc.). Although the intention in the analysis was to categorize by Dewey division numbers (500, 510, 520, etc.), it was felt that recording to the level of the section numbers would still be quite manageable, and the data could be collapsed into the divisions when the analysis was performed. This would allow the library to subsequently examine specific subjects in greater detail if desired. The remaining three characteristics are level (whether the title is adult, YA, or children's); whether the title is circulating material or part of the reference collection; and the currency of the title, which is broken down into six categories for the title's age (2 years old or less, 3-5, 6-9, 10-14, 15-19, and 20 years old or more). Data was collected in this manner for 5372 titles (see appendix).

Once the paper records were complete, the data were then input into a computer using Kent State University's EDD program. The actual Dewey number was entered, followed by a numeric value for each of the other three characteristics: level (1 = adult, 2 = YA, 3 = children's); circulating or reference status (1 = circulating, 2 = reference); and currency (1 = 2 years old or less, 2 = 3-5, 3 = 6-9, 4 = 10-14, 5 = 15-19, 6 = 20 years old or more).

SAS was used to analyze the data. Frequency tables for each of the characteristics were printed for a general overview. Next, thirteen categories were created for the Dewey classification divisions (i.e., 500-509, 510-519, 520-529, etc.); these were labeled as DDC_CAT. Frequency tables for each of the other characteristics were then constructed for each of these 13 categories. Finally, the data was sorted by each of the other characteristics and frequency tables

for the remaining characteristics were constructed for each of these as well. Comparisons of the numbers and percentages in various data groupings could then be made, as will be explained in the following chapter.

CHAPTER 4

ANALYSIS OF DATA

View of the Data by Dewey Decimal Division

When the data was divided into categories representing the Dewey Decimal Classification divisions, this created 13 subject units to be analyzed: 500s, 510s, 520s, etc., through 620s. Titles are rather evenly distributed among these categories with the exception of three areas: the 590s, which contain 18.9% of the surveyed collection; the 610s, the largest category represented, with 30.4%; and the 620s, with 17.9%. It is not surprising that the health and medicine section would include the greatest number of titles; the disparity between the size of the other two and the remaining divisions is perhaps slightly more unexpected. Table 1 shows the distribution of the titles by Dewey division number.

When the level of the titles was examined within each Dewey division, there were no particularly outstanding areas of variation, with these exceptions: in the 530s, 550s, 560s and 590s there are substantially more children's items than adult. In the 560s, this is especially pronounced--87.8% of the material is in the children's collection, while only 11.5% is adult and 0.6% is YA. Although one would expect the subject area for dinosaurs to be rather high in the children's collection, the library might want to consider building the adult collection somewhat. Also of note from this analysis is the fact that there are no YA items in the 540s. This, then, is

Table 1

Distribution of Titles by Dewey Divisions

Dewey Division No.	f	%
500	270	5.0
510	110	2.0
520	267	5.0
530	135	2.5
540	62	1.2
550	227	4.2
560	156	2.9
570	326	6.1
580	142	2.6
590	1013	18.9
600	74	1.4
610	1631	30.4
620	959	17.9
Total	**5372**	**100.0**

another area for consideration. Finally, the 610s, health, show an especially high percentage in the adult portion of the collection. This is understandable because most of the issues pertaining to health are of a precise nature and the demand for this material is concentrated with adult users; additionally, health concerns relating to children are most frequently treated on the adult level since a parent or guardian is nearly always involved. Table 2 shows the percentages for each level within each of the thirteen subject areas examined.

Table 2

Percentages for Levels within Dewey Divisions

Division No.	Adult	YA	Children's	Total
500	51.5	3.3	45.2	100.0
510	53.6	14.5	31.8	100.0
520	47.6	3.0	49.4	100.0
530	34.8	5.2	60.0	100.0
540	67.7	0.0	32.3	100.0
550	38.8	2.2	59.0	100.0
560	11.5	0.6	87.8	100.0
570	54.0	3.4	42.6	100.0
580	47.9	1.4	50.7	100.0
590	32.2	0.5	67.3	100.0
600	68.9	8.1	23.0	100.0
610	79.2	7.9	12.9	100.0
620	58.9	5.3	35.8	100.0

When the percentage of circulating versus reference materials are examined within each Dewey division, five areas have at least 10% of the titles in the reference collection: 500s, general science, with 10.4%; 540s, chemistry, with 12.9%; 570s, general biology, with 10.1%; 580s, botany, with 10.6%; and 600s, general technology, with the largest percentage of reference material, 18.9%. This last large figure can be attributed mainly to the encyclopedic reference

works on invention and inventors, as well as titles on copyright and patent. Table 3 shows the complete listing of percentages for circulating and reference titles within the subject areas.

Table 3

Percentages for Circulating versus Reference within Dewey Divisions

Division No.	*Circulating*	*Reference*	*Total*
500	89.6	10.4	100.0
510	96.4	3.6	100.0
520	97.8	2.2	100.0
530	96.3	3.7	100.0
540	87.1	12.9	100.0
550	99.1	0.9	100.0
560	99.4	0.6	100.0
570	89.9	10.1	100.0
580	89.4	10.6	100.0
590	97.5	2.5	100.0
600	81.1	18.9	100.0
610	96.0	4.0	100.0
620	91.0	9.0	100.0

When the currency categories are examined within each subject area, there are two places where the figures vary from the norm. First, the 560s category, paleontology, has fewer items which are 15 or more years old, with a much heavier weighting for the entire 9 or fewer

years old categories than any other Dewey division. Second, the 540s category, chemistry, has a glaringly high 51.6% of its materials being 20 or more years old. Table 4 gives the complete listing of percentages for each currency (or age) category within each of the subject areas.

Table 4

Percentages for Currency Categories within Dewey Divisions

Division	*<1-2 yrs*	*3-5 yrs*	*6-9 yrs*	*10-14 yrs*	*15-19 yrs*	*= or > 20*	*Total*
500	8.1	15.6	20.4	10.4	7.8	37.8	100.0
510	5.5	25.5	19.1	10.9	9.1	30.0	100.0
520	11.6	22.1	28.1	12.4	8.6	17.2	100.0
530	11.9	22.2	23.0	11.1	5.9	25.9	100.0
540	4.8	14.5	9.7	12.9	6.5	51.6	100.0
550	9.3	15.4	21.1	15.4	6.2	32.6	100.0
560	15.4	17.3	41.0	16.7	1.9	7.7	100.0
570	8.9	14.4	21.5	8.9	8.9	37.4	100.0
580	9.2	19.0	14.8	14.8	6.3	35.9	100.0
590	12.7	19.9	21.4	10.2	8.5	27.2	100.0
600	9.5	20.3	20.3	9.5	12.2	28.4	100.0
610	12.8	17.2	26.7	17.5	11.2	14.7	100.0
620	10.4	16.4	21.4	16.9	9.5	25.4	100.0

View of the Data by Level

If the survey sample of citations is divided into the three levels first, and then analyzed for the other characteristics, this can yield additional useful information. Rather than showing how the levels relate with respect to the other levels in a particular subject, this gives a picture of what quantity of a specified level's material is contained in each subject area (or other variable). For the entire sample, the percentages for each level are as follows: adult, 55.8%; YA, 4.7%; and children's, 39.6%. When the Dewey decimal divisions are analyzed in this manner, again there are few outstanding variations among the levels. The exception is that in the children's collection there is a much larger percentage of materials in the 590s (zoology) collection than in either adult or YA. Conversely, while in both the adult and YA collections a large percentage of the materials are contained in the 610s, in the children's collection this is not so. Table 5 shows the percentages of the total items within a given level for each of the Dewey divisions.

Looking also at reference versus circulating items in each level, the adult collection is 8.1% reference with the remainder circulating; YA is 2.0% reference; and the children's collection is 2.2% reference. Finally, the currency of each level was examined. The YA collection has by far the highest percentage of new materials, with 93.6% having been published within the last 10 years. The figures for this date range for adult and children's are 42% and 63.1%, respectively. The adult collection has more materials in the oldest category (20 years old or older), with 30.9%.

View of the Data by Reference/Circulating Status

Examining the data sorted by citations for circulating items and reference items, one can view the concentrations of material as well as areas where it is lacking for either of these two

Table 5

Percentages by Subject within Each Level
(% of all titles in each level)

Division No	Adult	YA	Children's
500	4.6	3.6	5.7
510	2.0	6.4	1.6
520	4.2	3.2	6.2
530	1.6	2.8	3.8
540	1.4	0.0	0.9
550	2.9	2.0	6.3
560	0.6	0.4	6.4
570	5.9	4.4	6.5
580	2.3	0.8	3.4
590	10.9	2.0	32.1
600	1.7	2.4	0.8
610	43.1	51.6	9.9
620	18.9	20.4	16.1
Total	**100.0**	**100.0**	**100.0**

collections. For the entire sample, the circulating collection makes up 94.5%, with reference materials being the remaining 5.5%. The percentages within each Dewey division are fairly similar with the exception of the 590s, zoology, in which 19.5% of the circulating materials fall; only 8.5% of the surveyed reference collection falls into this subject category. Table 6 shows the Dewey division percentages for both the entire circulating and entire reference collections.

Table 6

Percentages by Subject within Circulating and Reference Collections
(% of titles in each portion of the collection)

Division Number	*Circulating*	*Reference*
500	4.8	9.6
510	2.1	1.4
520	5.1	2.0
530	2.6	1.7
540	1.1	2.7
550	4.4	0.7
560	3.1	0.3
570	5.8	11.3
580	2.5	5.1
590	19.5	8.5
600	1.2	4.8
610	30.8	22.5
620	17.2	29.4
Total	**100.0**	**100.0**

Looking at levels within the circulating and reference collections, the circulating collection is 54.2% adult material, 4.8% YA and 40.9% children's; the reference collection is 82.6% adult, 1.7% YA and 15.7% children's. When the currency of the two areas is examined, it is found that, in the circulating collection, 28.3% is 6 or fewer years old and 51.5% is 10 or fewer years old, while 24.7% is at least 20 years old. In the reference collection, 44.8% of the material is 6 years old or less and 74.6% is 10 years old or less, while only 11.6% is at least 20 years old.

Tables 7 and 8 show the percentages in the circulating and reference collections for level and currency, respectively.

Table 7

Percentage by Level within Circulating and Reference Collections
(% of titles in each portion of the collection)

Level	*Circulating*	*Reference*
Adult	54.2	82.6
YA	4.8	1.7
Children's	40.9	15.7
Total	**100.0**	**100.0**

Table 8

Percentage by Currency within Circulating and Reference Collections
(% of titles in each portion of the collection)

Age by publication date	*Circulating*	*Reference*
2 years or less	10.8	21.2
3-5 years	17.5	23.6
6-9 years	23.2	29.8
10-14 years	14.5	9.6
15-19 years	9.4	4.1
20 years or more	24.7	11.6
Total	**100.0**	**100.0**

View of the Data by Currency Category

In this final view of the data, the entire survey sample is divided into the six categories for the publication date of the citation. Adding the percentages for the three most recent categories shows that 53.7% of all the sampled items are 9 or fewer years of age; however, the category for items 20 years old and older is the largest single portion, having just slightly more than the 6-9-year-old category. Table 9 shows the complete list for the entire sample.

Table 9

Distribution of Titles by Currency Categories

Age by publication date	*f*	*%*
2 years or less	609	11.3
3-5 years	959	17.9
6-9 years	1264	23.5
10-14 years	764	14.2
15-19 years	489	9.1
20 years or more	1286	23.9
Total	**5372**	**100.0**

Next, the percentage of each date group falling into each of the Dewey divisions is examined. As opposed to viewing the percentages of the currency categories within each division (which gives a picture of the quantities relative to the rest of that subject), this view shows in which subjects the most and least amounts of materials of a given age can be found. When these

figures, shown in Table 10, are compared with the general title distribution percentages from Table 1, there are no outstanding variations from what would be expected.

Table 10

Percentages for Dewey Divisions within Currency Categories

Division	*≤ 2 yrs*	*3-5 yrs*	*6-9 yrs*	*10-14 yrs*	*15-19 yrs*	*≥ 20 yrs*
500	3.6	4.4	4.4	3.7	4.3	7.9
510	1.0	2.9	1.7	1.6	2.0	2.6
520	5.1	6.2	5.9	4.3	4.7	3.6
530	2.6	3.1	2.5	2.0	1.6	2.7
540	0.5	0.9	0.5	1.0	0.8	2.5
550	3.4	3.6	3.8	4.6	2.9	5.8
560	3.9	2.8	5.1	3.4	0.6	0.9
570	4.8	4.9	5.5	3.8	5.9	9.5
580	2.1	2.8	1.7	2.7	1.8	4.0
590	21.2	21.1	17.2	13.5	17.6	21.5
600	1.1	1.6	1.2	0.9	1.8	1.6
610	34.2	29.3	34.5	37.3	37.2	18.6
620	16.4	16.4	16.2	21.2	18.6	18.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The preceding profile of the data has provided information about specific areas where there may be either too few titles or too many outdated titles. The following chapter will outline some specific measures the library may take based on this information.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The statistics from the data analysis reveal several areas in the science and technology collections that the Carnegie Public Library of East Liverpool may want to address with weeding and updating. These areas follow below.

Development by Subject

Examining the comprehensive percentages of titles by Dewey division, the library may want to consider specifically developing those areas where low percentages occur: 510s, mathematics; 530s, physics; 540s, chemistry; and 580s, botany. There is a similarly low percentage in the 600s, but as this is a division for the generalities of technology, it is probably not an indication of insufficient material.

Within specific levels, the absence of YA material in the 540s is certainly a problem which must be corrected. Also, the fact that 87.8% of 560s material, paleontology, is in the children's collection may be a signal of a collection gap. The children's dinosaur books previously mentioned notwithstanding, there is still probably a lack of sufficient adult material.

In regard to reference materials, there are low percentages in the comprehensive breakdown in the 550s, earth sciences, and 560s, paleontology. The reference librarian may want to review these areas and compare this finding with the logs of reference questions asked.

Finally, as for the age of the materials within subject areas, the data reveals that the 540s category, chemistry, has the lowest percentage of very current materials (two years old or less), while at the same time it has the highest percentage of items twenty years old or older. This area will need to be weeded and developed consistently over the next few months. The 510s category, mathematics, also has a low percentage of very current items.

Development by Level

The comparison of the percentages of subject divisions within each level shows that there are two areas with much higher disparity: the 590s, zoology, where the children's collection has a much higher percentage; and the 610s, medicine, where the children's collection figure is much lower. It would be expected to be somewhat lower than the adult collection, but the fact that it is 33.2 percentage points below the adult figure, and 41.7 percentage points below the YA figure, means that this area probably needs some additional titles.

As reported in the analysis chapter, the adult collection has more materials having publication dates twenty or more years old than either the YA or children's collections (30.9% of the adult collection). Thus, weeding and updating of the adult area should take precedence over the children's and YA collections.

Development of Reference Collection

The comparison of the relative amounts of the circulating and reference collections which are devoted to a particular subject area may indicate an area for special development. Since the needs for reference type materials may vary greatly from subject to subject, this analysis may be of limited use; however, since the 590s, zoology, is a subject often used for biology

assignments from surrounding schools, the disparity which shows in this subject may indicate an area needing attention.

The reference collection is far more weighted with adult materials than is the circulating collection. This is probably as it should be, as the reference needs in that area far outweigh the others.

Finally, in the analysis of reference development, the currency percentages show that the reference collection is substantially more up-to-date than the general circulating collection. While only 11.6% of reference items are twenty or more years old, in the general collection 24.7% fall into that category.

As there were no significant variations in the tables based on item currency, there are no specific recommendations to be made from this data.

There are further steps which could be taken in regard to the entire sample of subject areas, and to the above-mentioned areas in particular. As suggested in some of the literature, circulation statistics for the Dewey divisions could be compared with the basic percentages of items within each division to see how closely they correlate. If there were any areas where there was a high circulation, but the percentage of items was relatively low, then the library might want to consider building those areas to some degree. Also, the currency figures for those areas with high circulation could be examined, and higher circulation in areas with only average or less than average percentages of the most current materials would signal areas for further development.

An examination of interlibrary loan requests could also be compared with the results of this analysis. Although higher rates of requests in certain areas could be construed as indicators

for development in and of themselves, a comparison with the weaknesses shown in the data here might further underscore the needs of particular areas and aid in prioritization.

Finally, a review of the reference question logs could be compared with the data concerning the reference collection to find where there might be justification for more material than that currently reflected by the subject percentages within the reference collection.

It remains to be seen whether the library will conduct further evaluation, and if it does, what the extent of that evaluation will be. If additional assessment is performed, then this study could be an important basis for that portion concerning the science and technology collections and their future development.

APPENDIX -- Sample Data Collection Form

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
				92-90	____
	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
				92-90	____
	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
				92-90	____
	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
				92-90	____
	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
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	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

DDC	**Level**		**Ref/Circ**	**Currency**	
____	Adult	____	Circ ____	95-93	____
				92-90	____
	YA	____	Ref ____	89-86	____
				85-81	____
	Children's	____		80-76	____
				75-	____

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