LIBRARY HUMAN RESOURCES

A Study of Supply and Demand

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A report prepared for the National Center
for Education Statistics
and the Office of Libraries and
Learning Technologies by
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FOREWORD

It is almost impossible to overstate the value of a library to the community it serves. Knowledge is critical to the success of any society, especially a democratric society in which informed citizens are crucial to its flourishing and its very survival. The local library serves our people as a fountain of knowledge — an important resource to the community and all the people within it.

Public libraries were established as part of a major reform movement to bring knowledge within the reach of all citizens. Thousands of public-spirited citizens have been responsible in recent years for making library services a reality for all. During the past three decades, a variety of programs supported by the Federal government have provided greater access for more people to library materials. Presently 96 percent of our population has access to library materials, which are made available by walking or driving to the local library, or enjoying materials by a bookmobile or mobile van or through the variety of new technologies which have been introduced in libraries throughout our country. Resource sharing and networking have reduced costs and prevented unnecessary duplication while bringing important resource materials to millions of people.

There is no age limit for people wishing to benefit from the library's storehouse of information. It serves preschoolers through movies, story times, and beginning reading books. A library is an important supplement to the school child from the elementary through postsecondary years. And even more crucial, it serves as a life-long resource for adult learning.

Every nation should have as its goal the building of a learning society, and a library plays a crucial role in accomplishing this objective.

Library Human Resources: A Study of Supply and Demand was jointly funded and coordinated by two components of the Office of Educational Research and Improvement, U.S. Department of Education -- the National Center for Education Statistics and the Office of Libraries and Learning Technologies. It offers very important research information in assessing future personnel needs for our nation's libraries. It is my sincere hope and expectation that the results of this study will assist states and localities in their budget planning processes to ensure that the expenditures deemed necessary to strengthen libraries will be effectively and efficiently allocated. The study should assist in focusing on new personnel needs as libraries meet the challenge of the Information Age. It is important to maintain quality library services throughout the nation, and communities should give their libraries a priority commensurate with the value they assign such a function. The strength of our nation and the advancement of its intellectual heritage are ultimately tied to the strength of our libraries.

Educational experts have lamented that the age of television has diminished the enthusiasm people traditionally have had for books. Libraries serve as vigilant guardians of our civilization's knowledge and history in a print form, and remind us that the electronic media should help us supplement -- not supplant -- books as the core for knowledge. This study reminds us that just as the teacher is crucial to the school to bring lessons to life, the librarian is crucial to the operation of the library. Well qualified and trained librarians serve to increase the impact of the library as a knowledge resource for the community. Libraries serve to quench the thirst for knowledge, and our national survival depends on a healthy and vibrant library system always providing stimulus for the minds of our people.

Donald J. Senese
Assistant Secretary for Educational Research
U.S. Department of Education

PREFACE

Change is inevitable; all that is uncertain is its rate. In this time of rapid change in the library and information service environment, it should follow that the demand for personnel resources will also change. This study reflects the results of an investigation of the magnitude of change in the employment of librarians, projected through 1990.

The last such study was reported in the 1975 publication Library Manpower: A Study of Demand and Supply, prepared by the Bureau of Labor Statistics for the U.S. Department of Education's National Center for Education Statistics (NCES) and Division of Library Programs. That study was conducted in response to a waning demand for librarians in the early 1970's following a period of shortage in the late 1960's. The current study comes at a time when the demand in terms of traditional librarian positions grows slowly but when additional growth is anticipated in non-traditional information professional positions. Significant changes appear imminent, and the current study provides a baseline from which to measure those changes.

This project was funded by the NCES and the Office of Libraries and Learning Technologies (OLLT) of the U.S. Department of Education. The request for proposal was written by NCES with the assistance of the Bureau of Labor Statistics, and NCES conducted the study. King Research, Inc. was the study contractor. Project officers for the study were Helen Eckard of NCES and Robert Klassen of OLLT.

In acknowledging the contributions of the many participants in the project, it is only fitting to begin with Ms. Eckard. As the primary Project Officer she was heavily involved at all stages. From the writing of the RFP onward, she molded the basic study concept and then managed its diverse components. She faced each new obstacle in our path squarely, with a determination to overcome, and was an unfailing source of support and counsel to project operations.

Numerous others also played a role in the study. The Planning Committee, comprised of J. James Brown (National Science Foundation), Anne Kahl (Bureau of Labor Statistics), and Margaret Myers (American Library Association), provided invaluable comment and support. In addition, other individuals throughout the library and Federal statistical communities provided helpful data and ideas. The LAMA Statistics for Personnel Committee of the American Library Association, chaired by Richard E. Willson, reviewed the draft report. We are grateful to all of the many individuals who worked with us, and of course to all of the libraries and library schools who cooperated in both the pretest and full scale surveys.

At King Research, Nancy A. Van House was the initial Project Director and was responsible for much of the early conceptualization and design effort. When she moved to a faculty position at the School of Library and Information Studies, University of California Berkeley, Dr. Van House continued as a project consultant and worked particularly on the modelling of supply in the form of new library program graduates. Other project consultants included Michael D. Cooper, University of California Berkeley, and Jack Rutner, Joel Popkin and Associates. Dr. Cooper was involved throughout the study with projecting employment of public, school, and academic librarians and Dr. Rutner provided methodological support. Research assistance was provided at UC Berkeley by Louise Anderson, Julie Butterfield, Karen Watkins, Kitty Whiteside, and Gloria Yun.

Other KRI staff members working on the project included Vernon E. Palmour, Donald W. King, Joan Foley, Helen Kurtz, Colleen Schell, and Ellen Sweet. The extensive survey operations were coordinated by Ms. Sweet and Mrs. Kurtz, and Mr. King served as project statistician, working with Abraham Frankel of NCES. Data processing was done by Joan Bull of Westat, Inc.

Nancy K. Roderer
Project Director

EXECUTIVE SUMMARY

The Library Human Resources Study was designed and undertaken to project the supply and demand of professional librarians through 1990. These projections will serve as sources of input into the decision-making processes for government policies and programs in education for librarians, library services, and library research. They will also serve as an information device for librarians, library educators, library employers, and potential labor market entrants, especially in terms of providing an early warning system for library labor market imbalances, to reduce supply-demand adjustment problems.

The study required a description of the current library labor market, including its dynamics and the sources of suppply and demand; estimation of the sizes of the current supply and demand and their rates of change; and forecasting of the market into the future. Methods used included an extensive literature review to identify existing data, the collection of new data by means of two surveys, and the development of regression models to project future suppply and demand.

The surveys conducted were addressed to library schools and to libraries as employers of librarians. The Library School Survey, which was sent to all of the approximately 275 library education programs identified, covered applicants, admissions, completions, and placement of graduates from 1977/78 through 1980/81. The Employer Survey was sent to a sample of 2,335 of the estimated 43,600 libraries in the United States. It covered number of employees by type, the sex and educational status of librarians, and information on transfers into and out of the library. Numbers of employees were obtained over the 1978-1982 period and the remaining data were obtained for 1981 or 1982.

Forecasting models were developed using a variety of methods as appropriate to the data available. To project library employment, public,

academic, school (public and private), and special libraries were examined separately. Regression models incorporating relevant variables for each library type were developed and were fit to historical data and then used to predict future demand. To project the new supply of librarians coming from library schools, models based on Freeman's theory of occupational choice were developed. The approach used relies on multiple regression models in which supply is related to salaries, and salaries to market conditions. Other aspects of the supply and demand of librarians were projected based on current data and historical trends where available.

The study provides a clear picture of the current employment situation in libraries. In 1982, there were approximately 136,000 full time equivalent librarians employed in libraries, with 48 percent employed in school libraries, 23 percent in public libraries, 15 percent in academic libraries, and 14 percent in special libraries. Librarians made up about 45 percent of total library staffs, with 5 percent being other professionals and 50 percent technical, clerical and other support staff. About 80 percent of employed librarians had some sort of library degree or certification, with the majority having an MLS degree. Individuals with BLS degrees made up about 12 percent of all employed librarians, and those with school library certification but no library degree accounted for about 7 percent of the total.

Some 23,000 librarians were hired and about 17,000 left libraries in 1981. About 34 percent of those hired came from academic programs, while 44 percent came from other library employment. Twenty-two percent came from other kinds of employment or were previously unemployed. Of librarians leaving libraries, 37 percent went on to library employment, 15 percent to other employment, and 48 percent retired, returned to school, became unemployed and so on. About 4 percent of those hired came from non-library information professional positions, and about 9 percent of those leaving went to this type of position.

Looking at the current library school picture, we find that there were about 4,200 graduates of accredited MLS programs in 1980/81, 800

graduates of nonaccredited MLS programs, 300 graduates of BLS programs, and 1,700 individuals who completed preparation for school library certification without receiving a library degree. Of the total of approximately 7,000 graduates, about 80 percent went on to library employment, about 4 percent to information professional employment, 6 percent to other employment, and 10 percent to student or unemployed status.

Study projections show the overall supply and demand situation through 1990. On the demand side, the number of positions in libraries is expected to increase modestly into the early 1980's and then level off through 1990. Thus the decade of the 1980's is expected to show an even smaller increase in librarian employment than the rather stable 1970's, with no anticipated return to the boom period of the 1960's. Employment in school libraries is projected to decrease from 63,000 librarians in 1980 to 60,000 in 1990, primarily due to the decline in school enrollments. Following a period of slight increases, decreases are also expected in academic library staffing with about 20,000 academic librarians projected as employed both in 1980 and 1990. Public library employment in the 1980's is anticipated to increase from 30,000 in 1980 to 35,000 in 1990, and special library employment should also increase, growing from about 18,000 in 1980 to 23,000 in 1990. In total, librarian employment is estimated at 131,000 in 1980 and projected to be 138,000 in both 1985 and 1990.

As the number of jobs stays fairly constant in the 1980's, the number of individuals completing library education programs and seeking employment is also projected to remain fairly constant through the decade. MLS degrees from accredited programs are expected to reverse their decline of the 1970's and begin to increase again, but not rapidly; by 1990 their number will be the same as in 1969. MLS degrees from nonaccredited programs will follow the same pattern. School library certificates and BLS's, however, will decline steadily, offsetting the increase in the other areas. By 1990, our projections indicate that the mix of library program completions will have changed from 59 percent for accredited MLS programs to 73 percent.

The effect of the employment patterns anticipated is that most job openings created in the 1980's, especially in the latter part of the decade, will occur as a result of retirements and deaths rather than new positions. The number of job openings, like the number of graduates entering the labor force, will increase slightly and then decrease.

While the trends are expected to be similar for employment and graduates, the rates of change in the two differ sufficiently that it is anticipated that the job market will first continue to improve over the situation of the late 1970's and then, in the latter part of the period, again decline. This statement reflects the job market for traditional librarians, and could be counteracted by increasing movement of library program graduates to non-library information professional positions.

The non-library information professional market is intriguing, but little information is available. This study increased what is known about this market, but much remains unknown. The major difficulties are that it is a new market for library program graduates, so that we have little past information and no idea of how far librarians have penetrated into this potential market; and that it is a market with fluid boundaries, employing graduates of library, business, and computer science programs, who are competing for many of the same jobs, making it impossible to project the number of jobs that will be filled by librarians.

CHAPTER 1

INTRODUCTION

1.1 Purpose of the Study

The purpose of this study was to project the supply and demand for professional librarians through 1990. Developing these projections required a description of the current library labor market, including its dynamics and the sources of supply and demand; estimation of the sizes of the current supply and demand and their rates of change; and projection of the market into the future.

Library human resources projection serves three functions: (1) as a tool for evaluating and providing direction for government policies and programs in education for librarians, library research, and library services; (2) as an early warning system for library labor market imbalances, which may reduce adjustment problems; and (3) as an information device for librarians, library educators, library employers, and potential library labor market entrants.

Recent changes in librarianship make this study particularly necessary at this time. From the 1960's to the 1970's, the library labor market changed from a shortage of librarians to an excess of them, catching librarians and library educators by surprise. More recently, demographic and economic developments, such as the declining school-aged population and tax limitation measures, have affected the demand for personnel in education and public services generally, and in libraries specifically. Recent technological changes in libraries, such as the widespread automation of cataloging and proliferation of multi-type library networking, also have implications for the number of individuals demanded and the skills that they will need.

Perhaps the most significant recent development in librarianship, however, has been the movement of librarians into nonlibrary positions. Within the profession there is a growing recognition that, on the one hand, traditional job opportunities for librarians are in short supply, while on the other hand, their information skills are of use in a variety of settings. Librarians are assessing the transferability of their information skills. Library schools are beginning to broaden their curricula to cover management of information in other-than-library settings. This trend toward information management could have important implications for the number and kinds of jobs available to the graduates of library training programs.

Other developments have affected the pool of librarians available. Women's labor force participation has skyrocketed in the last decade, which is of great importance to a profession in which women are a majority. If more librarians are remaining in the labor force for a larger proportion of their working years, fewer people will be needed to replace them. On the other hand, the educated women who have traditionally been the mainstays of the library profession are moving increasingly into a wider variety of occupations, which may reduce the number in the library profession.

The major product of this study is quantitative projections of librarian supply and demand. In developing these projections, however, other kinds of information of use to the library community and library researchers have been compiled and reported. The existing data on the library labor market have been identified, as have the missing pieces, and some of the missing information has been collected. A model of the library labor market which identifies and quantifies the sources of supply and demand and describes their dynamics has been developed. The study has also included the identification of methods of projecting librarian supply and demand appropriate to the information available, the precision needed at each step, and the social and economic factors that affect the market for librarians. Finally, these projections have been combined into an overall assessment of future librarian supply and demand. The model and the projection methods can be used to replicate this research; to develop projections for a segment of the library market, such as a state; or to refine and

modify projections over time to account for changes in social and economic conditions or in the data available. The identification of the factors that affect the market also pinpoints areas that need to be monitored to anticipate changes in the market.

1.2 Definition and Scope

This study is concerned with the market for professional librarians. The traditional library labor market consists of librarians; libraries, which employ them; and library schools, which educate them. Traditionally, this market has been relatively closed: most people employed as librarians have had Master of Library Science (MLS) degrees or the equivalent, and most MLS-holders have been employed in libraries. Because in the past there was a shortage of trained librarians, however, not everyone currently working as a librarian has a library degree, so this study is not limited to consideration of MLS recipients. Librarians are therefore defined by what they do rather than by their educational backgrounds. (This is consistent with the earlier Bureau of Labor Statistics (BLS) study of library human resources [233].)

Specifically, a librarian is defined as a library staff member doing work that requires professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect. A library is an organization which maintains and controls an organized collection of printed materials, other graphic materials, and/or nonprint media; provides a regular staff which acquires and organizes materials, facilitates use of the collection, and delivers services to the library's clientele; and maintains an established schedule in which the services of the staff are available to the clientele.

Libraries, however, are not the only market for graduates of library education programs, and would-be librarians are not the only students who enroll in such programs. With the contraction of the library labor market during the 1970's and the growing importance of information in business, individuals with professional library training are increasingly

employed in non-library positions, especially in the private sector, which make use of their information skills. Many of these are librarians who have found other employment as an alternative to libraries. Some, however, are people with no interest in working in libraries who have found that library schools can provide them with the skills they need for other kinds of employment.

Two definitions of "information professional" are used in the literature. In a general sense, the term refers to all people who work with information. By this definition, librarians are one subset of information professionals. The other definition refers to a category that parallels librarians but includes only people working with information in non-library settings. For this project, the first, more general definition is used in order to stress the similarities between information professionals in library and non-library settings. The term "non-library information professional" is used to refer to those using information skills in settings other than libraries.

The development of the information professional has been a major change in the library profession, and has taken place during the last decade. The magnitude of its effect on librarianship and library education remains to be seen, but it is something that must be considered in any discussion of the library profession.

Quantitative projections, however, require a relatively constrained supply and demand. When jobs can be filled by librarians or by people with other kinds of education, as is the case with non-library information professional positions, both the array of jobs available and the group of people qualified to fill them are too fluid to be able to make solid projections. One can only speak of the number of jobs that might be available to librarians. Furthermore, employers are only beginning to become aware of the potential uses of graduates of library education programs, so that even identifying positions in which library education would be of use is difficult. Quantitative projections in this study, therefore, are limited to librarians in library positions, but a qualitative evaluation of the potential non-library market for graduates of library programs was performed.

In addition to librarians, libraries employ technical and clerical workers and professionals who are not librarians, such as computer specialists, archivists, curators, etc. The supply and demand for library personnel other than librarians was not projected. Without specific educational requirements, such as the MLS, the supply of non-professional library personnel is virtually infinitely elastic; requirements vary, but usually anyone with a high school diploma is a potential library worker. For comparable reasons, the supply and demand for professional library personnel who are not librarians has not been included in this study.

Figure 1 describes the library labor market as defined for this study. The sources of demand for librarians are various types of libraries plus non-library information professional positions. Sources of supply include library school graduates plus individuals with library education not currently in the library labor market. From this pool, additions to the supply of librarians will be those library school graduates who actually enter the library labor market, reentrants, delayed entrants, and occupational transfers. In addition, reductions in the current supply created by deaths, retirements, other labor force departures, and occupational transfers create a demand for librarians to replace those leaving the profession. Unless there is a shortage of librarians, additions to supply will equal demand.

This study employs standard labor market terminology and definitions. All individuals are either in the labor force or not. Because a person's intent cannot be measured, individuals are classified by their actions. To be in the labor force is to be employed or unemployed, that is, not employed but actively seeking work. Anyone not employed and not actively seeking work is out of the labor force, whether he or she is a full-time student, retired, out of the labor force due to family responsibilities, or simply not interested in seeking work, temporarily or permanently. When someone out of the labor force begins to seek work, he or she is said to enter the labor force. If the person was in the labor force, left, and then returned, he or she is a reentrant.

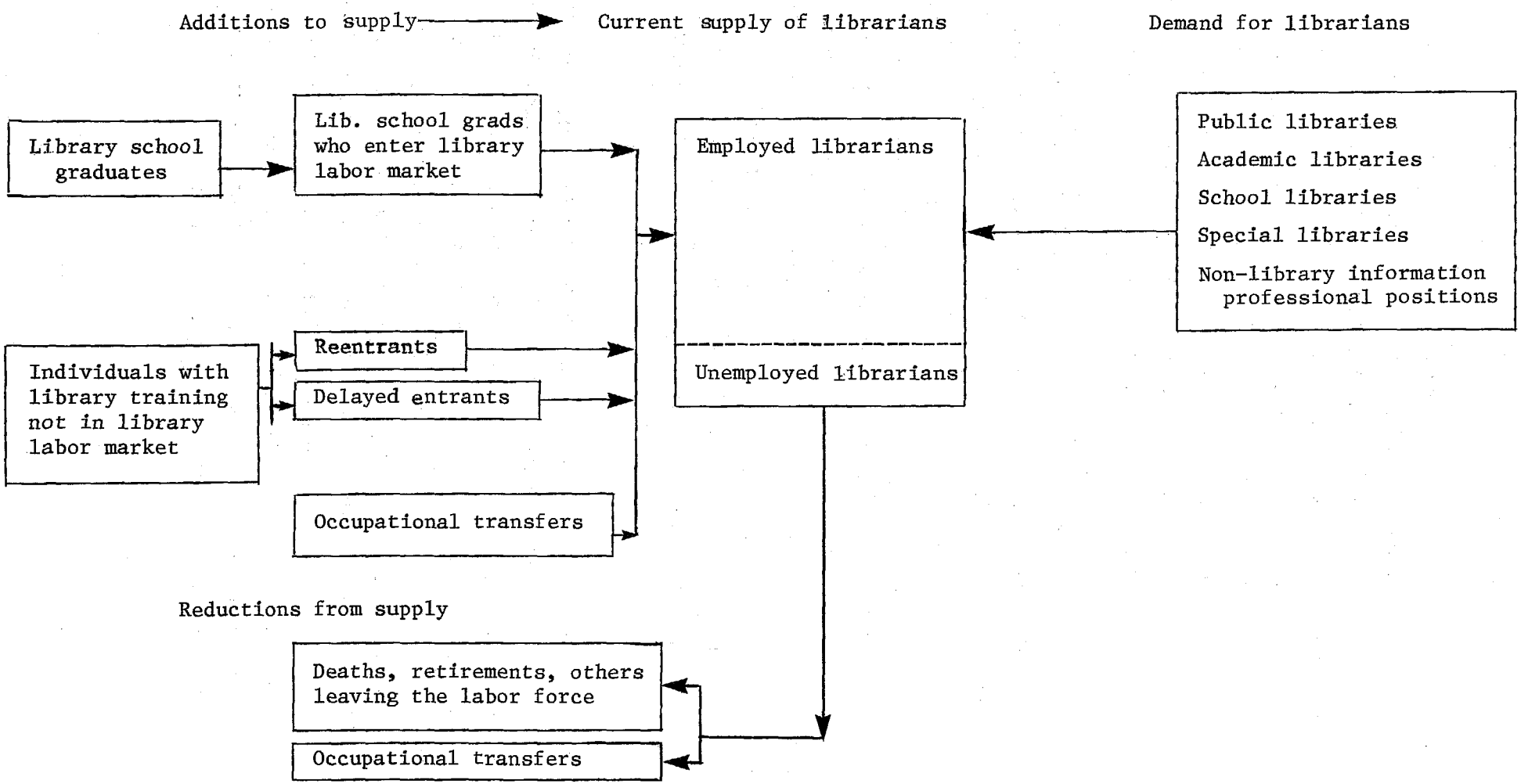

Figure 1. Library Labor Market

The same definitions are applied to occupational employment. A person is in an occupation if he or she is employed in it or unemployed and actively seeking work. Unemployed librarians are those with no employment, in libraries or elsewhere, who are seeking employment. If someone takes a job in another field, she or he has left the occupation. In fields like teaching and librarianship, where many people are unable to find jobs in the field of their choice but do find another kind of job, measuring the labor force is particularly difficult. It is not possible to distinguish those who have taken a lternative employment but would reenter the occupation should a job become available from those who have chosen a new occupation with no intention of returning. As a result, those people with library training or experience who are employed in other occupations cannot be counted as unemployed librarians. The term "reserve pool" has been applied to these individuals who could potentially reenter an occupation, but measuring the reserve pool is very difficult because it is not known how many of those with library training would actually reenter the profession, given the opportunity.

Underemployment is a problem, not only in librarianship, but in the labor force as a whole, but it is extremely difficult to identify and to measure. Underemployment consists of people working fewer hours than they would like (e.g., someone who wants to work full-time but can only find a part-time job), or employed in jobs that do not make use of or pay commensurate with their skills, training, and/or experience. Underemployment among librarians would include those with library training who wish to work as librarians but are working in non-professional library positions or in other occupations (as in the reserve pool concept) under the conditions listed above.

1.3 Existing Data on the Library Labor Market and Library Education Programs

Historical and current data on the employment of librarians are available from a number of sources. Coverage is not complete, however, and the various sources differ in how they define their data elements and in the time periods covered. The major sources of data are the Bureau of the

Census, Bureau of Labor Statistics, and the National Center for Education Statistics. In addition, professional associations collect some data from certain segments of the library labor market, and some researchers have collected and analyzed data of use to this project.

The most comprehensive data source, in terms of numbers of individuals included, is the decennial Census of Population. It collects data on individuals, including their occupations, incomes, and demographics. Unfortunately, the results of the 1980 Census were not available in enough detail in time for this project, and the 1970 Census is now rather old. The other major difficulty with the Census is that it is based on self-reporting. One result of self-reporting is "job inflation", that is, people tend to classify themselves in higher status jobs than would an objective interviewer. For librarians, it is possible to reduce some of this effect by limiting consideration to librarians with four or five years of college, but this is still imprecise. Not all librarians have Master's degrees, but many people with Bachelor's and even Master's in other fields work as nonprofessionals in libraries.

Another data source is the Current Population Survey (CPS), conducted by the Bureau of the Census for the Bureau of Labor Statistics. It is an on-going monthly survey of a probability sample of households that represents approximately one individual in 1,500. It collects data on demographic and labor force characteristics of the U.S. population. The BLS uses it to estimate employment, unemployment, and labor force participation.

The CPS, like the Census, relies on individuals' identification of their job classification. It does make use of trained interviewers, which should reduce the job inflation to a certain extent. The data do, however, reflect a lower proportion of individuals with five or more years of college than identified in this study, and it thus appears that there is some inflation. In addition, because the sample is small and librarians such a small part of the total, the CPS figures for librarians suffer from a high sampling error. For example, the 1980 annual average CPS figure for librarians is 182,000 with a standard error of 15,000, giving a 95 percent

confidence interval of approximately 153,000 to 211,000 1/. The data on unemployed librarians are even less precise because the sample is so small.

The CPS was not designed to be a longitudinal survey, but the BLS has been experimenting with using it as one. The sample design is such that a household is in the sample for four months, out for eight, and back in for four, so it is possible to compare its responses from the first four months with those for the last four a year later. Not all households remain in the sample, due to refusals and to the fact that a household that changes its residence is lost. The BLS has been using these matched data to estimate labor force movement by occupation. The data are discussed under Replacement Demand (see Chapter 4, Section 4.2.4).

Another major BLS survey, the Occupational Employment Survey (OES), tries to get around the problems of self-reporting by interviewing employers instead of households. It therefore covers only employed individuals and the information collected is limited to the number of people employed in a given occupation and industry. Not all occupations are covered in all industries, however, and the survey is done on a three-year rotation, so that an industry is surveyed only once every three years. The BLS is switching from the CPS to the OES as the basis for its industry-occupation matrix, which is an important component of its long term projections. The BLS's 1980 OES-based estimate of the number of jobs held yy librarians (not including school audiovisual specialists, who are counted separately) is 134,000 as opposed to the CPS's 182,000.

The BLS and Census surveys cover the entire population from which information on librarians can be extracted. Another source of data specific to libraries and librarians is the National Center for Education Statistics (NCES). NCES performs periodic surveys of libraries. Each survey is of a specific type of library, and collects information on the individuals employed and on the institution. The NCES surveys are the most comprehensive sources of information about the nation's libraries. However, not all types of libraries are surveyed; those that are, are surveyed at

1/ Personal communication, Phil Rones, BLS.

different times, and the data elements on the various surveys have not been strictly comparable across types of libraries and over time.

In addition to the current library labor force, data were needed for this study on library education programs. The new graduates represent potential additions to the library labor force. The number of new graduates is a major factor in determining the future supply and demand balance. Furthermore, changes in the composition of this group, such as their sex and race, will eventually translate into changes in the composition of the library labor force as a whole.

Another reason for collecting data on new graduates is that the economic status of new graduates is a much more sensitive indicator of supply and demand within the profession than that of the existing labor force. Freeman [63] lists several reasons for this. One is that all new graduates are active on the job market at about the same time, while few older workers are, making the position of new graduates more immediately sensitive to supply-demand imbalances. Another is that employers find it easier to alter new hiring patterns and starting salaries; for example, they are more likely to not hire or to hire at lower salaries than to lay people off or reduce their salaries. Finally, more information is available to both employers and individuals on the economic circumstances of new graduates, for example, on placement rates and starting salaries -- and they act accordingly. Information on the economic status of librarians who are not recent graduates is more difficult to come by and to interpret. This is true in all fields but especially so in librarianship, where there is some information on new graduates but less systematic data collection on salaries among the experienced workforce, and even less data on unemployment.

Professional library education programs are generally Master's level, although some Bachelor's and non-library degree programs exist. The non-library degree programs are generally within departments of education, and award a degree in education or no degree at all, but a teaching certificate or equivalent. The American Library Association (ALA) accredits Master's level programs, which are then qualified to be members of the

Association of American Library Schools (AALS) 2/. Some nonaccredited Master's programs are associate members of AALS. More data are available for accredited Master's programs than for nonaccredited Master's programs that are associate members of AALS. Prior to this study, very few data existed on other nonaccredited Master's programs, Bachelor's programs and library certificate programs.

AALS has begun an annual comprehensive survey of its members and associate members. The survey has been performed three times, with the results now in print [14-16]. The results cover faculty, students, curriculum, income and expenditures, and continuing professional education. The information on students covers enrollment; profiles on the students themselves, including demographic and educational background; placement; and finance, including scholarships and costs of attending school.

The American Library Association's Office for Library Personnel Resources also surveys library education programs [4-6]. It surveys a wider range of programs, including non-Master's programs, but does not make a concerted effort to identify all of them. Its response rate among organizations other than accredited MLS programs is about 30 percent, and it makes no effort to characterize nonrespondents. It collects data on the number, sex and race of graduates by type of program.

Another source of data on numbers of graduates is NCES' survey of Earned Degrees Conferred [253-255]. It counts graduates in library science at both Bachelor's and Master's levels, regardless of accreditation, but it misses those in certificate programs or those earning a degree in another field such as education.

For longitudinal information on new graduates, the best source is the survey of accredited MLS programs performed annuallly since 1950, first by Donald Strout, then Carlyle Frarey, and currently Carol Learmont [49-57, 87-95, 143-155]. The survey is notable for its consistency over time, and

2/ To become the Association for Library and Information Science Education (ALISE) in 1983.

is the only source of detailed information on the library labor market for so long a period of time 3/. It surveys accredited Master's programs only, but collects data on sex, placement by type of library, and salaries. The respondents are schools, not individuals, and so the proportion of graduates for which there are data varies, depending on the proportion of its students for which each school can report.

1.4 Previous Research

It is surprising that so little research has been done on librarian supply and demand, given the amount of discussion of the job market in the professional literature. However, several key studies have been performed on which this study was based. Some other studies of the library labor market that are not specifically supply and demand projections are also relevant to this project. A third area of research relevant to this project is that of supply and demand in other occupations, the methodology of which can be applied to the library profession.

Research into library human resources has been characterized by a growing methodological sophistication and scope. Demand studies began by trying to project demand using fairly straightforward methods, but later studies looked at factors that affected demand and developed some causal models. Very little research has been done on the supply of librarians, however.

In 1969, Bolino [24] performed a qualitative analysis of trends affecting library employment, and a cross-sectional analysis of the number of academic librarians employed as a function of the characteristics of colleges and universities and of their geographical locations. His study is significant for its attempt to find mathematical relations between numbers of librarians employed and other factors. Then, in a study similar to Bolino's, Baumol and Marcus [21] performed a cross-sectional analysis of

3/ Because this survey is published in Library Journal, and the authorship has changed over time, we are referring to it as the LJ survey.

United States Office of Education (USOE) statistics on colleges and universities, including an investigation into institutional characteristics as determinants of staff size. Unfortunately, as they acknowledge, the data available to them were seriously flawed. Another attempt to project the demand for a particular group of librarians was the U.S. Office of Education's projections for school librarians and school media specialists [320]. These projections were based on enrollment and on several different student-librarian ratios.

The current study is most closely related to one performed in 1975 by the Bureau of Labor Statisics (BLS) [Library Manpower: A Study of Demand and Supply (BLS Bulletin 1852; hereafter referred to as Bulletin 1852)]. The purpose of this study performed for NCES was to fill in gaps in data on the employment of librarians and to present a comprehensive view of library human resources through the mid-1980's. It projected requirements for professional librarians in public, school, academic, and special libraries, and for library attendants and assistants; it projected the supply of librarians; and it discussed numerous qualitative issues related to staffing patterns, job functions, education and training needs, human resources problems in the library field, and factors that affect library human resources requirements.

The information was derived from existing statistics from the BLS, the Bureau of the Census, and the National Center for Education Statistics (NCES); from a search of the relevant literature for quantitative discussions of library manpower; and from about 100 interviews of library employers. The demand projections were based on BLS projections of the economy as a whole. Replacement needs were estimated by applying standard working life tables to Census data on the sex and age of librarians currently employed. Supply projections were based on NCES projections of earned degrees and of the proportion of graduates entering the labor market.

It would seem appropriate at this time to assess the accuracy of the projections of Bulletin 1852. To do this, rates of growth are compared. Bulletin 1852's basic projection was for a 23 percent increase

in the number of librarians employed between 1970 and 1980. The BLS' own current estimate is that the actual increase was 23 percent. (The Current Population Survey shows a greater increase of 50 percent.) Bulletin 1852 also expected that 103,000 Bachelor's and Master's degrees in library science would be awarded between 1970/71 and 1979/80; NCES' Survey of Earned Degrees Conferred, which is the basis for the BLS' projections, shows the figure to be around 82,000. At the time that Bulletin 1852 was written, no one foresaw the decline in library science degrees that began in 1975 and is continuing.

Another significant study was Cooper's of the demand for librarians in California [37]. Cooper's objectives were to project the demand for librarians in California and to develop a method of predicting demand for librarians which could be applied to other geographical areas. He did not directly project supply, although he did examine the available data on California's many library schools.

Cooper identified variables external to libraries that explained changes in the levels of employment of librarians in each of three major settings; public, school, and college and university libraries. His was a causal model; that is, he tried to identify demand variables that explained employment of librarians as a function of the need for them. The variables that he tested included per capita income, school enrollments, expenditures on local government and schools, and the like. After identifying likely variables, he tested their relationship to the employment of librarians and developed regression equations for each type of library. He then chose projected values of the independent variables, as developed by such agencies as the California Department of Finance and the statewide college and university administrative offices, and used his model to predict employment levels in 1985.

A 1977 report by the Library Association of Great Britain [94] projected supply and demand for librarians in that country. The authors reviewed a number of factors which have and will influence demand for librarians. These include government public expenditure plans; the growth

or reduction in the number of institutions, for example through amalgamation; the development of automated systems; the use of clerical staff for non-professional duties which are currently performed by professional staff; population changes, particularly changes in the proportion of the population which is receiving education; the tendency to fill full-time posts on a part-time basis; increased development of school libraries/ resource centers; changes in the demand for library or information services; changes in the level of industrial research and development; and the evolution of new forms of service. With this comprehensive list of factors in mind the report goes on to develop a rather simple model for estimation of demand. That model says that the demand at any time is the difference between the total number of established posts and the posts frozen or held vacant.

A recent study that included librarians within the context of the larger information economy is the Occupational Survey of Information Professionals (hereafter referred to as OSIP) performed by the University of Pittsburgh and King Research [40]. OSIP did not develop projections, but it is relevant to this study because it tried to estimate the total current employment of information professionals, including librarians. It developed a taxonomy of the scientific and technical information field in terms of the functions performed, and surveyed employers to derive estimates of the total personnel involved in addressing these functions in four major employment sectors: federal agencies, state and local government, colleges and universities, and private industries. Employers were asked for numbers of professional employees performing information functions in any of 23 subunits, one of which was libraries. They were also asked to list job titles for these individuals.

The Occupational Survey of Information Professionals found 1,641,000 information professionals in the United States. Librarians appear in OSIP primarily as professionals whose job titles can be grouped together under the library workfield and/or who are working in library subunits. OSIP found that 159,800 information professionals can be classified in the library workfield based on their job titles. Of these, 24,900 also work in a library subunit. About 48,000 individuals are in the

library workfield but not in a library subunit, and can be considered non-library information professionals.

A number of studies have been performed on specific groups of librarians, including a recent survey of a sample of members of the American Library Association (ALA) undertaken by Estabrook and Heim [45]. This collected current and some retrospective data on race, sex, age, employment status, positions held, type of library, professional involvement, and salary. While results cannot be extrapolated to the whole library work force, the data give a good indication of the demographics of a large subgroup. Other studies have also been done on various association members, including ALA, the Special Libraries Association, and the Medical Library Association.

1.5 Methodology

Projecting the supply and demand for librarians required that a model of the library labor market be developed, including the sources of supply and demand for librarians, and that the interactions among the various components be described. Figure 1 presents the components of this model. The current values of the various parameters of the model were then identified, using existing data or data collected specifically for this project. Finally, the values of these various parameters were estimated and used in the model to project the future conditions of the library labor market.

Projections were developed using a variety of methods. There are three general kinds of projection techniques: qualitative, time series, and causal. The choice of the most appropriate method for projecting a given parameter depends on the amount and quality of the historical data available, the time period to be projected, the precision needed, and any expectations about how future trends will be related to past facts. Each of the three kinds of projection methods was used at various points in this study's analyses.

Qualitative techniques are used when data are scarce, or when there is reason to believe that future trends will differ from past. Essentially, these methods consist of various ways of bringing together in a systematic way expert opinion on future events, combining the best judgements of knowledgeable people. The quality of the projections developed depends entirely on the ability of these experts to foresee future developments. They are only of use when other methods fail.

Time series analysis uses past data to identify trends, which are then extrapolated into the future, on the assumption that past trends will continue. This is more likely to be true over the short term than the long. Time series methods cannot predict turning points or changes in trends, which are by definition discontinuous with past experience. This method can be useful, however, when it is believed that future performance will be consistent with past experience.

A more sophisticated way of relating past and future performance is to use causal models. Causal models relate the past performance of the values to be projected to other factors, then project future performance as a function of expectations about these independent variables. Causal human resources models relate past supply and demand to other social and economic factors, then use projections of these exogenous variables to determine future supply and demand. Causal models are the most powerful and the most complex. They also require the most data, since they need historical data on both dependent and independent variables, and then need projections of the independent variables on which to base the projections of the dependent variables. Causal methods are better than the others at anticipating changes in trends, when such changes are a function of other, predictable changes in the larger system.

Causal methods of human resources projection are particularly useful in a changing market, which appears to be the case in librarianship. Cooper [37] modelled demand in the California library labor market by dividing it into sectors by type of library and testing the historical relationships between employment in each sector and other social and economic factors. In California, for example, he found employment in

school libraries to be a function of enrollment; in public libraries, of population; and in the University of California system, of enrollment and faculty size. For each of these independent variables, he then used projections developed by state agencies to generate projections of the demand for librarians.

In this project, a model of the library labor market which identified sources of supply and demand was developed and then the values of each of these components were projected. Different projection methods were used for the different components, depending on the data available, assumptions about the relationship of one component to other social and economic variables, and the sensitivity of the projections to changes in components.

1.6 Data Requirements

To model the library labor market and project supply and demand, data were needed on the current library labor market and on library education programs. The data needed were of three kinds:

1. Baseline data on the present library labor market; for example, the size of the current librarian labor force.

2. Historical data, to establish trends; for example the size of the librarian labor force at various points in time, from which to derive rates and directions of change and historical relationships.

3. Data on factors believed to influence the values of various parameters of the library labor market model for use in the causal models:

    a. Historical data, to establish past relationships;

    b. Current values;

    c. Projections, that is, expectations about future values on which to base projections of the library labor market.

The study relied as much as possible on data already available from other sources including previous NCES surveys, professional associations such as the American Association of Library Schools, and other research.

Some of the information required was not available uniformly across types of libraries and for all professional library education programs, so primary data collection was undertaken as part of this study. This was done by means of two surveys as part of this project: one of professional library education programs, hereafter called the Library School Survey; and an Employer Survey of public, school, academic, and special libraries.

The sections of this report that follow discuss the results of these two surveys in detail and present a projection of librarian supply and demand. Chapter 2 treats the current library labor market and includes pertinent data from other sources as well as the new survey results. The next chapter covers the demand for librarians, i.e., projections of future librarian employment in the different types of libraries. Supply is addressed in Chapter 4, which investigates library program graduates and other sources of entrants into professional library positions. The final chapter interprets both the current data and the projections in order to summarize the outlook for the library labor market and discusses these interpretations in light of their implications for the profession as a whole.

CHAPTER 2

THE LIBRARY LABOR MARKET

by
Nancy K. Roderer

2.1 Past Trends

Little information is available on the market for librarians generally. However, since 1950 Library Journal has published an annual survey of library placement [49-57, 87-93, 143-155]. This survey, which has become more comprehensive over the years, is a valuable source of information about the market for beginning librarians over time. This information plus that available from various other sources enables us to reconstruct the market for librarians since the early 1950's.

The market for new graduates is a good proxy for the more general library labor market. In any occupation, the market for new entrants is generally more responsive than that for experienced workers. Libraries are unlikely to lay off employees or cut their salaries, but they can and do reduce their hiring and not increase starting salaries over time. Furthermore, when jobs are scarce, employed experienced workers are more likely to simply hang onto the jobs they have. Although they may be underemployed or in less-than-ideal jobs, they are not unemployed. Most new graduates have no choice but to job hunt, however poor the market may be at that particular time. Conditions in the market for new library school graduates can therefore be expected to accurately reflect the state of the market for librarians generally.

The LJ survey data are somewhat biased in covering accredited MLS programs only. If employers prefer graduates of accredited MLS programs to those of nonaccredited programs or those with less than a Master's degree,

the market for these other groups will be more volatile. When employers can pick and choose, the other groups may experience higher unemployment, whereas when graduates are in short supply employers may have to hire whomever is available.

The data available indicate that until the 1970's the U.S. did not have enough librarians to fill the jobs available, but since then there has been an excess of librarians. All through the 1950's and 1960's, the library literature bemoaned the shortage of librarians — which the annual LJ survey attributed at least in part to relatively low salaries. It appears that the only MLS graduates who didn't go to work in libraries immediately upon graduation were those who didn't choose to. Jobs were not scarce; people to fill them were.

In the mid-1960's several indicators of change appeared. In 1965, the proportion of library school graduates placed in library positions began to decline (Table 1). Around 1967 librarian starting salaries began to decline relative to others' (Table 2), although librarian starting salaries were still higher than average salaries for all women and for professional women, suggesting that a woman entering a profession could do better in librarianship than in most others 1/.

In 1969, for the first time the LJ survey noted that new graduates were having trouble finding jobs. The country was in a recession that year, but the tight market for librarians continued past the recession's end. In 1970, the rapid growth in the number of MLS degrees awarded started to slow. Degrees awarded by accredited MLS programs had increased by 200 percent between 1960 and 1970; although the number of degrees awarded by accredited programs did not begin to decline until 1976, in 1970 the growth rate slowed. (Total Master's degrees in librarianship, from accredited and nonaccredited programs, began to decline a little earlier, in 1975 — Table 3.)

1/ The table data cannot be strictly compared. Since starting salaries are generally lower than overall salaries, however, the conclusion reached appears valid.

TABLE 1--Placement Rates of Graduates of Accredited MLS Programs in the United States: 1964-1981

Year	Percent Graduates Placement Not Known	Percent of Those Whose Placement is Known		Percent Graduates Known to Be in Library Positions
		In Library Positions	Not In Library Positions	
1964	16.4	94.3	5.7	78.9
1965	12.4	93.6	6.4	82.0
1966	15.0	93.9	6.1	79.7
1967	15.6	93.5	6.5	78.9
1968	22.0	92.9	7.0	76.2
1969	26.0	92.9	7.0	68.7
1970	26.0	91.3	8.7	67.6
1971	29.3	86.9	13.6	61.4
1972	30.7	87.6	12.4	60.7
1973	28.8	84.3	15.7	60.0
1974	33.7	85.8	11.8	60.3
1975	30.6	82.1	17.8	63.3
1976	26.5	75.9	24.0	55.8
1977	21.5	77.0	22.9	60.5
1978	23.9	81.1	18.9	61.6
1979	22.1	83.3	16.7	64.9
1980	19.2	80.8	19.1	65.3
1981	24.7	82.6	17.3	62.1

NOTE:
Data for responding accredited U.S. schools only.

SOURCES:
[49-57, 87-93, 143-155].

TABLE 2--Mean Starting Salaries for Librarians and Median Salaries for Professional Workers and All Workers: 1955-1981

Year	Librarians' Average Starting Salaries 1/2/	Median Salaries 3/ Professional Workers Male	Professional Workers Female	All Workers Male	All Workers Female
1955	$ 3,900	$ 5,382	$ 3,500	$ 4,252	$ 2,719
1956	4,190	5,847	3,650	4,466	2,827
1957	4,450	5,990	3,810	4,713	3,008
1958	4,683	6,513	4,146	4,927	3,102
1959	4,862	6,835	4,385	5,209	3,193
1960	5,083	6,848	4,384	5,417	3,293
1961	5,360	7,339	4,961	5,644	3,351
1962	5,661	7,357	4,863	5,794	3,446
1963	5,939	6,613	4,998	5,978	3,561
1964	6,176	8,004	5,150	6,195	3,690
1965	6,467	8,233	5,574	6,375	3,823
1966	6,925	8,945	5,826	6,848	3,973
1967	7,323	9,523	6,307	7,298	4,273
1968	7,714	10,151	6,691	--	--
1969	8,292	11,266	7,309	8,494	5,041
1970	8,734	11,806	8,878	9,015	5,385
1971	9,013	12,164	8,346	9,450	5,658
1972	9,312	13,029	8,796	10,258	5,993
1973	9,510	13,945	9,095	11,186	6,421
1974	10,062	14,453	9,587	11,874	6,897
1975	10,505	15,555	10,627	12,791	7,569
1976	11,012	16,401	11,081	13,533	8,171
1977	11,130	17,520	12,009	14,698	8,687
1978	12,382	18,998	12,547	15,779	9,443
1979	13,093	20,705	13,659	17,141	10,260
1980	14,170	--	--	--	--
1981	15,597	--	--	--	--

-- Data not available.

1/ Recalculated from Library Journal data. Library Journal survey salary average for 1955-79 is the average of the schools' averages; recalculated to weight each school by number of graduates placed.

NOTE:

Data are not strictly comparable. First column gives average, starting salaries while remaining columns give median salaries of all workers in a group, both starting and already employed. Column 1 includes both male and female starting librarians.

SOURCES:

2/ [49-57, 87-93, 143-155].

3/ [160-185].

TABLE 3--Master's Degrees Awarded in the U.S., by Field: 1950-1978

Year 1/	Total Master's Degrees	Social Science Master's	Library Science Master's
1950 2/	58,219	--	--
1951 2/	65,132	--	--
1952 2/	63,587	--	--
1953 2/	61,023	--	--
1954 2/	56,823	--	--
1955 2/	58,204	--	--
1956 2/	59,294	--	--
1957 2/	61,955	--	--
1958 2/	65,614	--	--
1959 2/	69,584	--	--
1960 3/	77,692	--	--
1961 3/	81,690	11,758	1,931
1962 3/	88,414	13,023	2,140
1963 3/	95,470	14,725	2,363
1964 3/	105,551	16,546	2,717
1965 3/	117,152	18,696	3,211
1966 3/	140,548	22,541	3,916
1967 3/	157,707	25,919	4,489
1968 3/	176,749	28,598	5,165
1969 4/	193,756	32,169	5,932
1970 4/	208,291	33,878	6,511
1971 4/	230,509	37,200	7,001
1972 4/	251,633	40,454	7,383
1973 4/	263,371	42,585	7,696
1974 4/	277,033	45,591	8,134
1975 4/	292,450	48,514	8,091
1976 4/	311,771	49,773	8,037
1977 4/	317,164	51,774	7,572
1978 4/	311,620	50,586	6,914

— Data not available.
1/ Years are academic years. 1950 is academic year 1949/50, and so forth.

SOURCES:
2/ [319].
3/ [277].
4/ [280].

Also around 1970, the Current Population Survey unemployment rate for librarians started rising (Table 4). The CPS data are unreliable for so small an occupation. Furthermore, the CPS definition of unemployment eliminates people trained as librarians working at something else because they cannot find a library job, and new graduates who have not yet held a professional position. The CPS also relies on self-reporting, which introduces another source of error. However, the trends in the CPS unemployment rates are probably fairly accurate, and they rose between 1970 and 1976.

In the early 1970's librarians' starting salaries continued to decline relative to others; in 1975 they fell below the average for professional women (see Table 2). Also in 1975, the number of graduates of accredited library programs finally began to decline (Table 5), although the number of Master's degrees in all fields continued to increase until 1977. From a peak of over 6,000 degrees in 1974, the number of MLS degrees awarded by accredited programs dropped precipitously to 4,670 in 1980; the drop was sharpest between 1975 and 1978.

In 1976, the CPS unemployment rate for librarians peaked, and the library placement rate for new graduates bottomed out. The market appears to have reached its nadir. The LJ survey added categories for underemployed graduates in temporary and non-professional positions in libraries, a sign that underemployment was perceived as significant. Placement of new graduates in libraries and the CPS unemployment rate both began to improve in 1977.

2.2 The Current Market

Considerably more comprehensive data are available on the current library labor market, based on the results of two surveys conducted as a part of the Library Human Resources project reported on in this publication. Surveys were conducted of libraries of all types, including public, academic, school, and special, and of library school programs leading to Master's and Bachelor's degrees in Library Science and to qualification for certification as school librarians. The detailed methodology followed in

TABLE 4--Unemployment Rates for Librarians and Selected Other Workers: 1963-1980

Year	Librarians 1/	Teachers Except College and University 1/	Professional and Technical Workers	All Civilian Workers
1963	1.9	1.2	1.8 2/	5.7 2/
1964	1.8	1.5	1.7 2/	5.2 2/
1965	1.6	1.3	1.5 2/	4.5 2/
1966	0.8	1.4	1.3 2/	3.8 2/
1967	1.5	1.3	1.3 2/	3.8 2/
1968	1.3	0.9	1.2 2/	3.6 2/
1969	1.9	1.2	1.3 2/	3.5 2/
1970	1.3	1.2	2.0 2/	4.9 2/
1971	1.9	1.8	2.9 2/	5.9 2/
1972	3.2	1.9	2.4 2/	5.6 2/
1973	3.1	2.0	2.2 2/	4.9 2/
1974	3.3	2.0	2.3 2/	5.6 2/
1975	2.7	2.5	3.2 2/	8.5 2/
1976	3.7	2.8	3.2 2/	7.7 2/
1977	2.4	3.1	3.0 2/	7.0 2/
1978	1.7	2.6	2.6 2/	6.0 2/
1979	2.7	2.7	2.4 2/	5.8 2/
1980	1.5	2.6	2.5 3/	7.1 3/

SOURCES:
1/ Unpublished U.S. Bureau of Labor Statistics data derived from the Current Population Survey.
2/ [231].
3/ [230].

TABLE 5--Degrees Awarded by Accredited MLS Programs, by Sex: 1955-1980

Year	Accredited MLS's		
	Male	Female	Total
1955 1/	--	--	1,351
1956 1/	--	--	1,264
1957 1/	--	--	1,399
1958 1/	--	--	1,263
1959 1/	--	--	1,544
1960 1/	--	--	1,710
1961 1/	--	--	1,715
1962 1/	--	--	1,925
1963 1/	--	--	2,188
1964 1/	--	--	2,568
1965 1/	--	--	2,891
1966 1/	--	--	3,338
1967 1/	--	--	3,746
1968 1/	--	--	4,355
1969 1/	--	--	4,513
1970 1/	--	--	5,150
1971 1/	--	--	5,451
1972 1/	--	--	5,794
1973 1/	--	--	6,059
1974 2/	1,376	4,947	6,323
1975 2/	1,390	4,929	6,319
1976 2/	1,350	4,695	6,045
1977 3/	1,094	4,404	5,498
1978 3/	975	3,749	4,724
1979 4/	975	3,829	4,804
1980 5/	912	3,758	4,670
1981 6/	922	2,787	3,795

— Data not available.

NOTE:
Data are for calendar years from 1955 to 1973 and academic years from 1974 to 1981.

SOURCES:
1/ [49-57, 87-93, 143-155].
2/ [4].
3/ [5].
4/ [14].
5/ [15].
6/ [16].

conducting these surveys is described in Appendix A; the results, which are discussed in this section, served as one of the bases for projecting future supply and demand.

Results of the Employer Survey reflect the current status of libraries as employers of librarians; other professionals; and technical, clerical, and other support staff. The types of libraries covered are public; academic; school, including both public and private school libraries; and special, including Federal libraries, libraries serving State governments, independent research libraries, State library agencies, and other special libraries serving predominantly the business sector. For each of the categories of personnel employed by these libraries, both the total number of employees and the total number of full-time equivalent (FTE) positions were identified. To determine the academic background of employed librarians, the survey obtained data on their educational status. Also looked at and reported here are data on the movement of librarians from educational programs to jobs, among various jobs, and otherwise in and out of the labor force. These data, obtained by looking at the previous status of librarians hired by libraries in 1982 and the subsequent status of librarians leaving libraries in 1982, provide detailed information on the labor force movement of professional librarians for the first time.

The current employment situation defines the current demand for librarians (at least by libraries) and the bulk of the current supply. A major addition to supply consists of library school graduates, investigated via the Library School Survey. This survey covered both ALA-accredited programs leading to the MLS 2/ and also nonaccredited MLS programs, BLS programs, and programs leading to eligibility for school library certification but not to a library degree per se. The data, then,

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2/ Used generically in this study to represent Master's degrees in library science including Master of Library Science (M.L.S.), Master of Arts (M.A.), Master of Arts in Librarianship (M.A.L.), Master of Arts in Library and Information Science (M.A.L.I.S.), Master of Arts in Library Science (M.A.L.S.), Master of Law Librarianship (M.L.L.), Master of Library Studies (M.L.S.), Master of Science (M.S.), Master of Science in Librarianship (M.S.L.), Master of Science in Library Media (M.S.L.M.), Master of Science in Library Science (M.S.L.S.), and Master of Science in Library Service (M.S.L.S.).

comprehensively cover the major educational programs preparing professional librarians. From both the Employer Survey and the Library School Survey, the relationships among the various degrees and positions in different types of libraries become evident. Also covered in the Library School Survey and contributing to an understanding of the current supply of library school graduates are data on placements, again covering graduates of each type of library education program.

In both the surveys conducted, most data items were obtained over a five year period, generally 1978 through 1982. These data give a clear indication of recent trends and, when combined with earlier trend data, bring the picture of library supply and demand up to date. In cases where data were previously not available, the survey results provide for the first time some basis for projecting future trends in these areas.

2.2.1 Librarian Demand: The Employment of Librarians by Libraries

In considering the current employment patterns of librarians, one looks firsts at the institutions in which they are employed. For librarians employed by libraries, there are four major categories of employers -- the public library, the college or university (academic) library, the school library, and the special library. Current estimates of the number of each of these types of libraries, as estimated in the Employer Survey, are given in Table 6. In all, there are nearly 44,000 libraries 3/. Elementary and secondary school libraries make up well over half of the total, including both public school libraries (defined as a library or library system within a local education agency) and private school libraries (for the most part individual libraries). In the survey, nearly all local education agencies were identified as having at least one staffed library or media center. About 70 percent of private schools reported having a staffed school library or media center.

3/ Calculated not in terms of individual facilities, but in terms of distinct systems or centers for each library type within the Employer Survey.

TABLE 6--Number of U.S. Libraries by Type: 1982 1/

Library Type	Number	Percent of Total
Public	8,140	19
Academic	2,960	7
School	25,230	57
Public School Districts	11,670	
Private	13,560	
Special	7,350	17
Federal and State	1,710	
Other	5,640	
TOTAL	43,680	100

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 7--Librarian Positions in Full Time Equivalency by Type of Library: 1978-1982 1/

	Type of Library				
Year	Public	Academic	School	Special	Total Employment
1978	30,050	19,900	60,820	15,640	126,420
1979	29,890	20,360	62,750	17,040	130,040
1980	30,410	20,410	62,420	17,480	130,720
1981	30,720	20,410	61,210	17,660	130,000
1982 2/	31,100	21,220	65,200	18,600	136,120

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.
2/ 1978-1981 data were reported directly as totals by survey respondents while 1982 data were calculated as the sum of full time employees plus full time equivalency of part time employees plus unfilled positions.

The second largest category of libraries is public, making up nearly 20 percent of the total. The total count of special libraries is about 7,500 and there are about 3,000 academic libraries. These numbers, of course, do not reflect the tremendous variation in size that exists both within and among the various types of libraries.

The heart of the demand picture is the number of currently employed librarians. These data are shown for the years 1978 through 1982 in Table 7. The Employer Survey defined librarians by their job responsibilities rather than their educational qualifications, indicating that those to be considered as librarians were "library staff members doing work requiring professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect." Using this definition, about 136,000 librarian positions (expressed in full time equivalents), were identified as existing in 1982. This number is consistent with other estimates of total library employment as developed by the Bureau of Labor Statistics (134,000 in 1980) [233] and the Occupational Survey of Information Professionals (126,000 in libraries in 1980) [40]. It is, as expected, lower than the estimate of 182,000 for 1980 from the Current Population Survey; the CPS data are based on individual self-reporting and include respondents with less than a college education, who would generally not be considered professional by the definitions used in this study.

Looking at librarians' positions by type of library, it is seen that about half of the librarians work in school libraries, about one-quarter in public libraries, and about 15 percent each in academic and special libraries. Over the last five years, there have been very modest increases in the total number of employed librarians and in employment in each library type. The greatest increase has been in the number of special librarians — 19 percent over five years, equivalent to an average annual increase of about 4 percent. In public libraries the average annual increase has been less than 1 percent and in academic and school libraries the increases have averaged slightly over 1 percent.

Table 8 gives a breakdown of full time equivalent librarian employment by geographic region as well as library type. Total employment has

TABLE 8--Librarian Positions in Full Time Equivalency by Type of Library and Geographic Region: 1978-1982 1/

Region and Year 2/	Type of Library				Total Employment
	Public	Academic	School	Special	
North Atlantic					
1978	10,740	6,620	14,200	7,520	39,080
1979	10,180	6,830	15,040	8,530	40,580
1980	10,200	6,840	14,960	8,910	40,910
1981	10,090	6,910	14,240	8,810	40,050
1982	10,600	7,160	14,910	9,310	41,980
Great Lakes					
1978	8,300	4,740	18,570	3,520	35,140
1979	8,460	4,800	17,520	3,470	34,250
1980	8,580	4,760	17,010	3,260	34,370
1981	8,900	4,690	16,650	3,430	33,670
1982	9,170	4,740	17,810	3,620	35,340
Southeast					
1978	4,500	4,050	18,420	2,050	29,020
1979	4,700	4,130	18,850	2,180	29,860
1980	4,930	4,180	18,960	2,290	30,360
1981	4,940	4,200	18,900	2,380	30,420
1982	4,240	4,410	19,660	2,570	30,880
West and Southwest					
1978	6,520	4,480	10,310	2,550	23,860
1979	6,560	4,600	11,870	2,870	25,900
1980	6,710	4,630	12,000	3,030	26,370
1981	6,780	4,600	11,910	3,030	26,320
1982	7,070	4,910	13,240	3,100	28,320

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.
2/ North Atlantic region includes - CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI AND VT.
Great Lakes region includes - IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD and WI.
Southeast region includes - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA and WV.
West and Southwest region includes - AK, AZ, CA, CO, HI, ID, MT, NV, NM, OK, OR, TX, UT, WA and WY.

increased in each region, but only very slightly in the Great Lakes. Average annual increases for the North Atlantic and Southeast regions have been just under 2 percent, while the West and Southwest's employment of librarians grew at a rate equivalent to 4 percent per year. The latter includes substantial growth in the number of school librarians.

The Employer Survey also gathered data on other library employees, including other professionals and technical, clerical and other support staff. Estimates of employment for these two groups are given in Tables 9 and 10. Other professionals were defined as "persons who though not librarians are in library positions normally requiring at least a Bachelor's degree in some other field," for example, curators, archivists, computer specialists, and subject bibliographers. The total estimated number of other professionals in libraries in 1982 is 16,000, with about 39 percent of these individuals in special libraries, 20 percent in school libraries, 26 percent in public libraries and 15 percent in academic libraries. Increases in the number of other professionals have been somewhat greater than in the number of librarians, with the former increasing an average of about 5 percent per year and the latter 2 percent.

As shown in Table 10, there were an estimated 155,000 technical, clerical and other support staff positions in libraries in 1982. About 32 percent of these were in school libraries, 30 percent in public libraries, 24 percent in academic libraries, and 15 percent in special libraries. Rates of increase over the last five years were comparable overall to those for librarians and about the same for each type of library.

Table 11 gives the total library employment, including librarians, other professionals, and technical, clerical and support staff over the 1978 through 1982 period. In total, 38 percent of library positions are in school libraries, 27 percent in public libraries, 15 percent in special libraries, and 20 percent in academic libraries. As with the component employee categories, the most striking aspect of these data is the very slow increase over time.

TABLE 9--Other Professional Positions in Full Time Equivalency by Type of Library: 1978-1982 1/

Year	Type of Library				Total Employment
	Public	Academic	School	Special	
1978	3,990	2,170	2,670	4,770	13,600
1979	4,280	2,350	3,060	5,920	15,610
1980	4,320	2,400	3,240	5,950	15,910
1981	4,300	2,570	3,450	5,960	16,280
1982	4,290	2,500	3,190	6,280	16,260

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 10--Technical, Clerical and Other Support Staff Positions in Full Time Equivalency by Type of Library: 1978-1982 1/

Year	Type of Library				Total Employment
	Public	Academic	School	Special	
1978	43,770	33,440	45,680	19,860	142,750
1979	43,400	34,180	47,250	21,280	146,110
1980	44,230	34,410	47,640	21,280	147,560
1981	43,580	35,540	47,610	20,460	147,190
1982	46,760	36,570	49,360	22,530	155,220

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 11--Total Library Positions in Full Time Equivalency by Type of Library: 1978-1982 1/

Year	Type of Library				Total Employment
	Public	Academic	School	Special	
1978	77,810	55,510	109,180	40,270	282,770
1979	77,570	56,890	113,060	44,240	291,760
1980	78,960	57,220	113,300	44,710	294,190
1981	78,600	58,520	112,270	44,080	293,470
1982	82,150	60,290	117,750	47,410	307,600

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 12--Total U.S. Library Employment by Type of Library and Staff Category: January 1, 1982 1/

Employee Category	Library Type				Total
	Public	Academic	School	Special	
	Number/%	Number/%	Number/%	Number/%	Number/%
Librarian	31,100/38	21,220/35	65,220/55	18,600/37	136,120/44
Other Professional	4,290/5	2,500/4	3,190/3	6,280/17	16,260/5
Technical, Clerical and Other Support Staff	46,760/57	36,570/61	49,360/42	22,530/45	155,220/50
TOTAL 307,600/100	82,150/100		60,290/100	117,750/100	47,410/100

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

NOTE:
Numbers may not add due to rounding.

Data for each of the three employee categories in libraries were collected in terms of full time employees, part time employees, full time equivalency of part time employees, and unfilled positions. For librarians, about 11 percent of all librarians are part time and work, on the average, about 43 percent of full time. Thus the number of individual librarians employed is somewhat greater (about 7 percent) than the number of filled full time equivalent positions, a factor which must be taken into account in looking at relative supply and demand for librarians. About 5 percent of other professionals and about 32 percent of technical, clerical, and other support personnel are part time, so that the factor of part time personnel is more significant in the latter category.

Table 12 gives totals and the percentage breakdown of library employees by employee category. Overall, 44 percent of library positions are professional librarians, 5 percent are other professionals, and 50 percent are technical, clerical and other support staff. Not surprisingly, the proportion of other professionals is higher in special libraries, while the proportion of technical, clerical and other support staff is higher in public and academic libraries. These relationships were observed over the time span of 1978-1982 in the Employer Survey to test the hypothesis that libraries are converting professional positions to support positions, that is, that the proportion of support positions has increased while the proportion of library positions has decreased. The data showed no significant changes in the relevant proportions; if such a change took place it is statistically imperceptible.

A significant characteristic of the library labor market is the large number of libraries employing one or only a small number of librarians. This has implications for career patterns and ultimately for the kinds of people who enter librarianship. One indication of the size of libraries in terms of professional staff is the average number of librarians per library. As shown in Table 13, this ranges from 2.5 librarians in special libraries to 7.2 librarians in academic libraries with the overall average being about three librarians per library. These

TABLE 13—Average Staff Size by Type of Library: January 1, 1982 1/

Average Staff Size	Library Type				
	Public	Academic	School	Special	All
Librarians	3.8	7.2	2.6	2.5	3.1
Other Professional	.5	.8	.1	.9	.4
Technical, Clerical and Other Support Staff	5.8	12.4	2.0	3.1	3.5
TOTAL	10.1	20.4	4.7	6.5	7.0

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 14—Number of Employed Librarians by Sex and Type of Library: January 1, 1982 1/

Employed Librarians	Library Type				
	Public	Academic	School	Special	Total
Female	29,040	13,770	61,080	14,620	118,510
Male	4,160	7,410	6,060	3,730	21,360
Percent Female	87	65	91	80	85

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

averages, of course, include some very large libraries as well as a large number of small libraries. Overall, 99 percent of libraries employ fewer than 40 librarians.

Table 13 also gives the average employment of other professionals and of technical, clerical and other support staff by type of library. On the average, there are less than one other professional and about four support staff members per library.

Table 14 gives a breakdown of librarian employees by sex. These data are useful in looking at future library supply and demand because they allow us to consider differential labor force participation rates, death and retirement rates, and so on as established separately for males and females. The data are also interesting in and of themselves, since they provide up-to-date information for librarians in all types of libraries.

According to the Employer Survey data, 85 percent of all librarians in 1982 were female. The percentage by type of library varies from 65 percent for academic libraries to 91 percent for school libraries. This pattern is very much the same as that of 1970 as reported in the BLS study of library manpower [233]. In that study, it was reported that in 1970 about 60 percent of male librarians and 26 percent of female librarians were employed in academic or special libraries. The 1982 data, according to the Employer Survey, reflect corresponding percentages of 52 percent and 24 percent. There is some slight movement among males away from special library employment to school library employment, and among females from school library employment to academic and special library employment.

In the Employer Survey, the educational attainment of employed librarians was also determined. Librarianship is not a closed profession, that is, not all individuals with library degrees work as librarians and not all practicing librarians have library degrees. This means that employed librarians can, and to some degree do, come from a labor pool considerably larger than library degree recipients alone. In this study, data were obtained on the educational background of all employed

librarians. To obtain data on changes in employment patterns, for example, more emphasis on the MLS, it would be necessary to look at the educational background of new employees over a period of time. These data were not collected in the Employer Survey.

As shown in Table 15, about 80 percent of all employed librarians have either library degrees or certification. This proportion varies from 70 percent in public libraries to 95 percent in academic libraries. Library degrees or certification programs considered included the MLS (alone or in combination with another graduate degree), four- and five-year Bachelor's degrees, school library certification, and other library degrees (includes Ph.D., D.L.S., etc.). Data on school library certifications reflect only those employees wih school library certification who have not also earned a BLS or MLS. In these categories, 75 percent of employed librarians with some type of library degree or certification have MLS degrees, 13 percent have BLS degrees, 8 percent have school library certification, and 4 percent fall in the "other" category. Fourteen percent of library degree holders have both an MLS and another graduate degree; these are found primarily in academic and school libraries and, in academic libraries, make up about 30 percent of all librarians.

As would be expected, most employees with school library certification are found in school libraries. Presumably, a large proportion of the other MLS and BLS degree holders working in school libraries are also certified, so that the total number of employees with certification is about 55,000.

The proportion of library employees without a library degree or certification is 18 percent overall and ranges from 5 percent in academic libraries to 27 percent in public libraries. There are about 10,000 employed librarians without library degrees who have Bachelor's degrees in other fields and about 6,000 who have graduate degrees in other fields. An additional 9,000, mostly in public libraries, have various other degrees or no degree.

TABLE 15--Educational Status of Employed Librarians by Type of Library: January 1, 1982 1/

Library Degree or Certificate	Library Type				
	Public	Academic	School	Special	Total
MLS Only	18,520	12,550	22,240	10,770	64,080
MLS Plus Other Graduate Degree	1,130	6,160	5,830	2,300	15,420
MLS, Other Degree Status Unknown	1,120	290	3,370	340	5,120
4-year Bachelor's in Library Science (BLS)	780	250	10,660	380	12,070
5th Year Bachelor's in Library Science (BLS)	200	400	1,720	80	2,400
School Library Certificate	440	130	8,590	110	9,270
Other Library Degree or Certificate	1,010	350	2,890	240	4,490
SUBTOTAL	23,200	20,130	55,300	14,220	112,850
No Library Degree or Certificate					
Graduate Degree	330	540	3,780	1,180	5,830
Bachelor's Degree	2,670	390	4,830	1,920	9,810
Other	6,040	80	2,190	810	9,120
SUBTOTAL	9,040	1,010	10,800	3,910	24,760
Unknown	960	40	1,040	220	2,260
TOTAL	33,200	21,800	67,140	18,350	139,870
Percent with Library Degree or Certification	70	95	82	77	80
Percent without Library Degree or Certification	27	5	16	21	18
Percent Unknown	3	*	2	1	2

* Less than 1 percent.

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

Earlier estimates by the Bureau of Labor Statistics suggested that no more than 40-50 percent of all librarians employed in the U.S. had a Master's degree in librarianship. In 1982, according to the Employer Survey, 60 percent of librarians had MLS's. Even accounting for differences in methodology, there is a clear indication that the proportion of librarians with MLS's has increased.

Also obtained from libraries or librarians' employers was information on individuals hired by the libraries in 1981 and individuals leaving the libraries in 1981. These data give a good picture of the movement of librarians among different libraries and different library types and between libraries and other occupations. The data obtained are shown in Tables 16 and 17.

The estimated number of librarians hired by individual libraries in 1981 was 23,000, with an estimated 17,200 leaving the same libraries, for a net difference of 5,800. Of the total new hires, 34 percent came directly from library schools, 44 percent from other library employment and 22 percent from other sources. Of particular interest among the employees coming from other library jobs were about 1,400 library technical, clerical or other support staff members promoted by libraries to professional positions (6%). No doubt some of these were individuals with professional library training who were temporarily in nonprofessional positions. Others represent nonprofessionals without specified education promoted into professional positions. Less than a thousand new library employees came from information professional positions outside of libraries.

Among librarians leaving positions (Table 17), 37 percent went to other library positions, 15 percent to other types of employment, and 49 percent did not go on to another job. The last category includes 22 percent not employed and not seeking work, which would include both retirements and people leaving the labor force temporarily. Among the librarians leaving for other employment, about 1,500 went on to non-library information professions.

TABLE 16--Previous Status of Newly Hired Librarians in U.S. Libraries: 1981 1/

Previous Status	Number	Percent
MLS	3,740	16
4-year BLS	920	4
School Library Certificate	1,690	7
Other Academic Programs	1,570	7
SUBTOTAL ACADEMIC PROGRAMS	7,920	34
Public Library	1,530	7
Academic Library	1,620	7
School Library	3,780	16
Special Library	1,800	8
Library Technical, Clerical or Other Support Staff Employed by the Same Library and Promoted to Another Position	1,350	6
SUBTOTAL LIBRARY EMPLOYMENT	10,080	44
Non-Library Information Professional Position	940	4
Any Other Employment	2,130	9
Unemployed but Actively Seeking Work	1,690	8
Unknown or Other	250	1
SUBTOTAL OTHER	5,010	22
TOTAL	23,010	100

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 17—Subsequent Status of Librarians Leaving U.S. Libraries: 1981 1/

Subsequent Status	Number	Percent
Public Library	1,540	9
School Library	2,790	16
Academic Library	770	4
Special Library	1,220	7
SUBTOTAL LIBRARY EMPLOYMENT	6,320	37
Non-Library Information Professional Position	1,470	9
Any Other Employment	1,070	6
SUBTOTAL OTHER EMPLOYMENT	2,540	15
Returned to School	850	5
Unemployed, but Actively Seeking Work	1,140	7
Not Employed and not Seeking Work	3,850	22
Died	920	5
Unknown or Other	1,630	9
SUBTOTAL NOT EMPLOYED OR OTHER	8,390	49
TOTAL	17,250	100

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

In the movement of librarians to new positions, the number of transfers to the same type of library and the number to other types of libraries is noteworthy. These data are shown in Table 18. About 37 percent of those leaving libraries and 44 percent of new hires went on to or came from other library positions. Of these, about 5,500 or 73 percent, went to the same type of library and the remaining 27 percent to other types of libraries. School librarians are most likely to stay in the same type of library, although a small number do go on to each of the other library types.

Table 19 shows movement between library positions and non-library information professional positions. About 9 percent of those leaving libraries and 4 percent of new hires went on to and came from non-library information professional jobs respectively. This means a small net transfer to information professional positions from already employed librarians. In the section below, movement of new graduates of library education programs to information professional positions is covered.

2.2.2 Librarian Supply: Graduates of Library Education Programs

As indicated earlier, the current employment in libraries represents the demand for librarians and the bulk of the supply. The major source of additions to supply is library school graduates, described by the Library Schoool Survey. This survey was administered to all schools that could be identified which award Master's or Bachelor's degrees in Library Science or offer programs leading to school library certification without a MLS or BLS degree. In all, a total of 113 Master's programs, 52 Bachelor's programs, and 212 school library certificate programs were identified in 275 schools, with a number of schools offering more than one program.

The picture of library school programs which emerged from the survey is a clear one of declining applicants, admissions, and graduates across all types of programs over the years studied. Table 20 gives applicant and admission data by program and year from 1978 (the 1977/78 academic

TABLE 18—Number of Librarians Changing from Employment in One Library to Employment in Another, by Type of Library: 1981 1/

	New Employer				
Previous Library Employer	Public	Academic	School	Special	Total
Public	1,020	150	310	160	1,640
Academic	120	700	60	350	1,230
School	140	90	2,850	130	3,210
Special	140	120	300	930	1,490
TOTAL	1,420	1,060	3,520	1,570	7,570

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 19—Number of Librarians Moving Among Library and Non-Library Information Professional Positions: 1981 1/

Original Position	New Position	Number
Information Professional	Public Library	100
	Academic Library	140
	School Library	480
	Special Library	220
	All Library Types	940
Public Library	Information Professional	260
Academic Library		180
School Library		710
Special Library		320
All Library Types		1,470

NOTE: Net movement to information professional positions is 530.

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

year) through 1982. Over the five year period, admissions to Master's programs (both accredited and nonaccredited) declined 26 percent, or 5 percent per year on the average. Over the same period, admissions to Bachelor's programs declined 39 percent and admissions to school library certificate programs 21 percent. The Bachelor's degree admissions are both quite low (310 in 1981/82) and declining rapidly, reflecting a phasing out of this degree. The factors involved in the declines in admissions to Master's and school library certificate programs will be discussed in Chapter 4 of this report.

Table 20 also shows the proportion of applicants who are admitted to library schools or programs. This proportion is higher -- around 90 percent -- for nonaccredited MLS, BLS, school library certificate programs than for accredited Master's programs. For accredited Master's programs, there has been a slight increase in the proportion of applicants admitted over the last five years, from 74 percent in 1978 to 78 percent in 1982.

Data on admissions include students who do not attend a particular school to which they are admitted, do not attend library school at all, or do not complete the program. Table 21 gives the total number of library program completions, again by degree program and year. Of the nearly 7,000 people completing library programs in 1981, about 60 percent received Master's degrees from accredited programs, 24 percent school library certificates, 11 percent Master's degrees from nonaccredited programs, and 5 percent Bachelor's degrees. Rates of decline are similar to those for admissions -- 31 percent over five years for Master's degrees (accredited programs), 37 percent for Master's degrees (nonaccredited programs), 35 percent for Bachelor's degrees, and 35 percent for school library certificates. The average annual decrease for Master's degree completions is about 6 percent.

Table 22 gives a breakdown of program completions by geographic region. The decline over the 5 year period in total graduates was greater in the Great Lake and North Atlantic regions than in the Southeast and West

TABLE 20—Number of Applications and Admissions to U.S. Library Education Programs by Type of Program: 1978-1982 1/

Program and Year 2/	Applicants	Admissions	Percent of Applicants Admitted
Master's in Library Science (Accredited)			
1978	11,480	8,530	74
1979	10,720	8,160	76
1980	9,360	7,270	78
1981	8,600	6,660	77
1982	8,080	6,310	78
Master's in Library Science (Nonaccredited)			
1978	1,280	1,160	91
1979	1,180	1,120	95
1980	1,300	1,130	87
1981	1,010	960	95
1982	900	860	96
Bachelor's in Library Science			
1978	590	510	86
1979	470	420	89
1980	490	440	90
1981	470	410	88
1982	360	310	86
School Library Certifications			
1978	3,090	2,740	89
1979	3,060	2,710	88
1980	2,560	2,320	90
1981	2,370	2,030	85
1982	2,430	2,170	89
All Programs			
1978	16,440	12,940	79
1979	15,430	12,410	80
1980	13,710	11,160	81
1981	12,450	10,060	81
1982	11,770	9,650	82

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.
2/ Years are academic years. 1977 is academic year 1976/77, and so forth.

TABLE 21—Number of U.S. Library Education Program Completions by Type of Program: 1977-1981 1/

Program and Year 2/	Completions
Master's in Library Science (Accredited)	
1977	6,080
1978	5,500
1979	5,050
1980	4,510
1981	4,200
Master's in Library Science (Nonaccredited)	
1977	1,230
1978	1,180
1979	1,040
1980	780
1981	770
Bachelor's in Library Science	
1977	480
1978	420
1979	400
1980	370
1981	310
School Library Certifications	
1977	2,620
1978	2,380
1979	2,190
1980	1,980
1981	1,700
All Programs	
1977	10,410
1978	9,480
1979	8,690
1980	7,640
1981	6,980

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.
2/ Years are academic years. 1977 is academic year 1976-1977, and so forth.

TABLE 22--U.S. Library Education Program Completions by Region and Type of Program: 1977-1981 1/

Region and Year 2/	Number of Completions				
	Master's in Library Science (Accredited Programs)	Master's in Library Science (Nonaccredited Programs)	Bachelor's In Library Science	School Library Certificate	Total
North Atlantic					
1977	2,050	240	110	450	2,850
1978	2,020	190	110	400	2,720
1979	1,760	160	110	350	2,380
1980	1,620	150	80	320	2,170
1981	1,350	150	80	230	1,810
Great Lakes					
1977	1,920	330	130	850	3,230
1978	1,590	320	120	720	2,750
1979	1,450	300	100	630	2,480
1980	1,340	270	90	540	2,240
1981	1,250	240	70	420	1,980
Southeast					
1977	1,090	400	190	690	2,370
1978	910	430	150	650	2,140
1979	960	420	150	590	2,120
1980	770	310	150	600	1,830
1981	820	340	110	540	1,810
West and Southwest					
1977	1,020	260	50	630	1,960
1978	980	240	40	610	1,870
1979	880	150	40	620	1,690
1980	780	50	50	510	1,390
1981	780	40	50	510	1,380

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

2/ North Atlantic region includes - CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI AND VT.
Great Lakes region includes - IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD and WI.
Southeast region includes - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA and WV.
West and Southwest region includes - AK, AZ, CA, CO, HI, ID, MT, NV, NM, OK, OR, TX, UT, WA and WY.

and Southwest regions. The West and Southwest's slower decline in graduates, especially from school library certification programs, parallels the greater growth in employment in school libraries in that region.

The Library School Survey also investigated the number of programs in each year and the average number of graduates per program. Evidence was obtained both on programs initiated over the 1977-1981 period and on programs discontinued, but for the most part, the net number of programs remained about the same. With regard to program size, Bachelor's and school library certificate programs are, on the average, quite small with generally less than 10 graduates per year. The average number of graduates from a Master's program was about 45 in 1981, down from 68 in 1977. Declines in program size reflect the overall declines in total numbers of students.

Table 23 breaks down library program graduates by sex. Just over 80 percent of MLS graduates are female with a slightly higher percentage from nonaccredited than accredited programs. It has been shown earlier that about the same percentage of employed librarians with MLS degrees are female, suggesting little change in this proportion over the years. A somewhat higher percent of Bachelor's graduates and school library certificate program completions — about 95 percent for the former and 90 percent for the latter -- are female. Again, these results are similar to those for all employed librarians with those degrees.

The Library School Survey went into detail on placements of library school graduates. The categories used were similar to those used by Learmont's LJ survey, which covers accredited MLS programs, but data were obtained on graduates of all library programs. Results are summarized in Tables 24 through 26.

Table 24 shows the number and percent of graduates from each program type taking library and information professional positions, going to other employment, and not obtaining employment in some sense. "Not working" in this table includes full time students, those unemployed and seeking work

TABLE 23--U.S. Library Education Program Completions by Sex and Type of Program: 1977-1981 1/

Program and Year	Women	Men	Total	Percent Women
Master's in Library Science (Accredited and Nonaccredited)				
1977	5,910	1,400	7,310	81
1978	5,330	1,350	6,680	80
1979	4,920	1,170	6,090	81
1980	4,320	970	5,290	82
1981	4,080	890	4,970	82
Bachelor's in Library Science				
1977	455	24	479	95
1978	396	26	421	94
1979	378	24	402	94
1980	342	26	368	93
1981	290	17	307	94
School Library Certifications				
1977	2,370	250	2,620	91
1978	2,160	220	2,380	91
1979	1,970	230	2,190	90
1980	1,800	180	1,980	91
1981	1,560	140	1,700	92
All Programs				
1977	8,740	1,670	10,410	84
1978	7,890	1,600	9,480	83
1979	7,270	1,420	8,690	84
1980	6,460	1,180	7,640	85
1981	5,930	1,050	6,980	85

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.

TABLE 24--Employment Status of U.S. Library Education Program Completions by Type of Program: 1977-1981 1/

Program and Year	Employment Status: Library and Information Professional Positions Number/%	Other Employment Number/%	Not Working 2/ Number/%	Total Number/%
Master's In Library Science (Accredited and Nonaccredited)				
1977	6,213/86	314/4	729/10	7,256/100
1978	5,748/85	340/5	665/10	6,753/100
1979	5,334/87	308/5	511/8	6,163/100
1980	4,682/88	274/5	509/9	5,415/100
1981	4,268/85	231/4	500/9	4,999/100
Bachelor's in Library Science				
1977	392/82	34/7	51/11	477/100
1978	324/77	52/12	45/11	421/100
1979	335/83	27/7	40/10	402/100
1980	280/77	37/10	48/13	365/100
1981	213/69	35/11	59/19	307/100
School Library Certifications				
1977	2,036/90	167/7	71/3	2,274/100
1978	1,948/88	189/3	73/1	2,210/100
1979	1,741/87	175/9	94/1	2,011/100
1980	1,578/84	172/9	139/7	1,889/100
1981	1,328/82	154/10	134/8	1,616/100
All Programs				
1977	8,641/86	515/5	851/9	10,007/100
1978	8,020/85	581/6	783/8	9,384/100
1979	7,410/86	510/6	645/8	8,576/100
1980	6,540/85	483/6	696/9	7,669/100
1981	5,809/84	420/6	693/10	6,922/100

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.
2/ Not working includes full-time students, those unemployed and seeking work, and those unemployed and not seeking work.

and those unemployed and not seeking work. Over the five year period covered, 86 percent of MLS graduates obtained library and information professional positions, as did 78 percent of BLS graduates and 86 percent of school library certificate program completions. This proportion declined for BLS and school library certificate completions over the 1977-1981 period, but did not do so significantly for MLS graduates.

In Table 25, the graduates of library programs going to library or information professional positions are broken down by library type. Graduates of MLS programs go about equally to professional positions in public, academic, school and special libraries, with an additional 5 percent going to non-professional library positions and 5 percent to non-library information professional positions. The proportions going to different types of libraries have remained fairly constant over the 1977-1981 period. As expected, BLS graduates and school library certificate completions are most likely to go to school libraries with small percentages also going to other types of library and information professional positions.

According to the library schools surveyed, in 1981 about 3,900 MLS graduates, 170 BLS graduates, and 1,300 school library certificate completions went into professional library positions. From libraries' data on hiring of new graduates, an estimated 3,700 MLS graduates, 920 BLS graduates, and 1,700 school library certificate completions went to professional library positions. In addition, another 1,600 new graduates of other library programs were reported as hired. The discrepancies in data for BLS and school library certificate programs suggest that the Library School Survey may not have reached all such programs, or that library schools and employers used somewhat different definitions of library programs. Since most of the discrepancy is related to individuals going into school libraries, it appears likely that some employers counted students from media programs as coming from library programs.

Librarian unemployment can be defined in different ways depending on the perspective chosen. Earlier in this chapter, the BLS unemployment rates for librarians were given. These reflect the proportion of persons considering themselves to be librarians who were previously employed and

TABLE 25--Library and Information Placements of U.S. Library Program Completions by Type of Program: 1977-1981 1/

Program and Year	Professional Library Positions: Public Library Number	%	Academic Library Number	%	School Library Number	%	Special Library Number	%	Non-Professional Library Positions Number	%	Non-Library Information Professional Positions Number	%	Total
Master's in Library Science (accredited and nonaccredited)													
1977	1,481	24	1,364	22	1,662	27	1,093	18	330	5	283	5	6,213
1978	1,418	25	1,421	25	1,394	24	897	16	374	7	244	4	5,748
1979	1,238	23	1,301	24	1,353	25	911	17	335	6	206	4	5,334
1980	1,006	21	1,097	23	1,294	28	843	18	235	5	207	4	4,682
1981	905	21	983	23	1,148	27	835	20	196	5	201	5	4,268
Bachelor's in Library Science													
1977	52	13	17	4	242	62	63	16	18	5	0	--	392
1978	22	7	17	5	241	74	20	6	9	3	15	5	324
1979	37	11	12	4	200	60	40	12	9	3	37	11	335
1980	27	10	2	1	192	69	25	9	11	4	23	8	280
1981	8	4	2	1	133	62	21	10	27	13	22	10	213
School Library Certifications													
1977	66	3	49	2	1,634	80	166	8	41	2	80	4	2,036
1978	48	2	106	5	1,628	84	37	2	60	3	69	4	1,948
1979	28	1	38	2	1,507	77	30	2	51	3	88	5	1,741
1980	28	2	36	2	1,372	87	36	2	47	3	59	4	1,578
1981	10	1	21	2	1,188	89	34	3	28	2	47	4	1,328
All Programs													
1977	1,599	18	1,430	17	3,538	41	1,322	15	389	5	363	4	8,641
1978	1,488	19	1,544	19	3,263	41	954	12	443	5	328	4	8,020
1979	1,303	18	1,351	18	3,060	41	981	13	395	5	331	4	7,410
1980	1,061	16	1,135	17	2,858	44	904	14	293	4	289	4	6,540
1981	923	16	1,006	17	2,469	43	890	15	251	4	270	5	5,809

NOTE: Percentages calculated as proportion of those completions who obtained library or information professional positions.

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.

are currently seeking work. A parallel definition of unemployment among new librarians would be the proportion of those who sought work after graduation and did not find it. This is defined as the minimum unemployment rate for new graduates, which would be expected to be equal to or larger than the rate for all librarians. As indicated in Table 26, the minimum unemployment rate for library program graduates is about 4 percent, as compared with the Bureau of Labor Statistics' rate of about 2 percent for all librarians. (See Table 4)

In some sense, library school graduates that are underemployed as non-professionals in libraries or employed outside libraries may also be considered as unemployed, since at least some of them would presumably be employed as librarians given the opportunity. Considering these two groups as unemployed (as librarians) gives what can be considered an upper limit on new librarian unemployment. Over the 1977-1981 period, then, new librarian unemployment stayed generally in the range of 4 to 14 percent.

A key question in this study of librarian supply and demand is the future number of library program graduates. Chapter 4 projects these figures statistically, but the Library School Survey also asked for projections from the schools themselves. The library schools' projections are shown in Table 27. In contrast with the trends of the last five years (see Table 21), library schools projected overall increases in graduates through 1986, with five year growth rates of 11 percent for Master's degree graduates (accredited programs), 37 percent for Master's degree graduates (nonaccredited programs), 33 percent for Bachelor's degree graduates, and 24 for school library certification completions. The upswing was projected by the Library Schools to start generally in 1983. Since the Library School Survey was conducted in the summer of 1982, the library schools' projected growth in graduates may be due to known increases in applicants for the 1982/83 academic year. It also presumably reflects expectations about expanded programs preparing people for information professional as well as librarian positions.

TABLE 26—Labor Force Status of U.S. Library Education Program Completions Not Employed as Librarians: 1977-1981 1/

	Labor Force Status				
	Unemployed and Seeking Work	Employed as Library Non-Professional	Employed Outside Library	Total Seeking Employment	Librarian Unemployment Rate Range
All Library Program Graduates					
1977	445	389	515	9,601	5 - 14
1978	335	444	581	8,936	4 - 15
1979	223	395	510	8,154	3 - 14
1980	260	293	483	7,233	4 - 14
1981	249	251	420	6,428	4 - 14

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.

TABLE 27—Projections of U.S. Library Education Program Completions by Type of Program: 1982-1986

Program and Year 2/	Number of Completions
Master's in Library Science (Accredited)	
1982	4,190
1983	4,240
1984	4,390
1985	4,450
1986	4,630
Master's in Library Science (Nonaccredited)	
1982	730
1983	800
1984	850
1985	910
1986	1,000
Bachelor's in Library Science	
1982	270
1983	270
1984	330
1985	340
1986	360
School Library Certifications	
1982	1,620
1983	1,580
1984	1,840
1985	1,970
1986	2,020
All Programs	
1982	6,810
1983	6,890
1984	7,410
1985	7,670
1986	8,010

NOTE:
Completions as projected by the library schools.

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.

CHAPTER 3

PROJECTIONS OF DEMAND

by
Michael D. Cooper

This chapter discusses the methods used and the results obtained in projecting the demand for librarians to 1990. In projecting demand, separate models were developed for public, academic, school and special libraries. Also addressed is the potential demand for librarians as non-library information professionals.

The demand for librarians is taken as the total projected employment by libraries in a given year. The bulk of these positions will generally be filled by individuals remaining in the same position or moving from one library of a given type to another of the same type. Additional demand is of two types: the first due to increases in the number of positions and the second due to individuals leaving library employment. The number of positions gained (or lost) by increases (decreases) in the number of positions is called growth demand. The number of positions made available by individuals leaving library employment is called turnover or replacement demand, and includes positions made available by death or retirement, other labor force departures, and occupational transfers.

Table 28 gives the employment patterns in the various types of libraries over the period 1978 through 1982 with projections to 1990. Percentage increases for the periods 1978-1982, 1982-1986 and 1986-1990 are given for purposes of comparison. As shown, there were overall increases in staffing for all types of libraries in the 1978-1982 period, but very small increases. The total increase of 8 percent over the period is equivalent to only about 2 percent per year.

TABLE 28—Librarian Employment in the United States by Type of Library, with Projections: 1978-1990 1/

Year	Type of Library					
	Public	College and University	Public School	Non-Public School	Special	Total
1978	30,100	19,900	50,600	10,200	15,600	126,400
1979	29,900	20,400	51,100	10,700	17,100	130,000
1980	30,400	20,400	50,600	11,800	17,500	130,700
1981	30,700	20,400	49,200	12,000	17,700	130,000
1982	31,100	21,200	51,600	13,600	18,600	136,100
Projections						
1983	31,300	23,100	51,500	13,600	19,100	138,600
1984	31,100	22,700	51,200	13,600	19,600	138,200
1985	31,300	22,400	50,400	13,600	20,200	137,900
1986	31,800	22,100	48,500	13,600	20,700	136,700
1987	32,400	21,700	47,600	13,600	21,200	136,500
1988	33,000	21,200	47,400	13,600	22,800	137,000
1989	33,500	20,700	46,800	13,600	22,400	137,000
1990	33,700	20,500	46,800	13,600	22,900	137,500
Percentage Increases						
1978-1982	3	2	2	33	20	8
1982-1986	2	4	-6	--	12	*
1986-1990	6	-7	-4	—	11	1

* Less than 1 percent.

1/ From NCES/OLLT, Library Human Resources Employer Survey, 1982. Projections developed by King Research, Inc.

Projections for 1982-1986 suggest even smaller increases and, in the case of school librarians, a decrease in employment. Very modest increases are expected in public and special librarian positions. Overall, the net increase in employment is less than 1 percent, equivalent to .1 percent per year. For 1986-1990, positions are expected to decrease for school and academic libraries and to increase slightly for public and special libraries. The overall rate of change for 1986-1990 is an increase of 1 percent.

3.1 Public Library Employment

Most public libraries are operated by local governments and are subject to the same fiscal constraints as police departments, welfare agencies, and park and recreation departments. Data on total expenditures for state and local government and expenditures in selected categories, including libraries, are shown in Table 29. The average annual rate of growth of total expenditures for state and local governments from 1960 to 1979 was about 10 percent in current dollars. During the same period library expenditures increased at an annual rate of about 9 percent in current dollars. In the last five years, though, library expenditures have increased at only 7 percent per year in current dollars, which equates to 1 percent in constant dollars.

The major source of public library revenue is property tax. Between 1960 and 1980, property tax revenues increased at an average annual rate of about 7 percent in current dollars (Table 30) and 4 percent in constant dollars (data not shown). As a proportion of total revenue, property tax revenue has dropped from 42 percent in 1960 to 25 percent in 1980. Many other sources of revenue have been developed for local governments, including special assessment districts, and these serve to broaden the revenue base. Nevetheless, local government expenditures on libraries have increased less rapidly than other categories of government expenditures.

Overall employment at the local government level increased from 1960 to 1979 at an average annual rate of 4.3 percent (Table 31). The

TABLE 29—Selected Expenditures by U.S. State and Local Governments: 1960-1979 (Millions of Current Dollars)

Year	Total Expenditures	Expenditure Category				
		Education	Public Welfare	Police	Parks and Recreation	Libraries
1960 1/	60,999	18,719	4,404	1,857	770	278
1961 2/	67,023	20,574	4,720	2,017	857	368
1962 2/	70,547	22,216	5,084	2,130	886	340
1963 3/	74,698	23,729	5,420	2,231	902	375
1964 2/	80,579	26,286	5,766	2,366	1,022	401
1965 3/	86,554	28,563	6,315	2,549	1,104	444
1966 3/	94,906	33,287	6,757	2,776	1,187	486
1967 4/	105,978	37,919	8,218	3,049	1,291	518
1968 4/	116,234	41,158	9,857	3,410	1,412	573
1969 4/	131,600	47,238	13,110	3,901	1,645	634
1970 4/	148,052	52,718	14,679	4,494	1,888	700
1971 4/	170,766	59,413	18,226	5,228	2,109	761
1972 5/	188,825	64,886	21,070	5,976	2,323	814
1973 5/	205,336	69,714	23,582	6,710	2,561	877
1974 5/	226,032	75,833	23,085	7,289	2,951	968
1975 6/	269,215	87,858	28,155	8,526	3,462	1,119
1976 7/	304,229	97,216	32,604	9,531	3,864	1,249
1977 7/	322,780	102,805	35,941	10,380	3,871	1,259
1978 7/	346,786	110,758	39,140	11,306	5,270	1,362
1979 7/	381,867	119,448	41,898	12,207	5,896	1,505

NOTE:
Because of rounding, details may not add to totals.

SOURCES:
1/ [186], pp. 20-21.
2/ [187], pp. 20-21.
3/ [188], pp. 18-19.
4/ [189], pp. 18-19.
5/ [190], pp. 16-17.
6/ [191], pp. 16-17.
7/ [193], pp. 16.

TABLE 30—Revenues of U.S. Local Governments by Source: 1960-1980
(Millions of Current Dollars)

Year	Total Revenue	Source of Revenue			
		Total General Revenue 1/	Individual Income Taxes	Sales and Gross Receipts Taxes	Property Taxes
1960 2/	37,324	33,027	254	1,339	15,798
1961 2/	40,483	35,899	258	1,432	17,370
1962 2/	43,147	38,346	309	1,456	18,414
1963 2/	45,586	40,558	311	1,574	19,145
1964 2/	49,578	44,084	376	1,806	20,519
1965 2/	53,408	47,528	433	2,059	21,817
1966 2/	59,268	53,172	472	2,041	23,836
1967 2/	64,608	58,235	916	1,956	25,186
1968 2/	70,171	63,181	1,077	1,932	26,835
1969 2/	79,274	71,943	1,381	2,470	29,692
1970 2/	89,082	80,916	1,630	3,068	32,963
1971 2/	100,993	91,964	1,747	3,662	36,726
1972 2/	114,791	105,243	2,230	4,268	41,620
1973 2	129,119	118,392	2,406	4,924	43,970
1974 2/	143,132	131,434	2,413	5,542	46,404
1975 2/	159,726	146,307	2,635	6,468	50,040
1976 2/	178,338	162,931	3,127	7,156	54,884
1977 2/	196,458	179,045	3,754	8,278	60,267
1978 3/	214,518	194,783	4,071	9,326	64,058
1979 4/	234,630	211,986	4,309	10,579	62,453
1980 5/	258,298	232,453	4,990	12,072	65,607

1/ General revenue includes all revenue of government except utilities, liquor stores, and insurance-trust revenues.

SOURCES:
2/ [196], pp. 52-53.
3/ [192], pp. 17.
4/ [193], pp. 17.
5/ [194], pp. 17.

TABLE 31—FTE Employment in Federal, State and Local Goverments in the United States: 1960-1980

Year	FTE Employment (Thousands)		
	Federal Civilian	State	Local
1960	2,428	1,353	4,217
1961	2,413	1,435	4,210
1962	2,480	1,478	4,480
1963	2,524	1,558	4,724
1964	2,519	1,639	4,947
1965	2,510	1,751	5,186
1966	2,617	1,864	5,399
1967	2,883	1,946	5,509
1968	2,979	2,085	5,795
1969	3,002	2,179	5,981
1970	2,997	2,302	6,226
1971	2,899	2,384	6,422
1972	2,882	2,487	6,750
1973	2,822	2,547	7,031
1974	2,825	2,653	7,199
1975	2,877	2,744	7,354
1976	2,879	2,799	7,407
1977	2,855	2,903	7,688
1978	2,875	2,966	7,758
1979	2,897	3,072	7,871
1980	2,987 1/	—	—

— Indicates data are not available.

SOURCE:
1/ [213], p. 7-8.

employment trends in public libraries show the average annual increase from 1961 to 1979 in FTE local library employees was 3 percent; about half the size of the increase in local government employees (Table 32).1/

There is considerable variety in estimates of the number of professional librarians employed in public libraries (see Table 32). The most comprehensive and consistent estimates were made by the Bureau of Labor Statistics. Those show a 5 percent annual increase in employment from 1960 to 1978. The Library Human Resources Survey, conducted for this report, shows public librarian employment maintaining a relatively stable level of 30,000-31,000 full time equivalents during the period 1978-1982.

3.2 College and University Library Employment

The rapid growth in enrollment in two-year public colleges began to level off in 1975 and since then it has increased much less rapidly. Similarly, the 1970's saw a reduction in the growth rate of four-year public college and university enrollment. Throughout the 1960's and 1970's enrollment in private two and four-year colleges and universities remained relatively constant compared to their counterpart public institutions (Table 33).

The average annual rate of growth of instructional staff in all colleges and universities was about 5 percent during the period 1960-1980 (Table 34). However, since 1975 it has declined to 1 percent, indicating that the effect of declining birth rates and enrollments is beginning to be felt.

Expenditures of colleges and universities have increased from $44 million current dollars in 1969 to $54 million in 1978 (Table 35). This represents a 2 percent average annual decline in constant dollar terms. Fortunately, college and university library operating expenditures (Table

1/ Local library employees include all library workers: professional, paraprofessional, clerical, managerial, maintenance, etc.

Table 32—Number of Public Library Employees in the United States: 1960-1982

Year	Public Librarians 1/				Local Library Employees 2/	
	Digest Ed.Stat.3/	OE Stat. of PL's.	BLS Estimates	Survey Estimates	FTE	Total
1960	19,500 4/	10,748 12/	17,700 7/	—	—	—
1961	19,800 9/	—	18,300 8/	—	42,000 5/	54,798
1962	20,200 4/	12,355 10/	19,000 8/	—	44,000 5/	57,295
1963	20,400 9/	—	21,000 8/	—	46,000 5/	63,114
1964	20,800 4/	—	22,700 8/	—	49,200 5/	67,700
1965	21,200 9/	14,040 11/	24,000 8/	—	51,441 6/	71,549
1966	21,600 4/	—	24,700 8/	—	54,349 6/	74,487
1967	—	—	25,000 8/	—	51,508 6/	74,603
1968	—	8,498 15/	25,000 8/	—	53,711 6/	74,881
1969	—	—	25,700 8/	—	55,636 6/	77,473
1970	24,400 3/	—	26,300 8/	—	56,545 6/	79,218
1971	—	—	26,000 8/	—	57,139 6/	78,266
1972	—	—	27,000 8/	—	58,836 6/	81,120
1973	—	—	29,300 8/	—	62,486 6/	88,116
1974	—	36,135 13/	29,500 8/	—	64,179 6/	89,589
1975	—	—	30,000 8/	—	63,736 6/	89,639
1976	—	—	30,110 8/	—	63,985 6/	90,101
1977	—	—	31,000 8/	—	64,581 6/	92,566
1978	—	—	33,000 8/	30,100 14/	65,540 6/	91,477
1979	—	—	—	29,900 14/	65,305 6/	93,812
1980	—	—	—	30,400 14/	66,000 6/	96,561
1981	—	—	—	30,700 14/	—	—
1982	—	—	—	31,100 14/	—	—

— Indicates data are not available.

NOTE:

This table consolidates estimates of the number of librarians employed in the United States from various sources. Column 1 is from the Digest of Educational Statistics, column 2 is from the Office of Education Statistics of Public Libraries, column 3 is from estimates by the Bureau of Labor Statistics, column 4 is from the results of the Library Human Resources Survey and columns 5 and 6 are Census data on government employment.

TABLE 32—NOTES (continued)

1/ The definitions of professional librarian vary with the data sources and may not be comparable. For example, the Office of Education, defines professional positions as those requiring the occupant to perform work that requires education, training, and skill in the theoretical or scientific aspects of library work as distinct from its merely mechanical and clerical aspects. The definition used by the BLS Library Manpower study distinguishes professionals on the basis of duties performed, not on the basis of educational background. The Census data is self-enumerated, depending on the respondent's own definition of his position. The size of the communities surveyed differs between sources and may not be comparable. In general, statistics for FTE public librarians (Columns 1-4) represent libraries serving populations of at least 25,000 or 35,000.

2/ Local Library Employees refers to non-librarian and librarian staff.

3/ Estimates based on OE Statistics of Public Libraries (Column 2) with expansion for libraries serving less than 25,000 or 35,000.

SOURCES:

4/ [299], p. 118.
5/ [216]-[219].
6/ [199]-[214].
7/ [233], p. 2.
8/ Librarians tech memo for 1980-81 Occupational Outlook Handbook, by Lisa Dillich, April 15, 1979, also a memo from Lisa Dillich on October 16, 1979: Revision of 1978 Employment Estimate and 1990 Projection for Librarians.
9/ [297], p. 166.
10/ [323], p. 4. Includes only filled professional positions.
11/ [322], p. 3. Includes only filled professional positions.
12/ The sum of FTE filled professional positions as reported in: a) [325], p. 4; b) [326], p. 6; c) [324], p. 6.
13/ [290], pp. 1-3.
14/ NCES/OLLT Library Human Resources Employer Survey, 1982.
15/ [309], p. 8. Includes only employees holding 5th year librarianship degree.

Table 33 — Enrollment in U.S. Institutions of Higher Education: 1960-1979

Year	Institution Type			
	Public Institutions		Private Institutions	
	2-Year	4-Year	2-Year	4-Year
1960 1/	393,553	1,742,137	60,064	1,414,253
1961	456,381 2/	1,872,531 3/	61,544 2/	1,470,187
1962	519,257 2/	2,054,463 3/	70,272 2/	1,530,944
1963	551,308 2/	2,514,540 4/	73,481 2/	1,626,538
1964	620,859 2/	2,846,849 4	90,009 2/	1,722,303
1965	737,890 2/	3,231,706 4/	103,547 2/	1,847,721
1966	840,000 2/	3,508,917 3/	105,000 2/	1,935,955
1967	966,000 2/	3,850,028 3/	109,000 2/	1,986,720
1968	1,169,635 2/	4,261,017 4/	112,358 2/	1,962,081
1969	1,412,610 2/	4,484,258 4/	115,819 2/	1,991,973
1970	1,519,762 2/	4,908,372 4/	110,220 2/	2,042,533
1971 5/	2,366,612	4,488,073	124,808	2,045,538
1972 5/	2,553,533	4,569,342	117,401	2,057,511
1973 5/	2,804,594	4,673,813	123,223	2,092,667
1974 6/	3,298,871	4,750,724	129,771	2,142,173
1975 7/	3,850,990	5,045,024	150,973	2,243,725
1976 8/	3,765,907	4,946,727	150,706	2,258,086
1977 8/	3,912,968	4,994,623	166,016	2,341,413
1978 8/	3,882,823	4,960,378	182,009	2,366,740
1979 8/	4,069,462	5,026,942	180,565	2,430,157

SOURCES:

1/ [246], p. 73.
2/ [249], p. 98.
3/ Computed by subtracting the number of 2-year institutions as reported in column 1 from total number of institutions of higher education, as reported in [245], p. 74.
4/ Computed by subtracting the number of 2-year institutions from total number of institutions of higher education, as reported in [248], p. 88.
5/ [257], p. 6.
6/ [259], p. 2.
7/ [258], p. 2.
8/ [260], p. 2.

TABLE 34--Full and Part Time Instructional Staff in U.S. Colleges and Universities: 1960-1980

Year	Total Instructional Staff
1960	276,000 e
1961	292,000
1962	312,000 e
1963	331,000
1964	367,000 e
1965	412,000 e
1966	445,000
1967	484,000
1968	523,000
1969	546,000 e
1970	573,000
1971	590,000 e
1972	590,000
1973	634,000 e
1974	695,000 e
1975	781,000 e
1976	793,000
1977	812,000 e
1978	809,000 e
1979	822,000 e
1980	840,000 e

e Indicates data estimated by source.

SOURCE: [252], Table 98.

TABLE 35—Expenditures by U.S. Institutions of Higher Education: 1969-1978
(Millions of Current Dollars)

Year	All Institutions	Institution Type	
		Total Public	Total Nonpublic
1969	44.0	28.2	15.8
1970	46.3	29.7	16.6
1971	48.0	31.4	16.6
1972	49.7	32.6	17.1
1973	50.9	33.7	17.2
1974	51.0	34.2	16.8
1975	51.4	34.7	16.7
1976	52.8	36.0	16.8
1977	54.3	36.8	17.5
1978	54.2	36.5	17.5

SOURCE: [280], pp. 112-115.

36) have kept pace with inflation, increasing at 3 percent per year in constant dollars.

The number of college and university librarians increased from 9,700 in 1961 to 23,308 in 1977, an average annual rate of 7 percent. However, the Library Human Resources Survey results show the number increasing at only 2 percent from 1978-1982 (Table 37), a significant reduction in the growth rate.

3.3 School Library Employment

Public school enrollment reached a peak in 1971 and has been declining ever since. Although not as pronounced, the trend in non-public school enrollment is the same: it has been declining since 1966 but showed a slight upturn in 1976 (see Table 38). Other indicators show the same general pattern. The number of public elementary schools has declined from 91,853 in 1960 to 62,644 in 1977, while the number of public secondary schools has remained relatively constant (Table 39) and the number of teachers in public schools grew steadily until 1975 but then, in response to lagging enrollment, started to decline (Table 40). Public school expenditures, as shown in Table 41, showed a modest average annual constant dollar increase of 4 percent in the period from 1965 to 1977.

In summary, declining enrollments have already hit public elementary schools and no doubt will soon have an impact on public secondary schools. Further, the decline in number of teachers has already begun. Only constant dollar expenditures for schools are modestly increasing.

Throughout this period of decline in enrollment, the number of public school librarians has increased steadily by about 10 percent per year (1964-1976). Only during the period from 1978 to 1982 did their number level off at about 50,000 to 51,000 (see Table 42).

TABLE 36—College and University Library Expenditures: 1960-1979
(Thousands of Current Dollars)

Year	Library Expenditures
1960 1/	135,384
1961 2/	158,900
1962 3/	177,362
1963 2/	213,000
1964 4/	236,718
1965 5/	275,000
1966 1/	346,248
1967	---
1968 1/	493,266
1969 6/	584,847
1970 1/	652,596
1971 7/	737,533
1972 1/	764,481
1973 8/	840,727
1974 9/	938,622
1975 10/	1,001,868
1976 11/	1,223,723
1977 12/	1,250,314
1978 13/	1,348,748
1979 14/	1,426,614

— Indicates data are not available.

SOURCES:

1/ [250], p. 135.
2/ [303], p. 5.
3/ [247], p. 114.
4/ [248], p. 130.
5/ [7], p. 6-9.
6/ [305], p. 62.
7/ [306], p. 44.
8/ [265], pp. 12-15.
9/ [266], pp. 8-11.
10/ [249], pp. 141.
11/ [267], pp. 4-7.
12/ [268], pp. 4-7.
13/ [269], pp. 12.
14/ [270], pp. 12-15.

TABLE 37—Number of FTE Employees in U.S. College and University Libraries: 1961-1981

Year	Total Professionals	Total Non-Professionals 1/
1961 2/	9,700	9,800
1962 3/	10,328	10,772
1963 2/	11,200	12,100
1964 4/	11,862	13,298
1965 5/	12,500	14,500
1966 5/	13,000 6/	16,000 6/
1967 7/	18,285	23,435
1968 8/	19,451	24,054
1969 9/	20,149	25,001
1970	--	--
1971 10/	21,349	26,862
1972	--	--
1973 11/	23,513	30,919
1974	--	--
1975 12/	23,530	33,306
1976 12/	23,104	33,748
1977 13/	23,308	33,779
1978 14/	19,900	33,400
1979 14/	20,400	34,200
1980 14/	20,400	34,400
1981 14/	20,400	35,500
1982 14/	21,200	35,400

-- Indicates data are not available.

SOURCES:

1/ Includes student assistants and maintenance staff.
2/ [303], p. 5.
3/ [321], p. 11.
4/ [303], p. 18.
5/ [7], p. 6-9.
6/ Estimated in [7].
7/ [274], p. 5-7.
8/ [304], pp. 65.
9/ [305], pp. 17.
10/ [306], pp. 12.
11/ [271], pp. 9-19
12/ [272], pp. 5.
13/ [273], pp. 5.
14/ NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 38—Enrollment in Public and Nonpublic Schools in the United States: 1961-1980 (Thousands)

Year	Type of Control	
	Public	Nonpublic
1961	37,260 1/	—
1962	39,746 2/	—
1963	41,025 3/	—
1964	42,280 3/	6,700 4/
1965	42,835 3/	6,305 5/
1966	43,039 6/	6,700 7/
1967	43,892 6/	6,600 8/
1968	44,944 6/	6,000 9/
1969	45,619 6/	5,700 10/
1970	45,909 6/	5,732 6/
1971	46,081 6/	5,600 5/
1972	45,744 6/	5,100 1/
1973	45,429 6/	4,900 11/
1974	45,053 6/	4,700 2/
1975	44,791 6/	4,600 3/
1976	44,316 6/	5,300 12/
1977	43,731 6/	—
1978	42,900 6/	—
1979	41,578 13/	—
1980	40,700 13/	—

— Indicates data are not available.

SOURCES:

1/ [245], p. 31; p. 34.
2/ [247], p. 30; p. 42.
3/ [248], p. 36; p. 45.
4/ [297], p. 5.
5/ [302], p. 33-34.
6/ [250], p. 36-37.
7/ [298], p. Table 27.
8/ [299], p. 30; p. 34.
9/ [300], p. 31.
10/ [301], p. 31.
11/ [246], p. 31; p. 41.
12/ [249], p. 47.
13/ [252], p. 36; p. 50.

TABLE 39—Number of Public Elementary and Secondary Schools in the United States: 1960-1977

Year	Elementary Schools	Secondary Schools
1960 1/	91,853	25,784
1961	—	—
1962 1/	81,910	25,350
1963	—	—
1964 1/	77,584	26,431
1965	—	—
1966 1/	73,216	26,597
1967	—	—
1968 1/	70,879	27,011
1969	—	—
1970	—	—
1971 1/	65,800	25,352
1972	—	—
1973 2/	64,945	25,922
1974 1/	65,070	25,906
1975 3/	63,619	25,697
1976 1/	63,242	25,330
1977 1/	62,644	25,378

— Indicates data are not available.

SOURCES:

1/ [250], P. 61.

2/ [247], P. 53.

3/ [249], P. 62.

TABLE 40—Number of U.S. Public School Teachers: 1960-1978

Year	Total Teachers (Elementary and Secondary)
1960 1/	1,408,093
1961 2/	1,461,055
1962 2/	1,507,552
1963 2/	1,577,777
1964 2/	1,648,184
1965 2/	1,716,285
1966 3/	1,788,105
1967 4/	1,854,700
1968 5/	1,893,954
1969 5/	1,902,248
1970 5/	2,013,506
1971 5/	1,956,845
1972 6/	2,103,000
1973 7/	2,155,448
1974 8/	2,165,538
1975 8/	2,196,227
1976 8/	2,186,000
1977 7/	2,197,477
1978 7/	2,176,000

SOURCES:

1/ [261], P. 15.
2/ [262], P. 21.
3/ [263], P. 8.
4/ [264], P. 6.
5/ [285], P. 35.
6/ [286], P. 14.
7/ [250], P. 53.
8/ [288], P. 15.

TABLE 41—Expenditures of U.S. Public and Nonpublic Elementary and Secondary Schools: 1/ 1962-1981
(Billions of Current Dollars)

Year	Total Expenditures		
	All Schools	Public	Nonpublic
1962 2/	20.9	18.4	2.5
1963	--	--	--
1964 3/	20.9	21.5	3.0
1965 4/	26.7	23.6	3.1
1966 4/	29.7	26.3	3.4
1967 4/	31.8	28.3	3.5
1968 4/	37.0	33.0	4.0
1969 4/	39.6	35.5	4.1
1970 4/	45.4	40.8	4.6
1971 4/	49.3	44.3	5.0
1972 4/	53.7	48.1	5.6
1973 4/	58.0	51.9	6.1
1974 4/	63.8	56.9	6.9
1975 4/	68.4	61.1	7.3
1976 4/	75.0	67.1	7.9
1977 4/	81.6	72.7	8.9
1978 4/	90.8	81.5	9.3
1979 5/	97.6	86.8	10.8
1980 6/	107.1	95.4	11.7
1981 7/	116.3	103.5	12.8

— Indicates data are not available.

1/ Amounts are not strictly comparable: some figures include only expenditures for regular schools, some figures also include "other" schools (such residential schools for exception children, federal schools for Indians, etc.). When possible source footnotes explain the basis of the figures.

SOURCES:

2/ [298], p. 18. Excludes "other" schools.
3/ [300], p. 18. Excludes "other" schools.
4/ [280], p. 171-173.
5/ [250], p. 23. Includes "other" schools.
6/ [251], p. 23. Excludes "other" schools.
7/ [252], p. 18. Excludes "other" schools.

TABLE 42—Number of FTE Librarians Employed in U.S. Elementary and Secondary Schools: 1964-1982

Year	Number of Librarians (FTE) 1/			
	Public			Nonpublic Total
	Total	Elementary	Secondary	
1964 2/	23,586	—	—	—
1965	—	—	—	—
1966 3/	28,451	—	—	—
1967 4/	35,856	—	—	—
1968 5/	33,534	22,970	10,564	—
1969	—	—	—	—
1970 6/	39,753	25,171	14,582	—
1971 7/	43,912	—	—	—
1972 8/	41,477	29,142	12,335	—
1973	—	—	—	—
1974 9/	44,178	29,995	14,183	—
1975	—	—	—	—
1976 10/	47,411	35,528	11,883	—
1977	—	—	—	—
1978 11/	50,646	—	—	10,186
1979 11/	51,086	—	—	11,661
1980 11/	50,633	—	—	11,786
1981 11/	49,199	—	—	12,015
1982 11/	51,577	—	—	13,630

— Indicates data are not available.

1/ The number of FTE librarians/media specialists includes the 50 states and D.C. Statistics from the outlying areas (i.e., Guam, Puerto Rico) have been subtracted from the totals.

SOURCES:

2/ [310], pp. 35-36.
3/ [311], pp. 30-31.
4/ [307], p. 9.
5/ [312], pp. 30-31.
6/ [313], pp. 32-33.
7/ [308], p. 34.
8/ [293], pp. 34-35.
9/ [294], p. 32-33.
10/ [295], p. 34.
11/ NCES/OLLT Library Human Resources Employer Survey, 1982.

3.4 Special Library Employment

The term special library as used in this report covers a diverse group of libraries including special libraries serving business and industry, Federal libraries, special libraries serving State governments, State library agencies, and independent research libraries. Until now, there have been very few data collection efforts covering this group of libraries, either in total or in part.

The Employer Survey conducted as a part of this study obtained, for the first time, reliable estimates over time of the number of librarians employed in special libraries. These estimates are shown in Table 43. Obtained for an estimated universe of 7,350 libraries, the data suggest an average of about 2.5 librarians per library in 1982.

The number of librarians in special libraries increased about 19 percent over the 1978-1982 period, equivalent to an average annual increase of about 4 percent. The number of special libraries appears to be closely related to research and development funding, and this variable was used in projecting the demand for special librarians. Results as shown in Table 43 suggest a continued increase in the demand for special librarians to a range of 22,000 to 24,000 in 1990. This is an eight year increase of 19 to 27 percent, equivalent to average annual increases of 2 to 3 percent.

3.5 Employment of Non-Library Information Professionals

The development in the last decade of the information professional concept has been a major change in the library profession. Existing programs have incorporated the concept and new programs have been developed to train individuals for information positions outside the traditional library environment.

The Occupational Survey of Information Professionals (OSIP), performed by the University of Pittsburgh and King Research, Inc., estimated for the first time the number of information professional positions in the U.S. [40]. In all, a total of 1.6 million information professionals

TABLE 43—Number of FTE Librarians Employed in U.S. Special Libraries, with Projections 1/: 1978-1982 and 1983-1990

Year	Number of Special Librarians
1978	15,600
1979	17,100
1980	17,500
1981	17,700
1982	18,600

Projections

Year	Low	Intermediate	High
1983	19,900	19,100	19,200
1984	19,400	19,600	19,800
1985	19,900	20,200	20,400
1986	20,300	20,700	21,000
1987	20,700	21,200	21,700
1988	21,200	21,800	22,300
1989	21,700	22,400	23,000
1990	22,100	22,900	23,700

1/ From NCES/OLLT Library Human Resources Employer Survey, 1982. Projections developed by King Research, Inc.

were estimated for 1980, including 160 thousand in the library workfield and 126 thousand in library subunits. The number performing library functions, that is, in the library workfield, but not employed by a library subunit was about 48,000. This is a reasonable estimate of the non-library demand which could be met by library school graduates. OSIP did not collect data over time, so there is no way to project the figure of 48 thousand beyond 1980. It is generally felt that such positions are increasing, certainly more rapidly than the number of library positions.

How many of the 48,000 non-library information professional jobs in 1980 were held by individuals with library degrees or certificates? OSIP did not investigate this, and the only related data over time reflect the library program graduates going into non-library information professional positions. These data are shown in Table 44. Results represent the aggregate for all degree and certificate recipients but are similar for the different programs. As indicated, the proportion of library program graduates going to non-library information professional positions has increased modestly, but the absolute numbers suggest that only a small percent of all positions in 1980 were held by graduates of library schools. In the one year of data available from the Employer Survey (1982), there were 1,470 individuals transferring from library to non-library information professional positions and 940 moving in the other direction, for a total net transfer to information professional employment of 530 (see Table 19). Combined with new graduates going into such positions, the total movement is thus about 800 individuals.

Based on the above, one might assume that non-library information professional positions in the future would be filled primarily by other than library program graduates, with the number filled by library program graduates increasing in absolute terms but not increasing relative to total employment. This would be based solely on historical data, and not take into account new programs designed specifically to prepare the information professional. Looking at specific library school programs, some respondents to the Library Human Resources Survey indicated as much as 18 percent of their 1981 graduates going to non-library positions. Increases over the

TABLE 44—Employment of Library Program Completions as Non-Library Information Professionals: 1976-1981 1/

Year	Number Employed	Percent of All Graduates
1977	360	3.6
1978	330	3.5
1979	330	3.8
1980	290	3.8
1981	270	3.9

1/ From NCES/OLLT Library Human Resources Library School Survey, 1982.

TABLE 45—Librarian Separations: 1977-1980 and 1980-1981 (Percent of Previous Year's Employment)

	Current Status				
	Employed				
Years	Same Occupation	Different Occupation	Unemployed	Not in Labor Force	Total
1977-1978 1/	90	4	*	5	100
1980-1981 1/	87	5	1	7	100
1980-1981 2/	92	2	1	5	100

* Less than 1 percent.

1/ Unpublished data provided by Alan Eck, Bureau of Labor Statistics, based on sample of librarians who are college graduates.
2/ From NCES/OLLT Library Human Resources Employer Survey, 1982.

1977-1981 period have been significant as well, suggesting that the proportion will continue to grow and could reach as high as 40-50 percent for individual programs by 1990.

Rather than estimate the number of library program graduates going to non-library information professional positions based on such limited data, we have developed demand estimates without taking these positions into account. It is important to note that excess of supply over demand, using this approach, reflects graduates who would be available for such positions. This assumes -- inaccurately we believe -- that library positions would be filled before non-library ones, but does allow us to readily observe the effect of different projections of non-library demand. More structure in and investigations into the information professional field over time should make projecting this demand an easier task in the future.

3.6 Replacement Demand

Replacement demand reflects deaths and retirements by individuals in library positions, other labor force departures, and occupational transfers. In the Library Human Resources Survey, this would include all librarians identified as leaving library employment (see Table 17) who did not go on to other library employment. The estimated number of such individuals in 1981 was 10,930, including 2,540 who took other employment and 8,390 who were not employed. Data for the latter estimate were collected in the categories: returned to school, unemployed but actively seeking work, not employed and not seeking work, died, and unknown or other.

Another source of comparable data on replacement demand is the accession and separation data provided by the Bureau of Labor Statistics. These data are developed from retrospective occupational mobility data and matched data from different Current Population Surveys [239]. Separation data, which show proportions of people employed the previous year according to their current labor force status, are available for librarians for 1978 and 1981 and are shown in Table 45, along with the data from the Library Human Resources Employer Survey.

From the separation data, we find that about 5-7 percent of employed librarians left the labor force in the years for which there are data. About 1 percent became unemployed and were seeking work, and 2-5 percent transferred to other occupations. The BLS separation data may show a higher rate of occupational transfer because some interlibrary transfers are included. The total separation percentage is an estimated 8-13 percent.

One component of labor force departures, deaths and retirements, can be estimated independently using worklife expectancy tables [131] applied to data on the number of librarians in various age groups. Worklife expectancy models and projection methods have recently been revised, and reflect the observed increase in women's worklife expectancies. While only limited data are available on age distributions of librarians, primarily from the ALA and SLA surveys [45,132-142], application of worklife tables to available age distribution data also suggests that 4 percent of the employed population is a reasonable estimate of the death and retirement rate for librarians. This group would be found primarily in the category "not in the labor force" in Table 45.

No other data are available for estimating librarian replacement demand. Based on what is known, an estimate of 10 percent of the previous year's employment is used in the remainder of this report. This figure is taken as including 4 percent deaths and retirements, 4 percent occupational transfers, and 2 percent other labor force departures.

CHAPTER 4

PROJECTIONS OF SUPPLY

by
Nancy A. Van House

The supply of librarians is the pool of qualified individuals available to fill librarian positions. Current supply consists of librarians currently employed plus those unemployed but still in the labor force, that is, actively seeking work. Additional supply from one year to the next consists of new graduates of library education programs who seek to enter the library labor force, plus others not employed as librarians but seeking work in the field. Those among the additional supply who do obtain employment as librarians become additions to supply. Losses from supply are those individuals who leave the labor force, die, or change occupations. This chapter deals with librarian supply primarily by estimating additions to supply.

The major component of new supply is graduates of library programs, including those granting MLS and BLS degrees and those preparing individuals for school library certification. Data on program completions for 1978 through 1981 and projections through 1990, as described in this chapter, are shown in Table 46.

Program completions have been decreasing in all areas in recent years, with an overall decrease of 35 percent between 1978 and 1982. This is equivalent to an average annual decrease of 10 percent. The picture shows an increase, however, for MLS graduates over the 1982 through 1986 period, with an increase of 8 percent (equivalent to 2 percent annually) projected. In the late 1980's, the number of MLS degree recipients is expected to continue to increase at a rate of 12 percent (equivalent to 3 percent annually). For BLS degree graduates, the current decreases are

Table 46--Graduates of Library Education Programs, by Type of Program, with Projections: 1978-1990

Year	Type of Program: MLS Degree (Accredited Programs)	MLS Degree (Nonaccredited Programs)	BLS Degree	School Library Certification	Total
1978	5,500	1,180	420	2,380	9,480
1979	5,050	1,040	400	2,190	8,680
1980	4,510	780	370	1,980	7,640
1981	4,200	770	310	1,700	6,980
Projections					
1982	3,710	560	330	1,570	6,170
1983	3,700	560	290	1,440	5,990
1984	3,770	570	260	1,330	5,930
1985	3,860	580	240	1,230	5,910
1986	4,020	600	210	1,130	5,960
1987	4,180	630	190	1,040	6,040
1988	4,310	650	170	960	6,090
1989	4,450	670	160	880	6,160
1990	4,490	670	140	820	6,120
Percentage Increases					
1978-1982	-33	-53	-21	-34	-35
1982-1986	8	7	-36	-28	- 3
1986-1990	12	12	-33	-27	3

1/ NCES/OLLT Library Resources Library School Survey, 1982. Projections developed by King Research, Inc.
2/ Year reflects end of academic year, e.g., 1978 is 1977/78 academic year.

expected to continue through the 1980's until there are fewer than 150 graduates in 1990. Data in the table on school library certifications reflect only those students completing programs which prepare them for school library certification without also requiring a BLS or MLS degree. The number in this group has decreased in the 1978-1982 time period, and completions are expected to continue to decrease. The combined picture of MLS, BLS and school library certificate completions shows a small projected increase in 1982-1986 and a small projected decrease in 1986-1990.

4.1 Current Supply

The Library Human Resources Survey results indicate that 136,000 librarians are currently employed (see Table 12). Because employers, not individuals, were surveyed, there is no direct information on the unemployment rate among librarians. The Current Population Survey estimates unemployment by occupation; Table 4 showed its figures for librarians and related occupations. In 1980, the last year for which data are available, the CPS unemployment rate for librarians was 1.5 percent. However, the CPS data suffer from several shortcomings. First, librarians are such a small part of the CPS sample that the figures for them are subject to high sampling error. Second, the CPS definition of an unemployed librarian is someone who is not currently working, is actively seeking work, and whose previous employment was as a librarian. That eliminates all new graduates and all librarians who have worked or are working at other jobs, such as those that need a source of income while they search for a library position. Finally, the CPS relies on self-reporting: many who report themselves as librarians may not fit the definition.

Another source of information on unemployment is the Library School Survey (see Table 26). At the time of the survey, 4 percent of 1981 graduates were unemployed and seeking work. Another 4 percent were under-employed in non-professional library positions. An additional 6 percent were employed neither in libraries nor in non-library information positions; an undetermined proportion of these are probably in jobs not

related to their education taken out of necessity rather than choice. That gives us a maximum of 14 percent of 1980/81 graduates in the labor force but employed neither as librarians nor as non-library information professionals.

Unemployment is likely to be greater among new graduates than among experienced librarians. The implication is that the unemployment rate for the library labor force generally is somewhere between the CPS' 1.5 percent and the Library School Survey's maximum of 14 percent, or between 2,000 and 17,000 individuals, a rather wide range. A reasonable estimate would be an unemployment rate of 6 percent, or 9,000 individuals.

Among librarians, as in other occupations, there exist workers who are termed "discouraged workers." Those are individuals who have despaired of finding an information-related job and who have ceased looking or taken other employment and therefore are not counted as part of the information labor force.

Besides discouraged workers there are some librarians who are underemployed. That is, they are employed in part-time, temporary, or nonprofessional library positions, because they cannot find the kind of job they prefer. Evidence for librarian underemployment comes from the annual LJ survey of new graduates, which includes a count of individuals employed in part-time and temporary professional positions and in non-professional positions in libraries.

Unfortunately, even if the number of individuals with MLS degrees who are not currently working because they are discouraged, or who are not working as professional librarians, could be estimated, there would be no way of knowing how many would reenter the library labor market if the market were to improve. This study's estimate of the current librarian labor force, therefore, must consist solely of those employed plus those unemployed and actively seeking work.

4.2 Supply of Additional Librarians

The supply of additional librarians includes new graduates of library education programs who seek library positions, former librarians wishing to reenter the profession, graduates of past years now wishing to enter the profession, and those in other fields who want to transfer to library positions. Data are available on the number of new graduates, but not on the numbers of other individuals mentioned that are looking for library employment. These groups can only be estimated from the number of individuals in these categories who are successful in obtaining work -- groups termed reentrants, delayed entrants, and occupational transfers. Reentrants are people who have left the labor force temporarily, but are now returning. Delayed entrants are those who did not enter the labor force immediately upon graduation from a library education program, but do so at a later time. Occupational transfers are individuals who were employed in another occupation and change occupations without going through a library education program. Clerical and technical staff promoted to librarian positions are included in this last category (see Table 16).

4.2.1 New Graduates

Newly graduated librarians come from several different kinds of educational programs. The Master of Library Science (MLS) degree 1/ is considered the usual educational requirement for librarians in most types of libraries: the American Library Association (ALA) only accredits MLS programs. The MLS is also the most commonly awarded degree: 71 percent of the people completing library education programs in 1980/81 were MLS graduates (see Table 46).

Not all MLS programs are accredited by the American Library Association. Our information indicates that of the 113 master of library

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1/ The name varies slightly among schools: e.g., Master of Library and Information Studies, Master of Library and Information Science, Master of Science in Library Science. See footnote on page 32.

science programs surveyed, 61 were ALA-accredited. In 1980/81, 18 percent of MLS graduates were from nonaccredited programs.

The next most common educational qualification is the school library certificate. In most states, school librarians must be certified. Many students simultaneously meet the requirements for an MLS degree and a school library certificate; in the survey results reported in this study these individuals are counted under Master of Library Science. Some programs, though, only prepare their students to meet the certification requirements; the students receive no degree or a degree in another subject, often in education. In 1980/81, those people completing school library certificate programs without completing other library education programs were 24 percent of total library program completions (see Table 46).

Some Bachelor of Library Science (BLS) programs exist; Table 46 shows that the number of BLS graduates is small and declining.

Several methods can be used to project the numbers of graduates. The method used here is to project degrees as a function of market conditions in librarianship. Appendix C discusses the basis for this approach in greater detail. Briefly, it has been shown [58-66, 3, 71, 316] that among the potential entrants to an occupation there are marginal decision-makers who are affected by changes in relative salaries. That is not to say that salary is the only consideration; only that individuals consider the total monetary and non-monetary benefits of an occupation. If individuals are willing to enter an occupation with relatively low salaries, it is because, for that person, the non-monetary benefits of that occupation (e.g., interest in and satisfaction with the work) are greater than in some occupations with higher monetary benefits. Changes in monetary benefits, will of course, alter some people's decisions. These benefits, in turn, will be affected by market conditions, including the demand for, and the supply of librarians. An increase in demand with no increase in supply will tend to inflate salaries; an increase in supply with no increase in demand will depress salaries.

The approach used here to simulate supply relies on multiple regression models in which supply -- taken to be new graduates -- is related to salaries, and salaries to market conditions. Then projections of market conditions are used to generate projected salaries, which are in turn used to project graduates. The advantage to that method is that it relates occupational supply to external events. To the extent that one can project changes in those external events, one can project changes in supply. Furthermore, by describing the relationship between supply and exogenous variables the regression method identifies factors that should be watched. Changes in these variables anticipate changes in the librarian market. The model can therefore serve as a kind of early warning system.

Projections require retrospective data to establish relationships and trends. Although the amount of data on library education programs is increasing, and the Library School Survey is a major addition, very little information is available for earlier years. The major source of retrospective data on library education is the annual LJ survey. Because those data apply only to ALA-accredited MLS programs, our approach has been first to project degrees from these programs and then to address completions in other library education programs as a function of MLS's from accredited programs and past trends.

Projecting the additions to supply from accredited MLS programs requires projections first of the number of graduates, and second of the proportion of them who will enter the library market. After testing a large number of formulations of the basic Freeman model as applied to librarianship, it was concluded that graduates from accredited library school programs (Figure 2) are a function of starting salaries (Figure 3) and of the number of Master's degree recipients in all fields. NCES projects Master's degrees; to project graduates, projections of librarian starting salaries are also needed.

Three alternative projections of graduates were developed based on three different sets of assumptions about starting salaries. Appendix C contains the detailed assumptions and methods. The high alternative is

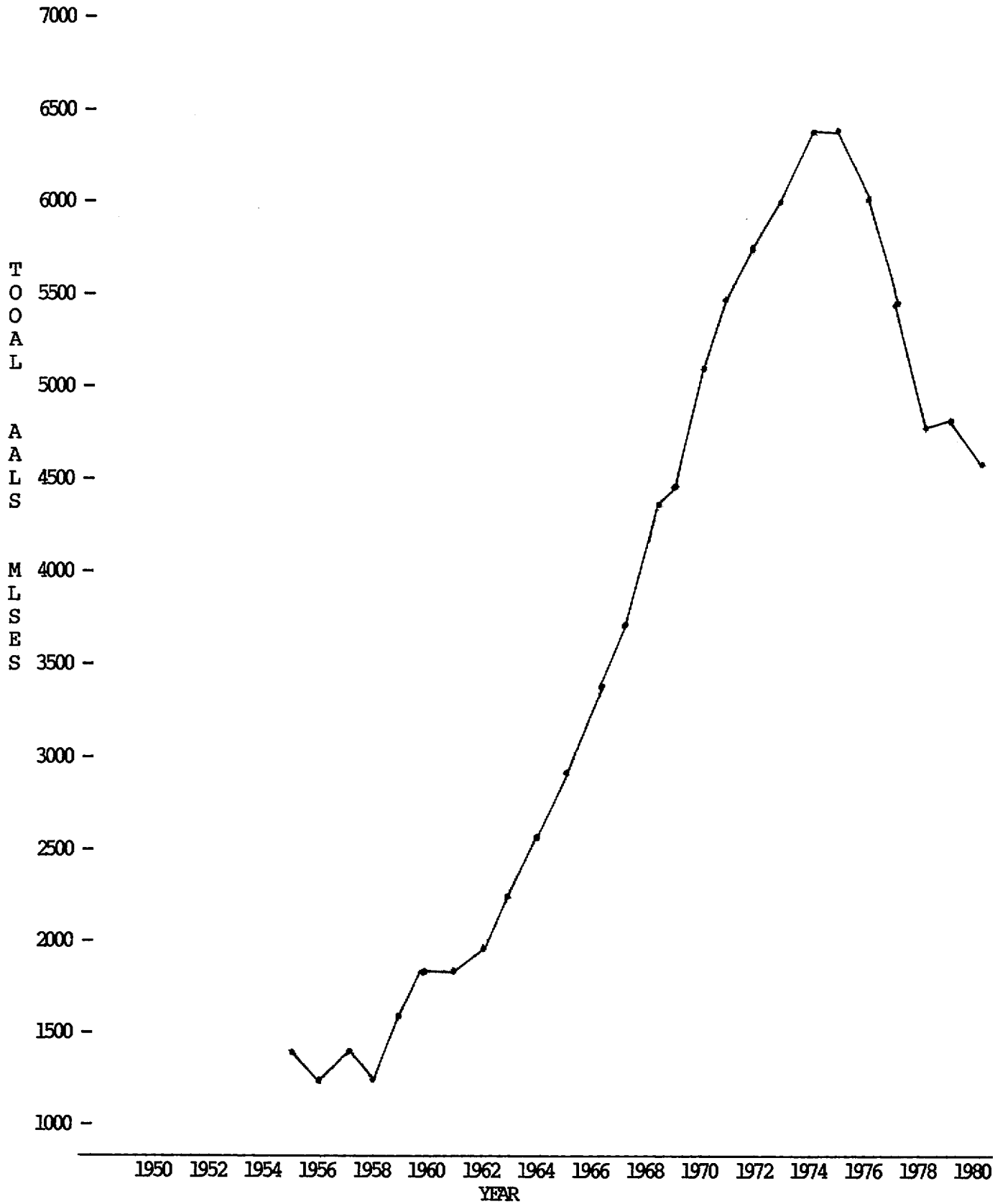

Figure 2. Accredited MLS Degrees by Year

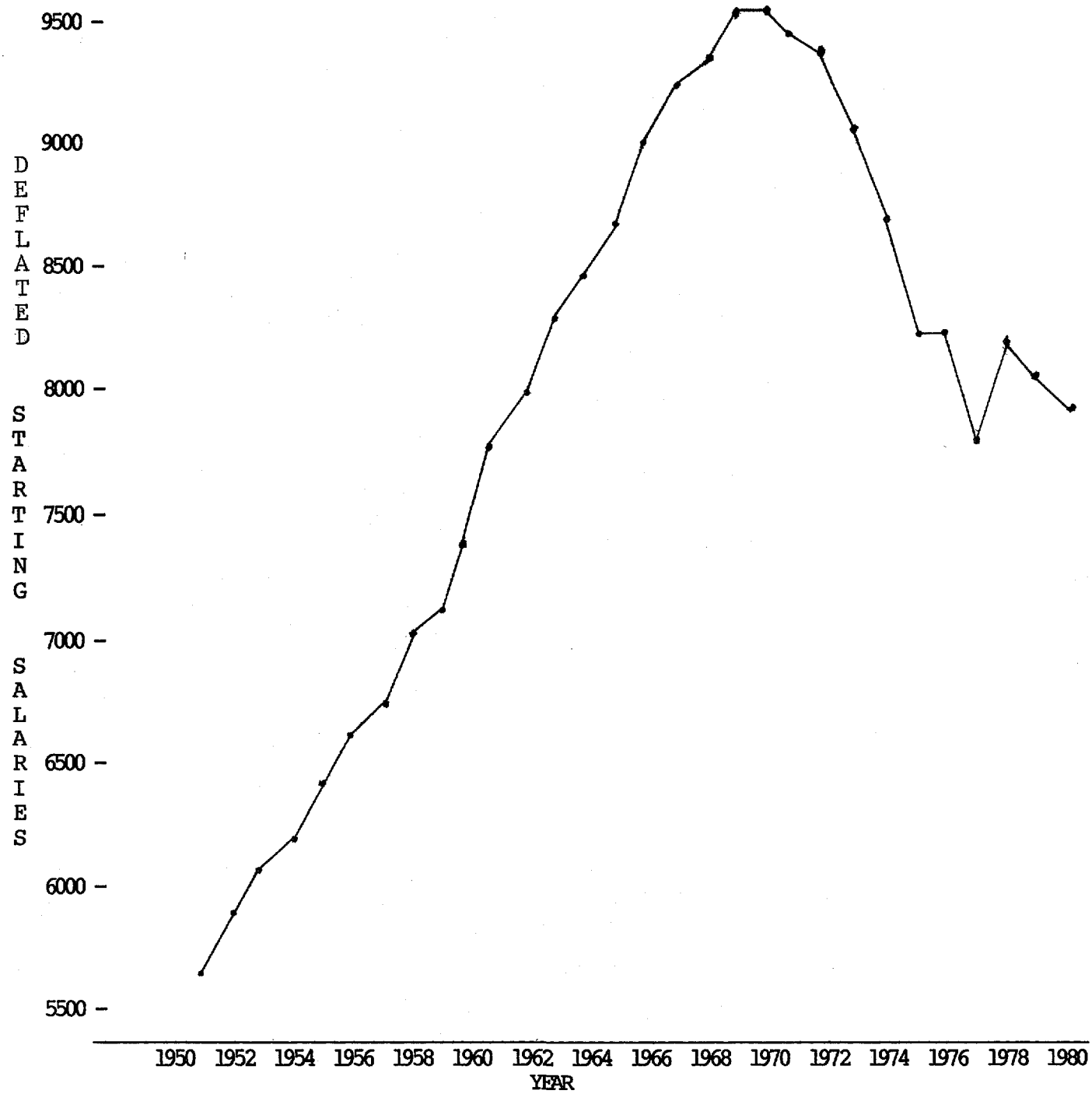

Figure 3. Librarian Starting Salaries by Year

based on a regression of changes in librarian starting salaries on changes in professional women's salaries, the number of past MLS graduates, and state and local government expenditures on libraries, all factors that provided a good explanation of past starting salaries for librarians. The low alternative assumes that librarian starting salaries will remain approximately constant, halting the decline of the 1970's. The intermediate alternative varies the asssumptions with a slower rate of growth for library expenditures and constant professional women's salaries. Tables 47 and 48 present the alternative graduate and salary projections.

Once the number of graduates has been projected, how many of them will actually enter the library labor market must be decided. Even in the 1950's, when librarians were in great demand, not all MLS graduates immediately entered the library labor force. Some may have never wanted to be librarians; some may have changed their minds once they finished their degrees; some may have delayed their entry for personal reasons. Furthermore, the overwhelming majority of library school graduates have always been women, and women have historically had lower labor force participation rates than men. Educated women, however, have always had higher than average participation rates and MLS-holders are by definition well-educated.

The LJ survey has reported the proportion of graduates placed in library positions since 1964, when by all indications the market for librarians was still strong. At that time, 94 percent of those whose placement was known were in libraries (see Table 1). Since that time, two major trends have tended to reduce the library placement rate. One is that the market worsened, making it more difficult for graduates to find library positions. The other, more recent, trend is the growing importance of non-library information professional work. During the last few years the proportion of those whose placement is known who have been placed in libraries has hovered around 80 percent. When the market was at its worst, in the mid-1970's, the figures dropped to 76 percent. That it has climbed since, as the market has improved, indicates that the reduction is not due exclusively to an increase in the proportion of graduates choosing non-library information positions.

TABLE 47--Alternative Projections of Graduates of Accredited MLS Programs: 1982-1990 1/

Year	Alternative Graduate Projections		
	Low	Intermediate	High
1982	3,170	3,710	3,710
1983	3,690	3,700	3,650
1984	3,740	3,770	3,750
1985	3,790	3,860	3,870
1986	3,910	4,020	3,810
1987	4,020	4,180	4,360
1988	4,040	4,310	4,580
1989	4,130	4,450	5,230
1990	4,130	4,490	5,770

1/ Projections developed by King Research, Inc., Library Human Resources Study, 1982.

TABLE 48--Alternative Projections of Librarian Starting Salaries: 1981-1990 1/ (1981 dollars)

Year	Alternative Salary Projections		
	Low	Intermediate	High
1981	$15,597	$15,597	$15,597
1982	16,970	17,100	16,530
1982	17,910	18,200	18,620
1984	18,270	18,710	20,500
1985	14,831	20,470	24,960
1986	21,480	22,360	28,400
1987	22,030	23,090	31,570
1988	22,360	23,580	34,610
1989	22,560	23,890	37,460
1990	22,650	24,050	40,780

1/ Projections developed by King Research, Inc., Library Human Resources Study, 1982.

Given that the MLS is a professional degree, which people are unlikely to pursue out of sheer interest in the subject with no thought of future employment, and that women's labor force participation rates are considerably higher now than they were in the 1960's [131], it is reasonable to expect that about 95 percent of those receiving MLS degrees will enter the information market. That is, these individuals will want and actively seek jobs in libraries or other information agencies. That supposition is based on the early-1960's rates. The remaining 5 percent will go into other occupations, delay their entry into the labor force, continue to study, and so forth. That does not say that all 95 percent will find jobs; far from it. Rather it says that 95 percent will actively seek information-related work and will take it if they can get it, i.e., they will be additional supply. An undetermined proportion of those actively seeking information work will, however, fail to find employment and some will eventually become discouraged and leave the information labor market. But if they could find appropriate employment, 95 percent of the graduates of accredited MLS programs would take it.

Some of those who enter the information profession will want library jobs, and some will want non-library information professional jobs. All will be qualified to take library jobs, at least on paper, since all will be by definition graduates of ALA-accredited library programs. In practice, some may pursue courses of study that effectively qualify them only for non-library positions. It is impossible at this point, though, to segment the new supply into library and non-library. Given the amount of movement between library and non-library organizations revealed by the employer survey (see Table 19), it appears that there is one market, and not two, for MLS graduates.

Because retrospective data for a significant period of time are available only for accredited MLS programs, the supply model projects only those graduates. New entrants also come from nonaccredited MLS, school library certifications, and Bachelor of Library Science (BLS) programs.

Little information is available about nonaccredited MLS programs.

The Library Human Resources Survey data show the ratio of degrees from nonaccredited to accredited programs holding at about 15 percent from 1977 through 1980. Lacking any evidence that that rate is changing, degrees from nonaccredited programs are projected as 15 percent of accredited, and the same 95 percent labor market entry rate is applied to them.

4.2.2 School Library Certificates

In general, the qualification for employment in a public school library is certification as a librarian by the State Department of Education. Requirements for certification vary from state to state and may include a Bachelor's or Master's degree (in library science, education, instructional technology or a related field) [48]. In other cases, coursework but no library degree is required. For this study, school library certificates refer to those who have state certification to work in a school library/media center, but lack a library science degree.

Data are not available on the total number of school library certifications granted. It is known that in 1981 some 11,000 people were hired by school libraries, including about 5,000 new graduates. It would be reasonable to assume that most of these 5,000 were recently certified. The total number of certifications annually is probably larger than this number, since multiple certifications are not uncommon and some who are "library certified" will teach.

Current employment in school libraries (1982) is about 66,000. Again, it can reasonably be assumed that most of these individuals are certified. Of the 66,000, about 55,000 or 83 percent have some type of library degree or certification. Seventy percent have a library degree and the remaining 13 percent have certification but no library degree.

Data on certified individuals who also have library degrees could not be separately broken out of the total estimates of degree recipients. To obtain data on those certified but not degreed, library schools were asked to report these numbers separately. The results obtained are

presented in Table 49 and show a steady decrease. Over the five year period, the average annual decrease was about 10 percent.

One approach to projecting school library certificate completions is to anticipate a continued decrease at the current rate, that is, 10 percent a year. This is shown in Table 49 as the low estimate. An alternate approach is to relate certificate completions to degrees in Education, assuming that the proportion of Education degree recipients receiving library certification over time will remain fairly constant (as has been true for the last five years). Based on this relationship, the decline in library certificate completions is estimated at six percent per year. Projections based on this rate are given in Table 49 as the high estimate, and an intermediate projection is established as the average of the high and the low.

4.2.3 Bachelor of Library Science Degrees

The major sources of data on Bachelor of Library Science (BLS) degrees are the Library School Survey and NCES' survey of earned degrees conferred, which overlap in 1977 and do not agree (Table 50). However, by any measure BLS degrees are few and becoming fewer. Between 1977 and 1980 BLS degrees decreased by approximately 10 percent per year. At that rate, by 1990, only about 150 BLS degrees will be awarded each year.

4.2.4 Reentrants, Delayed Entrants, and Occupational Transfers

Some of the entrants to the pool of employed librarians do not come directly from library programs but rather from another occupation or a period of not working. The latter would include those outside the labor force (retired, caring for family members, etc.) in addition to those unemployed. Those most recently not in the labor force (but not in school) are called reentrants or delayed entrants depending on whether they have ever been in the labor force. Occupational transfers are individuals coming directly from employment in another profession.

TABLE 49—School Library Certificate Program Completions, with Alternative Projections: 1977-1990 1/

Year	School Library Program Certificate Completions
1977	2,620
1978	2,380
1979	2,190
1980	1,980
1981	1,700

Projections

Year	Low	Intermediate	High
1982	1,530	1,570	1,600
1983	1,380	1,440	1,500
1984	1,240	1,330	1,410
1985	1,120	1,230	1,330
1986	1,010	1,130	1,250
1987	900	1,040	1,170
1988	810	960	1,100
1989	730	880	1,030
1990	660	820	970

NOTE:
Includes only individuals prepared for school library certification but not receiving library degree.

1/ NCES/OLLT Library Human Resources Library School Survey, 1982. Projections developed by King Research, Inc.

TABLE 50—Bachelor of Library Science Degrees Awarded: 1960-1981

Year	NCES 1/	Library School Survey 2/
1960	429	—
1961	439	—
1962	423	—
1963	462	—
1964	510	—
1965	623	—
1966	642	—
1967	701	—
1968	814	—
1969	1,000	—
1970	1,054	—
1971	1,013	—
1972	989	—
1973	1,159	—
1974	1,164	—
1975	1,069	—
1976	843	—
1977	781	480
1978	693	420
1979	—	400
1980	—	370
1981	—	310

— Indicates data are not available.

SOURCES:
1/ [280].
2/ NCES/OLLT Library Human Resources Library School Survey, 1982.

To obtain an indication of the number of reentrants, delayed entrants, and occupational transfers, we look at accession data provided by the Bureau of Labor Statistics. These data are derived in the same manner as the separation data discussed in Chapter 4. The accession results which are shown in Table 51, reflect the proportion of people employed as librarians in a given year (1978 and 1981) according to their previous year's status. Table 51 also gives comparable results from the Employer's Survey for 1980-1981.

Table 51 shows that about 6 percent of librarians employed in 1981 were not in the labor force in the previous year. About 4 percent, according to the Library School Survey, were new graduates of library school programs. The difference, 2 percent, is one component of the supply of additional librarians. To this 2 percent is added the 1 percent previously unemployed and the 3-4 percent who are transfers in from other occupations. The total is then in the range of 6-7 percent of all librarians. For purposes of the model presented in Chapter 5, this category of additions to supply is taken as 7 percent of all librarians.

4.3 Future Supply

Projections for each of the categories of library program graduates are given in Table 52, and projections of resulting potential labor market entrants (95 percent of graduates, as discussed above) are given in Table 53. Of the three alternative sets of projections, the high alternative is the least likely. It assumes that library expenditures will increase substantially, so that librarian salaries will increase, and with them, graduates. The experience of the 1970's indicates otherwise.

The intermediate alternative is cyclical. The decline in graduates in the 1970's is, according to this model, about to begin to turn salaries back up. That will in turn increase the number of graduates beginning in the mid-1980's. Under this alternative, the market will continue to oscillate indefinitely. What saves it from being a closed system, simply bouncing up and down, is the effect of the exogenous variables: other

TABLE 51--Librarian Accessions: 1977-1978 and 1980-1981
(Percent of Current Year's Employment)

Year	Previous Status: Employed, Same Occupation	Previous Status: Employed, Different Occupation	Previous Status: Unemployed	Previous Status: Not in Labor Force	Total
1977-1978 1/	87	7	1	4	100
1980-1981 1/	89	4	1	6	100
1980-1981 2/	89	3	1	6	100

1/ Unpublished data provided by Alan Eck, Bureau of Labor Statistics, based on sample of librarians who are college graduates.
2/ NCES/OLLT Library Human Resources Employer Survey, 1982.

TABLE 52--Projected Library Education Program Completions; High, Intermediate, and Low Alternatives: 1982-1990 1/

Year	MLS Degrees			School Library Certificate	Total
	Accredited	Nonaccredited	BLS		
			High Alternative		
1982	3,710	560	330	1,600	6,200
1983	3,650	550	290	1,500	5,990
1984	3,750	560	260	1,410	5,980
1985	3,870	580	240	1,330	6,020
1986	3,810	570	210	1,250	5,840
1987	4,360	650	190	1,170	6,370
1988	4,580	690	170	1,100	6,540
1989	5,230	780	160	1,030	7,200
1990	5,770	870	140	970	7,750
			Intermediate Alternative		
1982	3,710	560	330	1,570	6,170
1983	3,700	560	290	1,440	5,990
1984	3,770	570	260	1,330	5,930
1985	3,860	580	240	1,230	5,910
1986	4,020	600	210	1,130	5,960
1987	4,180	630	190	1,040	6,040
1988	4,310	650	170	960	6,090
1989	4,450	670	160	880	6,160
1990	4,490	670	140	820	6,120
			Low Alternative		
1982	3,710	560	330	1,530	6,130
1983	3,690	550	290	1,380	5,910
1984	3,740	560	260	1,240	5,800
1985	3,790	570	240	1,120	5,720
1986	3,910	590	210	1,010	5,720
1987	4,020	600	190	900	5,710
1988	4,040	610	170	810	5,630
1989	4,130	620	160	730	5,640
1990	4,130	620	140	660	5,550

1/ Projections developed by King Research, Inc., Library Human Resources Study, 1982.

TABLE 53--Projected Library Labor Force Entrants from Library Program Completions; High, Intermediate, and Low Alternatives: 1982-1990 1/

Year	MLS Degrees		BLS	School Library Certificate	Total
	Accredited	Nonaccredited			
		High Alternative			
1982	3,530	530	330	1,520	5,910
1983	3,470	520	290	1,430	5,710
1984	3,560	530	260	1,340	5,690
1985	3,770	570	240	1,260	5,840
1986	3,620	540	210	1,190	5,560
1987	4,140	620	190	1,110	6,060
1988	4,350	650	170	1,050	6,220
1989	4,970	750	160	980	6,860
1990	5,480	820	140	920	7,360
		Intermediate Alternative			
1982	3,530	530	330	1,490	5,880
1983	3,530	530	290	1,370	5,720
1984	3,580	540	260	1,260	5,640
1985	3,670	550	240	1,170	5,630
1986	3,820	570	210	1,070	5,670
1987	3,970	600	190	990	5,750
1988	4,100	620	170	910	5,800
1989	4,230	640	160	840	5,870
1990	4,270	640	140	780	5,830
		Low Alternative			
1982	3,530	530	330	1,450	5,840
1983	3,510	530	290	1,310	5,640
1984	3,550	530	260	1,180	5,520
1985	3,600	540	240	1,060	5,440
1986	3,720	560	210	960	5,450
1987	3,820	570	190	860	5,440
1988	3,840	580	170	770	5,360
1989	3,920	590	160	690	5,360
1990	3,920	590	140	630	5,280

1/ Projections developed by King Research, Inc., Library Human Resources Study, 1982.

salaries in the economy, graduates of all Master's programs, and expenditures on libraries. These variables moderate the link between graduates and salaries in librarianship. The intermediate alternative is, in our estimation, the one most likely to occur.

The low alternative is the most pessimistic. It assumes constant real salaries which result in little change in the number of graduates.

The links between graduates and salaries, and between salaries and the economy, make projections particularly difficult at this time when the economy is unsettled. The economic projections in this report are based on those made by the Bureau of Labor Statistics and the National Center for Education Statistics.

None of these alternatives is tied to a particular set of assumptions about the demand for librarians. Surprisingly, while a close connection between graduates and salaries was found there was no statistical relationship between demand and salaries. This is discussed further in Appendix C. It appears that librarian salaries are not determined by relative supply and demand in the library market. That may explain why the shortage of librarians of the 1950's persisted for so long; despite the shortage, salaries remained too low to attract enough entrants.

None of these alternatives makes any explicit assumptions about the effect of the increasing emphasis on non-library information management on library education. Quantitative projections can only be based on past trends, so the past effect of the growth of the field of information management on library education is incorporated in all these alternatives. Another way to put this would be to say that the projections made here are primarily for the library market; to the extent that library science programs succeed in attracting more students interested in careers outside of libraries and in placing more graduates of those programs in organizations other than libraries, the projections made here will be underestimates. Under any but the high alternative the market for library education remains fairly weak.

The placement data from the Library School Survey indicate that non-library information professional positions are a significant but not major market for new graduates. The Employer Survey data suggest that many librarians are moving from libraries to other agencies. Part of the problem may be that library schools are continuing to attract students who come to them specifically because they want to work in libraries; experienced librarians seem willing and able to make the switch out of libraries.

CHAPTER 5

OUTLOOK AND IMPLICATIONS

The overall picture of the demand for librarians, as presented in Chapters 2 and 3, shows the number of positions increasing modestly into the early 1980's and then declining slightly to 1990. Thus the decade of the 1980's is expected to show an even smaller increase in librarian employment than the rather stable 1970's, with no anticipated return to the boom period of the 1960's. The effect of the employment patterns anticipated is that most job openings created in the 1980's, especially in the later part of the decade, will occur as a result of retirements and deaths rather than new positions.

As the number of jobs stays fairly constant in the 1980's, the number of individuals completing library education programs and seeking employment is also projected to remain fairly constant through the decade. MLS degrees from accredited programs are expected to reverse their decline of the 1970's and begin to increase again, but not rapidly; by 1990 the number of degrees will be the same as in 1969. MLS degrees from nonaccredited programs will follow the same pattern. School library certificates and BLS's, however, will decline steadily, offsetting the increase in the other areas. By 1990, our projections indicate that the mix of library program completions will have changed from 59 percent for accredited MLS programs to 73 percent. These data were presented in Chapters 2 and 4.

While only very small changes are projected in the number of graduates of library education programs and in librarian employment, differences in the rates of change suggest that the job market will improve modestly in the 1982-1986 period and then tighten in the latter part of the decade. This statement reflects the job market for traditional librarians, and could be counteracted by increasing movement of library program graduates to non-library information professional positions.

How does the employment picture for librarians compare with that for other professionals? In contrast to the anticipated growth rate of 5 percent for librarian employment between 1980 and 1990, employment is projected to increase 19 percent for elementary school teachers, 23 percent for social workers, and 71 percent for systems analysts. Employment of college teachers, on the other hand, is expected to decline by 12 percent and employment of secondary school teachers by 14 percent. Employment of professional and technical workers generally is projected to increase by 22 percent [239].

Employment projections for professionals, as well as for librarians, reflect only total demand. For a true picture of the future library labor market, it is also necessary to examine the relationship of supply to demand. Table 54 illustrates this relationship for librarians through 1990, reflecting total employment, job openings and the additional supply of librarians. The data for the 1978-1982 period are based on survey results from library schools and librarian employers. Data for the two periods 1982-1986 and 1986-1990 are based on projections developed as a part of this study. In the table, total employment is indicated and then the number of job openings within the total employment is given in terms of additional positions created and positions available due to individuals leaving library employment.

The new supply of librarians is expressed in the table as including graduates of library education programs and a category identified as other additions. Other additions include individuals obtaining library employment who have previously been unemployed and seeking work, otherwise not employed, or working at another occupation; that is reentrants, delayed entrants and occupational transfers. Strictly speaking, this category should include both individuals obtaining library employment and those who unsuccessfully seek to obtain library employment. Estimates are not available for the latter category and so the table shows only those who do obtain library employment. This is in contrast with the estimate given for graduates, which includes all those seeking to enter the labor force.

TABLE 54--Librarian Supply and Demand

Years 1/	Total Employment 2/	Job Openings			New Supply			Excess of Supply Over Demand 7/
		Growth 3/	Replacement 4/	Total	Graduates 5/	Other Additions 6/	Total	
1978-1982	130,600	2,400	12,800	15,200	7,400	9,000	16,400	1,200
1982-1986	137,500	1,300	13,100	14,400	5,700	9,200	14,900	500
1986-1990	136,900	-100	13,700	13,600	5,800	9,600	15,400	1,800

1/ Table data reflect annual averages for the periods indicated. 1978-1982 data derived from NCES/OLLT Library Human Resources Survey, 1982. 1982-1986 and 1986-1990 projections developed by King Research, Inc.
2/ Total annual employment in public, academic, school and special libraries.
3/ Annual job openings due to increase (or decrease) in employment.
4/ Annual job openings due to death, retirement, occupational transfers, and others leaving the library labor force.
5/ Library program graduates seeking to enter the labor force each year (95 percent of all graduates). Includes graduates of accredited and nonaccredited MLS, BLS and school library certificate programs.
6/ Other entrants into the library labor force each year. Includes reentrants, delayed entrants, and occupational transfers.
7/ Projected number of individuals available annually for other positions, including non-library information professional positions.

The final table column, labelled "excess of supply over demand", is the difference between the totals for openings and new supply, thereby estimating the number of persons expected to require other employment. Other employment could include work in a field outside of librarianship, as a non-professional library worker, or as a non-library information professional.

In the 1978 through 1982 period, the average librarian employment was 130,600. About 15 percent of job openings were due to increases in the number of positions and about 85 percent to replacement demand, including deaths, retirements, and other departures. The total openings in libraries were the approximately 15,000 positions indicated here plus an estimated 8,000 positions created and filled by transfers between libraries. Based on these data, the total number of job openings per year would be about 23,000, or 18 percent of all jobs.

The average number of new graduates of library education programs over the 1978-1982 period was 7,400. This includes graduates of programs leading to the MLS and BLS degrees and programs preparing people for school library certification. About 70 percent of these graduates received Master's degrees from library education programs (60 percent from an ALA-accredited programs vs. 10 percent from nonaccredited Master's programs). About 5 percent of program completions obtained Bachelor's degrees from library education programs, and 25 percent did not obtain a library degree but completed a program leading to school library certification.

The other source of new supply, as described above, is other additions. This is estimated at 9,000 for 1978-1982. Thus the total new supply averaged 16,400. The excess of supply over demand in these terms, about 1,200 individuals, includes librarians who took library non-professional positions, non-library information professional positions, or positions outside of the information profession, or were unemployed (voluntarily or otherwise).

As seen in the table, the situation projected for the 1982-1986 period shows small decreases in the number of job openings and in the average number of graduates. The decrease in graduates is relative to the 1978-1982 average and occurs despite the expectation of increases in graduates in the late 1980's; this is because the decreases of the late 1970's were greater than the corresponding increases in the late 1980's. Date for 1978-1982 suggest a somewhat smaller excess of librarian supply over demand than in the previous period, about 500 individuals annually. This number is less than might be expected to go into non-library information professional positions, based on a 1981 movement of about 800 with projected increases through the 1980's. Thus, in this period, an improved job market is expected. It seems likely that there will be some increase in transfers into librarianship in the 1982-1986 period, with some of those having difficulty entering the field in the late 1970's now having a new opportunity, and other positions continuing to be filled.

As we have projected them, the number of library program graduates is related to salaries, which in turn are related to the library job market and other factors. Thus the number of graduates responds to employment levels and the average number of library program graduates is expected to increase in the late 1980's. Table 54 shows an anticipated number of 5,800 graduates seeking to enter the labor force over the 1986-1990 period. Combined with an estimated 9,600 other additions, this yields a new supply of 15,400. In the same period, library employment is expected to drop, and only 13,600 job openings are projected. The difference is 1,800 individuals available for other positions, again including non-library information professional positions. Thus, the outlook for the late 1980's appears to be of another period of excess librarian supply within the traditional library labor market.

What cannot be predicted quantitatively is the effect of movements by library schools towards the training of non-library information professionals. This is potentially a large market, conservatively estimated at one-third again the size of librarianship in 1980 and felt to be growing rapidly. While currently less than 4 percent of library graduates overall go into such positions, greater emphasis by individual schools has led to

more placements and opportunities appear to be available. These opportunities exist for the different types of library programs, all of which currently have about the same level of non-library information professional placement.

It is possible that in the near future the higher salaries earned by information professionals will attract more people into library/information science education programs and more graduates into non-library information professional postions. The supply model shows that potential library students are sensitive to salaries. It is generally believed that non-library information positions pay more than those in libraries, at least in part because the non-library positions are also competing for the well-paid graduates of business and computing programs. As more potential students learn more about non-library work, more may enroll in library programs to train for non-library work, and more of those who enroll intending to work in libraries may decide instead to seek non-library positions. This could increase library program completions substantially beyond what has been projected. It could conceivably also present libraries with serious competition for new graduates, resulting in a shortage of new librarians available to libraries.

Currently, relatively few new graduates are going into non-library information work. The trend out of libraries is more noticeable among those experienced librarians who, when changing jobs, leave libraries for other information positions. One explanation for this is that library education programs have not successfully marketed themselves to individuals interested in non-library work. Instead, they may be attracting almost exclusively people who want to work in libraries, some proportion of whom either change their career goals while in school or are forced into non-library employment upon graduation by the exigencies of the job market. Experienced librarians, on the other hand, having put some time in libraries, may be more willing to try a career change or may see more similarity between libraries and other settings than do new graduates.

Another area in which the projections in this report are tentative is transfers and reentrants. Without data over time on the effect of

changes in the market for librarians on reentrants and transfers, it is difficult to make projections. One would assume that individuals are more likely to reenter or transfer into a profession when job opportunities are plentiful. Given the relatively somber employment projections, it is possible that the reentry and transfer projections in Table 54 are high. On the other hand, it is impossible to estimate how many former librarians are in the population and would be willing and able to reenter the library labor force should the market improve. Some who have left the profession have done so permanently, never to return, but others have been forced out by the poor employment situation of the last few years, and would return if conditions improved. It is however, impossible to measure the size of this pool of potential reentrants.

We have chosen to view the key question in this study as the picture of librarian supply and demand. Librarians, however, are employed by different types of libraries and tend to remain within those types of libraries. In 1981, for example, only about 2 percent of all employed librarians transferred from one type of library to another. There is also segmentation of librarianship by the type of education obtained -- 91 percent of all library-employed individuals with school library certification and no library degree are in school libraries, as are 73 percent of library-employed BLS recipients and 66 percent of library employed graduates of nonaccredited MLS programs. MLS recipients make up 80 percent of all library-employed individuals from the three types of programs and 60 percent of the total librarian employment, including 90 percent of academic librarians, 73 percent of special librarians, 63 percent of public librarians, and 47 percent of school librarians. We can thus talk about the market for librarians being made up of different types of libraries -- public, academic, school, and special -- and of the supply as generated by the different types of programs.

Table 55 looks at components of projected supply and demand by library type. The main factor is the differences in anticipated employment within the four types, with public and special library employment expected to increase in the 1980's, academic library enrollment expected to increase and then decrease, and school library employment expected to decrease

TABLE 55--Librarian Supply and Demand by Type of Library: 1978-1980

Library Type and Years 1/	Total Employment 2/	Job Openings			New Supply			Excess of Supply Over Demand 7/
		Growth 3/	Replacement 4/	Total	Graduates 5/	Other Additions 6/	Total	
Public Library								
1978-1982	30,400	300	3,000	3,300	1,400	2,100	3,500	200
1982-1986	31,300	200	3,100	3,300	1,200	2,200	3,400	100
1986-1990	32,900	500	3,200	3,700	1,300	2,300	3,600	-100
Academic Library								
1978-1982	20,500	300	2,000	2,300	1,400	1,400	2,800	500
1982-1986	22,300	300	2,200	2,500	1,200	1,500	2,700	200
1986-1990	21,200	-400	2,200	1,800	1,300	1,500	2,800	1,000
School Library								
1978-1982	62,500	1,100	6,100	7,200	3,400	4,300	7,700	500
1982-1986	64,200	200	6,400	6,600	2,400	4,500	6,900	300
1986-1990	61,000	-700	6,200	5,500	2,200	4,300	6,500	1,000
Special Library								
1978-1982	17,300	700	1,700	2,400	1,200	1,200	2,400	---
1982-1986	19,600	600	1,900	2,500	900	1,300	2,200	-300
1986-1990	21,800	500	2,100	2,600	1,000	1,500	2,500	-100

1/ Table data reflect annual averages for the periods indicated. 1978-1982 data derived from NCES/OLLT Library Human Resources Survey, 1982. 1982-1986 and 1986-1990 projections developed by King Research, Inc.
2/ Total annual employment in public, academic, school and special libraries.
3/ Annual job openings due to increase (or decrease) in employment.
4/ Annual job openings due to death, retirement, occupational transfers, and others leaving the library labor force.
5/ Library program graduates seeking to enter the labor force each year (95 percent of all graduates). Includes graduates of accredited and nonaccredited MLS, BLS and school library certificate programs. Assumes a constant proportion of graduates of each program type seeking positions in each type of library.
6/ Other entrants into the library labor force each year. Includes reentrants, delayed entrants, and occupational transfers.
7/ Projected number of individuals available annually for other positions, including non-library information professional positions.

generally (see Table 6). From the projected data on employment, the average job openings due to growth (or job reductions due to fewer positions) were calculated and are shown in the second column of the table. Column 3 shows replacement demand based on the anticipated number of individuals leaving library employment, and the fourth column gives the combined number of job openings. The supply of new graduates is based on the projected graduates from each program type, assuming that within program types the proportion of graduates going to each type of library will remain about the same as it is currently. Other additions are calculated in the same manner as before and shown in column 6, and the new supply is totaled in column 7.

Comparing new demand expressed as job openings with the supply of new librarians, we find some excess of supply over demand in academic and school libraries throughout the 1978-1990 period. There is also a small excess of supply over demand in public libraries through 1986. In special libraries, demand is projected to exceed supply. In the 1986-1990 period, the demand for new academic and school librarians will drop dramatically, with the opportunities being in public and special libraries (and very possibly in information professional positions).

This provides a partial answer to the question "Where will the jobs be for new librarians in the late 1980's?" According to our projections, the jobs will be in school, public, special and academic libraries, in that order. Due to levels of supply, jobs will be more readily available in public and especially special libraries. With the projected excess of supply over demand, jobs for librarians will also need to be found outside of libraries, such as in non-library information professional settings.

Another possible difference among types of libraries, which is not revealed by this study, is in replacement demand. The rate at which people leave the labor force depends in part on their age and sex. Historically women have had shorter working lives than men, although the gap has been narrowing rapidly over the last decade or so and educated women's labor force participation patterns are now much like men's. The various types of libraries differ strikingly in their sex composition, ranging from academic

libraries which are 65 percent female to school libraries at 91 percent. No data were collected on ages of librarians. Differences in labor force departures across types of libraries -- due to differences in their sex composition or, more likely, in average age -- would affect the replacement demand within each type of library.

Jobs will also become available in the late 1980's as librarians transfer positions, but transfers within librarianship can be expected to decrease as the market tightens. The possibility of transfers to other fields depends, of course, on the situation within those fields. One traditional market for school librarians is teaching, where projections are for good opportunities in elementary schools but not in secondary schools [238]. The outlook for academic librarians transferring within their own instititions is not optimistic, since college and university staffs are expected to decline overall.

As the number of employed librarians remains steady or decreases in the 1980's, and the majority of new jobs are associated with replacement needs, the pattern of job openings will be different from that which occurs in periods of expansion. There are likely to be fewer entry level openings. If, at the same time, new graduates make up a larger portion of the new supply pool, there is likely to be more competition for these entry level positions.

One factor not incorporated in our model but of potential impact is the number of part time positions. In our model, we assumed a constant level of part time positions. Part time positions are more common, however, in public and special libraries. As the proportion of public and special libraries increases, then, so may the number of individuals working part time. This would have the effect of reducing the number of full time equivalency positions needed to employ the available supply. The same situation might also appear in academic and school libraries as the number of positions decrease; that is, there could be more part time employment. Some of this part time employment would have to be considered underemployment, but there has been some increased interest generally in wider availability of part time and shared positions.

Another area which this study touched on but did not explore in detail was the relationship between professional and nonprofessional library employment. Many believe that libraries have been shifting their employment mix away from librarians toward less-costly nonprofessionals, but the Employer Survey data indicated little change in the relative numbers of librarians and nonprofessionals employed over the five years of the survey. Another hypothesis was that libraries are increasingly promoting nonprofessionals into professional positions (without benefit of additional formal training), as a result of challenges to the MLS as a legitimate job requirement that have been brought in many libraries. The Employer Survey indicated that 6 percent of newly-hired librarians had been promoted from nonprofessional positions in the same library. Given that many MLS graduates have taken nonprofessional jobs in the last few years, some of these no doubt were people with MLS degrees promoted into jobs commensurate with their training. There are, however, at least some people making the transition from nonprofessional to professional.

Another hypothesis that was not supported was that the profession is becoming less female. Given the movement of women into traditionally male professions in recent years, and the general trend toward decreased sex-typing, one might expect to see similar changes in traditionally female professions like librarianship. The relative proportions of men and women in the profession, however, are substantially the same in the Employer Survey, the Library School Survey, and the 1970 Census, indicating no change. The marked difference in sex distribution across type of library, ranging from 65 percent female in academic libraries to 91 percent in school libraries, merits further research.

Not taken into account in the previous discussions is the future employment situation by geographic area. This is difficult to address; there are data on graduates and positions by region (see Tables 8 and 22) but none on mobility patterns among libraries 1/ . If it is assumed that

1/ There are no data on historical patterns of librarian job mobility. However, for a very good discussion of the mobility of librarians in relation to "upward job mobility," the reader is referred to [28] in the bibliography.

graduates generally stay within the region in which they attend school, the Library Human Resources Survey results for the 1977-1981 period suggest small excesses of supply over demand in the North Atlantic, Great Lakes and Southeast regions and an excess of demand over supply in the West and Southwest regions. In addition to regional trends, there would also appear to be local differences in the supply and demand picture, with positions more available in rural areas. As the mix of types of libraries changes in the 1980's, with proportionately fewer academic and school librarians, the geographic distribution of jobs should change as well, suggesting that the mobility of individuals may play a factor both now and in the future in finding professional library employment. In precisely what way this will happen is unknown, but it seems reasonable that there could continue to be shortages in rural public libraries.

Our study also did not look in depth at distinctions between different areas within librarianship, such as administration, reference, cataloging, technical processing and so on. Again, no comprehensive data are available on the current mix of positions in libraries. In the reference area, though, the market for the academic subject specialist is likely to decline, while more positions become available in special libraries in business, industry, law, medicine and so on. Generally, the average library size (in terms of number of librarians) will probably decrease in the late 1980's, requiring a reevaluation of the mix of tasks to be performed by professional staff. While the need for technical processing activity is not likely to decline as the volume of information available increases, automation and networking activities may reduce the number of professional librarians needed in this area. As with the total U.S. job market for the 1980's, individuals with computer-related skills can be expected to be in demand [238].

Perhaps more important than the quantitative projections developed in this study are the findings of the models that supply and demand for librarians can be predicted from other events, identifying "leading indicators," in effect, to be watched. Supply is a function of librarian salaries and total master's degrees awarded. Librarian salaries are, in turn, dependent on expenditures on libraries, professional women's

salaries, and past numbers of library program graduates. This means that an exogenous change in any of these variables will presage a change in librarian supply. For example, if the crisis in government spending at all levels depresses librarian salaries, the profession can expect a continued decline in supply.

The demand indicators include population and school enrollment at various levels. Population changes fairly slowly, meaning that library employment will also remain fairly stable. Over the longer term, changes in the birth rate during the last decade or so have made it difficult for the Census Bureau to project population, but the lagged nature of the relationship between births and library employment gives libraries time to adapt to changes. The most volatile of the demand indicators is probably college enrollment, which could change markedly as a result of social and economic factors that might make a college education less attractive or less accessible, as well as a result of changes in the size of the college-age population.

The demand indicator identified for special libraries was research and development funding. It is also safe to assume that since most libraries are in business and industry their fortunes will reflect those of their parent industries. Growing industries will mean growing special library employment, with more information-oriented industries (such as electronics and bio-engineering) creating more jobs than others.

The implications of this study for currently employed and prospective librarians seem clear. Little change is expected in employment overall with decreases in school and academic library positions. There will be strong competition for jobs in the late 1980's. While the study does not address the specific functional areas in which opportunities will be best, subject expertise in business and industrial related areas and computer-related skills are likely to be helpful. With job shortages, geographic mobility will also be desirable. For individuals considering librarianship as a profession, opportunities to carry out similar functions in a non-library environment should also be investigated.

The study also has implications for library educators: MLS program enrollments are projected to increase, but slowly, during the 1980's and enrollments in BLS and school library certificate programs are expected to decrease throughout the 1980's. Responses are needed to new patterns of demand for librarians and to changes in the types of skills required of librarians. There appears to be potential for programs currently offering any level of library training to also take on the training of information professionals for non-library settings.

For employers of librarians, this study implies that, on the average, they will not be hiring many librarians. Such job openings as they have will result from retirements and from current employees changing jobs, not from expansion. Although supply will be below its past levels, it will still exceed demand, resulting in a buyer's market. The low level of turnover, however, suggests that libraries will have to place an increasing emphasis on staff development. Unable to create new positions, and with fewer people leaving voluntarily (as the poor market discourages them from seeking greener pastures), libraries will have to rely more on retraining and less on hiring to bring in new skills in changing areas such as automation of library processes and of information storage and retrieval. Library educators may therefore want to switch some of their efforts from the training of new librarians to continuing education.

The surveys conducted as a part of this study established the feasibility of collecting much of the data relevant to research on librarian employment, especially data on transfers. They also established baseline data on employment by all types of libraries and on graduates from all library education programs. The models developed provide a means of taking these data and evaluating the supply and demand situation. This is a function which should be performed periodically for the library profession overall, and would also be of interest within specific geographic areas and other subdivisions of the field. Finally, the results obtained from this study provide challenges to library researchers to explore aspects of the employment picture in greater depth, addressing such areas as changes in functional requirements in libraries, librarian mobility patterns, job transfers by librarians, and monitoring of job openings.

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APPENDIX A

SURVEY METHODOLOGY

The Library School and Employer Surveys were conducted to provide primary data for input into the models of librarian supply and demand projected through 1990. The two surveys are necessarily complementary: the former covers graduates as a component of new supply and the latter addresses employment, or demand, in the various types of libraries. To ensure that the data from the two surveys were consistent, they were undertaken in parallel.

A.1. Sample Development

The first procedure in the surveys' design was the development of their respective samples, which occurred betwen August 1981 and January 1982. In order to get a true picture of librarian employment and demand in all kinds of libraries, the universe of library employers was viewed as containing nine types of libraries (Table A.1). Sampling was based on library type, with the National Center for Education Statistics providing the sample designs for types 1-6 and 8. The sources for selection of these samples were as follows:

- Public libraries -- NCES, LIBGIS III, Public library universe, 1977.
- Public school district libraries/media centers — NCES, Public school systems (LEA'S) universe, 1979/80.
- Private school libraries — NCES, unpublished non-public elementary and secondary school survey for 1976/77 through 1978/79.
- College and university libraries — NCES, LIBGIS/HEGIS XIV, College and university libraries, fall 1979 survey.

TABLE A.1--Employer Sample: Library Types

Number	Library Type
1	Public
2	Public school district
3	Private school
4	College and university
5	Federal
6	Special serving state governments
7	Independent research
8	"Other" special
9	State library agency

Note: Results from types 5-9 were aggregated to produce "special library" results.

- Federal libraries — NCES, survey of Federal libraries, fiscal year 1978.

- Special libraries serving state governments — NCES, LIBGIS II, survey of special libraries serving state governments, fiscal year 1977. 1/

- Other special libraries — 1980 American Library Directory, 33rd edition [11].

Public schools were sampled at the school district level, rather than the individual school building level. Districts with fewer than 300 students enrolled were excluded. The best lists available for public school districts and private schools covered facilities both with and without libraries. Public libraries and private school libraries of all sizes were surveyed: there were no exclusions from their respective universes on the basis of small size of population served or small number of students enrolled.

Independent research libraries and state library agencies were small groups and were included in the sample in their entirety. The sources for the remaining two universes were: a current listing of the members of the Independent Research Libraries Association and the listing of state library agencies found in the 1981 Bowker Annual, pp. 515-518 [12]. Within each other employer type, all large libraries were included with certainty. The universe of librarian employers was then further broken down within types 1-6 and 8; other library characteristics as shown in Table A.2 were used to stratify these samples.

1/ File names that correspond to the sources listed for Employer types 1-6 are:

NCES.XEENBF.LIB.UNIVERSE.A1977.MASTER;
NCES.XEESBF.ELSEG.SDU.A79-80;
NCES.XEENBM.ELSEG.NPSU.IMPUTE.A76-78;
NCES.XEENBM.EDI.HEG.LIB14.A78-79.U.E.;
EDI.FEDLIB.A7978;
EDI.LIB.SPECIAL.STATES.A1977.

TABLE A 2.--Stratification Variables for Library Types (Maximum of 3 variables per type)

Library Type		Variables
(1)	Public	Region, Standard Metropolitan Statistical Area, population served
(2)	Public school district	Enrollment, region
(3)	Private school	Religious affiliation, type (elementary or secondary), enrollment
(4)	College and university	Control (private or public), type (university, 4 yr. or 2 yr.), staff size
(5)	Federal	Size (number of professional staff) by region: 2 digits together indicate a single stratum
(6)	Special serving state governments	Size (number of professional staff members)
(7)	Independent research	Not stratified
(8)	Other special	Number of professional staff members
(9)	State library agencies	Not stratified

The universe of library schools/programs was determined from a variety of published lists. In order to avoid cross-classification of schools offering more than one program and so that each program could be traced back to its source list, library schools were broken down into the following types:

1 - ALA-accredited Master's programs
2 - Nonaccredited Master's programs, AALS associates
3 - Nonaccredited Master's programs, not AALS associates
4 - Undergraduate programs
5 - Degree/program unknown
6 - School library certification programs

Names of library education programs were culled from the sources below (numbers correspond to library school types):

1 - ALA October 1981 list of accredited programs, updated before mailout from March 1982 list.

2 - Directory of the Association of American Library Schools, 1980, updated to 1981.

3 - American Library Directory (1980) list of nonaccredited programs (cross-checked against source #2 to remove AALS associate members).

4 - American Library Association, Standing Committee on Library Education, November 1980 list: Undergraduate Programs in Library Education (four-year schools), supplemented by all other undergraduate program listings in the 1980 American Library Directory.

5 - Programs present in a packet of materials from the School Library Manpower Project that were not found on any other lists. (Note: this list was used to supplement the other listings and many members on this list were found not to offer library education programs).

6 - Peterson's Annual Guide to Undergraduate Study, 1980 edition, and correspondence with State Education Agencies, 1982.

Once both sets of samples were designed and stratified where appropriate, each prospective respondent was then assigned an

identification number consisting of one digit for survey type, a three digit sequential number, and three digits for strata. Next a two digit state code (using the Office of Education state codes list) was added in order to facilitate geographic analysis of the results. The sample listings, modified in this fashion, were then used as copy from which we typed mailing labels and created logs.

A.2. Questionnaire Development

Development of the survey instruments began early in the project and continued throughout the period during which the samples were designed. In 1981, the project staff developed drafts of the questionnaires for the pretest and then sent these forms to Department of Education project officials and the project advisory board. After completion of the necessary modifications, the forms were submitted for FEDAC/OMB approval, which was received in September of 1981. Pretesting commenced with site visits in late September and continued through October with a total of eighteen conducted. A mail pretest of 81 employers and 22 library schools began in late October with followup in November. Pretest response statistics are given in Table A.3.

Once followup efforts had been completed, the pretest questionnaires were then examined to determine the range of numeric responses and to identify questions that had given respondents difficulty. This analysis initiated certain changes in the questionnaires. Full time work was redefined as that considered full time in the particular library; this was done to cover employees in libraries that consistently used less than a 35 hour work week (school libraries, etc.). Due to the fact that some library schools kept records on a calendar year rather than on an academic year basis, it was decided that both forms of data were acceptable in the Library School Survey. Questions on the educational attainment of librarians in the Employer Survey were also broadened, taking into account non-library degrees, etc. Due to respondent difficulty in providing data about school library certificate program completions, state Boards of Education were contacted in the hopes of supplementing survey data. This provided a few additional names of schools to survey, but no state-level data.

TABLE A.3.— Pretest Response Statistics

EMPLOYER SURVEY

Library Type	Adjusted Sample	Usable Response
1	18(2)	15(2)
2	19(2)	12(2)
3	12(2)	7(2)
4	18(3)	17(3)
5	10(1)	8(1)
6	3(0)	3(0)
7	1(0)	0
8	12(2)	10(2)
9	0	0

LIBRARY SCHOOL SURVEY

Program Type	Adjusted Sample	Usable Responses
1	9(3)	9(3)
2	2(1)	2(1)
3	7(2)	5(2)
4	7(0)	5(0)
5	0	3(0)
6	3(0)	3(0)

Note: Site visit statistics are indicated in ( ).

At this point, full scale survey forms were designed incorporating the aforementioned changes and one additional alteration: the "base year" of the Employer Survey was converted from 1981 to 1982, and the time coverage of all other questions was shifted forward one year so that the final data would be as current as possible. Finally, a second review process was completed and the full-scale forms were submitted for clearance in February of 1982. The final survey instruments are included at the end of this appendix as Exhibits A.1 and A.2.

A.3. Full-scale Survey Data Collection

OMB cleared the full-scale instruments in early May. Mailouts of the Employer questionnaires began nearly immediately and were made in successive waves, and the Library School questionnaires followed closely behind in early June. Initial mailouts to 2,332 employers and 382 library education programs were completed by July. Before the end of the initial mailouts, mail and subsequently phone followups were set in motion. A second questionnaire with a new cover letter sent regular mail was used as the first (mail) followup procedure. After approximately two weeks, remaining nonrespondents were called. Those who agreed to respond over the phone then received another questionnaire if they so requested. A few weeks later, respondents who stated they would comply during the first phone followup but who had not yet replied were called once again. Followups continued until the end of September when acceptable levels of response were attained for each employer/program type. (The greatest difficulties were with private school libraries; due to poor response rates, an alternate sample was chosen and surveyed in early September. The low response rate here appears attributable to timing: private schools were closed with no administrative staff present during the summer and most likely quite concerned with start of school year matters through early September). Final response rates were calculated after the physical presence and response category of each questionnaire were verified, with universe estimates adjusted as necessary to account for closings, etc. The response rate tally, which aggregates the pretest and full-scale statistics, is shown in Table A.4.

TABLE A.4.— Survey Universe

	Estimated Universe Size	Sample Size	Respondents	Response Rate
Employer Survey				
Public libraries	8,144	501	373	74%
Public school libraries	11,694	415	298	72
Private school libraries	13,561	363	199	55
College and university libraries	2,976	511	406	79
Federal libraries	825	190	160	84
Special libraries serving State governments	754	46	42	93
Independent research libraries	15	15	11	73
Other special libraries	5,624	243	193	79
State library agencies	51	51	41	80
TOTAL	43,644	2,335	1,723	74
Library School Survey				
Accredited MLS programs	63	63	55	87
AALS-assoc. nonaccredited MLS programs	30	30	17	57
Non-AALS-associated nonaccredited MLS programs	66	66	32	48
Undergraduate programs	91	91	55	60
Programs with unknown degree/ certification	15	15	7	47
School library certificate programs	10	10	9	90
TOTAL	275	275	175	64

A.4 Pre-coding Procedures

During the period between the pretest survey and close of the full-scale survey, test manual edit procedures were drafted and tested on the pretest questionnaires. These were then modified for the post-clearance full-scale questionnaires. As the full scale responses came in, project staff examined them for recurring kinds of non-numeric responses and for errors, as well as for the range of numeric responses. This investigation of full-scale data, along with the previously determined ranges of pretest responses and identification/strata number ranges, provided information for checks for allowable numeric data for all parts of each of the two surveys. Extensive intra-questionnaire consistency checks (e.g. men plus women librarians equal total librarians; if no BLS program offered, no BLS graduates reported) were developed for each survey type and included in manual edit procedures.

Once data processing staff reviewed the preliminary editing procedures, record layouts were devised. The final record layouts and preliminary edit procedures were then used to formulate a codebook for each survey type.

A.5 Coding and Editing

Training for coders occurred early in August, while survey staff were still heavily involved in followup efforts. Coders were instructed to watch out for numeric and logic errors and to call the respondent whenever necessary for clarification. An estimated 200 completed calls were made to clarify responses. At the same time, data processing personnel converted manual edit procedures (both logic and numeric range) into computer program format. Coding operations ended early in October with a final count of qualified responses against receipt control forms.

A.6 Keypunching

In late September, KRI sent 50 questionnaires (25 of each survey type) to NCES' keypunching facility and to our data processing contractor to test accuracy and turnaround time. COMNET, NCES' facility, proved adequate and keypunched the questionnaires in batches corresponding to employer/library program types between October and early November 1982.

A.7 Computer Editing

After a test run of the edit programs on a small segment of survey data showed that these programs worked properly, master tapes of data from each type of survey instrument were created. Once master tapes that could be read by our data processing facility had been made, edit runs to identify range and logic errors as well as missing data began. Correction of the keypunched data took an entire month, for several reasons: the sheer bulk of the Employer Survey data, frequent errors in the identification/strata number portion of cases, and the need to verify all values given as sums against the addition of their components. Editing of numeric responses to the Library School Survey was finished by late November; the Employer data required more time and was completely clean by mid-December.

A.8 Weighting

Weights for the Employer Survey were developed by NCES based on the following data for each survey stratum:

original universe size
mailout
qualified mailout
responses

In most cases, the counts of the survey mailout and the qualified mailout were the same. A number of private schools, however, reported that they had no library or media center. This information was used to develop estimates of the universe of private schools with libraries or media centers. A few additional adjustments were made to the universe size based on libraries that had closed, could not be located, or were otherwise unqualified.

The term "responses" refers to questionnaires of qualified respondents containing some or all of the requested data. Refusals were counted as nonrespondents. Weights were computed for each stratum by dividing the revised universe size by the number of responses. This weight thus combines calculations to project from the number of respondents to the mailout size and from the number mailed out to the universe of employers.

In a few cases, adjacent small strata were collapsed and a combined weight developed. In all, weights were computed for 183 strata. To give an indication of the magnitude of the weights used, Table A.5 gives the range of weights for each library type.

The above process was followed generally, with the exception being certainty strata with nonrespondents. In these instances, peer libraries with similar characteristics were selected from among respondents and given a weight of 2.0. Other respondents in the certainty strata received a weight of one. In one case, where there was only one library in a certainty strata and it did not respond, the peer library was selected from another stratum and that library's data were used for the nonrespondent.

TABLE A.5--Range of Weights Used for the Employer Survey

Library Type	Number of Strata*	Universe Size	Response Size	Range of Weights
Public (1)	60	8,144	373	1.0-376.0
Public school district (2)	56	11,694	298	1.0-260.0
Private school (3)	21	13,561	199	3.875-411.0
College and university (4)	22	2,976	406	1.0-42.6667
Federal (5)	8	825	160	1.0-19.23
Special serving state governments (6)	5	754	42	2.0-22.88
Independent research (7)	1	15	11	1.0-2.0
"Other" special (8)	9	5,624	193	1.0-107.0526
State library agency (9)	1	51	41	1.0- 2.0
TOTAL	183	43,644	1,723	

* After similar small strata were collapsed.

Weights for the Library School Survey were calculated based on the list from which the schools were sampled. The weights for the six strata were as follows:

ALA-accredited	(1)	1.1455
AALS associate (nonaccredited)	(2)	1.7647
Other graduate	(3)	2.0625
Undergraduate	(4)	1.6545
Unknown	(5)	2.1429
Certification	(6)	1.1111

The weights as developed for each strata were applied to the clean survey data after editing, and checks were performed to make certain that the weighted estimates of the universe were correct. A file was created which contained the weighted data results.

A.9 Imputation

Imputation procedures were developed to deal with item nonresponse. In order to carry out the imputations, those items requiring imputation were identified, set procedures were applied, and an imputed value was inserted in the survey file. Imputed values are distinguished from original values in the file by flag variables which are set to 1 when an imputation is present.

To develop imputation procedures, the overall level of nonresponse and the nonreponse patterns, that is, what combinations of questions tended to have all answers given or none at all, were looked at. On the Employer Survey, question nonresponse ranged from none to about six percent with only Part IID of the questionnaire (referring to positions in previous years) over 3 percent nonresponse. On the Library School Survey, item nonresponse ranged from none to over 50 percent for some school library certification data. Generally, school library certification data were

the most incomplete. For the other types of program item nonresponse was about 10 percent for admissions data, 2 percent for completions data, and 25 percent for placement data.

Imputation procedures were based on logical relationships within the questionnaire and on data for respondents to a particular question in the same stratum as the nonrespondent. For example, if an employer identified the total number of current employees (Question 26C) but did not break that down by sex, an imputation was made based on the total given and the percentage breakdown of males and females for other employers in the same stratum. Detailed rules were developed for imputation of all questions requiring them, with alternate procedures specified depending on what other items were missing or not missing on the particular questionnaire.

Because of the complexity of the imputation rules, imputations were carried out by hand. Computer runs were first made to identify those items requiring imputation and the relevant within-strata means needed to compute them. After the imputations were done the values were added to the survey file and the imputation flags were set.

A.10 Analysis

The weighted, imputed survey data were used to conduct a basic analysis of survey data. Tabulations were made for all questions for each type of employer and each type of library school program, and some additional tabulations were done based on specifications developed as a part of the final survey clearance package. The output from these analyses is presented primarily in Chapter 2 of this report.

Survey data were also input to the various models of supply and demand developed for this study. These uses of the survey data are identified in this report as the modelling efforts are described.

A.11 Sources of Error from the Survey

There are two general sources of error in making estimates from sample surveys. The first of these, sampling error, occurs because estimates are based on a sample rather than observations taken from the entire population. The second source is called nonsampling error and is attributable to a number of sources such as the inability to obtain information about all libraries or places of employment in the sample, improper sample design (or assignments of weights), impreciseness of definitions, different interpretations of questions, inability (or unwillingness) of respondents to provide accurate data, mistakes in processing the data, and so on.

The extent of sampling errors can be measured by standard errors. If a sample of a given size was chosen over and over again, there would be many different estimates found from the samples. The difference between a particular sample estimate and the average of all possible samples is called the sampling deviation. A standard error of an estimate (e.g., mean, proportion or total) made from a particular sample is a measure of the deviation or variation among estimates (e.g., of all means) from all possible samples (of a given sample size). It is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. The precision is greater if the inherent variability of observations from the population is less or if the sample size is greater. In fact, an estimate will have perfect precision if the entire population is sampled (i.e., a census). The reason for this is that the estimates of all possible samples of the entire population would be the same so that there is no variability.

The standard error also partially measures the effect of certain nonsampling errors. Any systematic biases in the data are not so measured. Bias is the difference, averaged over all possible samples, between the estimate and the desired value being estimated. Because of bias, a sample

of the entire population would yield an estimate that is not the true population value of the estimate. Bias is difficult to detect or measure. The total error can be thought of as the hypotenuse of a right triangle where the two sides are the precision and bias. Sampling errors, nonsampling errors and efficiency of the sample design as they apply to the survey leading to this report are discussed below.

Sampling Errors

As mentioned above, the extent of sampling errors can be measured by standard errors. This part of the section on sources of error from the survey discusses how standard errors can be employed to compute confidence intervals, gives estimates of standard errors for some principal estimates, and describes how the standard errors were computed. Standard errors are often presented as absolute numbers or as relative standard errors (coefficients of variation) where the standard error is divided by the estimate it is applied to (i.e., mean, total, proportion, etc.). In this report both absolute and relative standard errors are presented. The absolute standard errors can be described in terms of confidence intervals. If a standard error is added to and subtracted from the estimate it is applied to, the result is a confidence interval at about 0.66 level of confidence. This means that, if the sample (at a given size) is repeated over and over again, about two-thirds of the estimated confidence intervals would contain the average value of all possible samples. Thus a particular sample has a one-third chance of not containing the average value of interest. If one wants to be more certain that the estimated confidence intervals contain the average value of interest, one can compute a 0.90 level of confidence by multiplying the standard error by 1.64 and a 0.95 level of confidence by multiplying the standard error by 1.96. New confidence intervals can be computed at the 0.90 and 0.95 levels, meaning that 90 percent and 95 percent of the estimated confidence intervals of repeated samples would contain the average value of all possible samples. A confidence interval computed with three standard errors (as opposed to 1, 1.64 and 1.96 standard errors) would have almost all intervals contain the average value of all possible samples.

It is noted that the Library School Survey was a census (i.e., all institutions were included in the survey) and thus the principal error is attributed to imputation and not sampling. Tables A.6-A.9 cover the Employer Survey and give several principle estimates, the absolute and relative standard errors of the estimates, the sample size used in the computation of the standard errors and the number of observations for which imputations were made due to missing items. (The latter data will be discussed in detail in the next part of this section).

It is noted that the relative standard errors of the number of librarians employed tend to increase as the data become older. For example, with the total number of librarians employed by public libraries the relative standard error is 0.06 in 1982 and about 0.10 in 1978. The absolute and relative standard errors for all employment, new hires and departures appear to be quite reasonable.

In order to be able to know what the sampling errors are for other data in the report, approximate estimates are provided for relative standard errors and absolute standard errors for various levels of the number of persons estimated to be in the population for each of the four employer strata. These estimates (which are also subject to sampling error) were derived by plotting the estimated numbers of persons against relative standard errors (observed in Tables A.6 through A.9) on log-log paper. A straight line was then drawn through the points to provide approximate values of relative standard errors at intermediate points. Note that these tables apply only to recent data and not to estimates of previous years or projected years. The results are given in Tables A.10 through A.13.

TABLE A.6—Estimated Values, Absolute Standard Errors, Relative Standard Errors, Sample Size and No. of Imputations for Employment (1978-82), Women Employed (1982), MLS Graduates Hired (1981), Nonlibrary Information Professionals Hired (1981), Total Librarians Hired (1981), Information Professionals Leaving Library Employer (1981) and Total Librarians Leaving (1981) by Public Libraries

Characteristic	Estimated Value of Characteristic	Absolute Standard Errors	Relative Standard Errors	Sample Size	No. of Imputations
Total No. of Librarians Employed (1978)	30,100	2,970	0.10	367	84
Total No. of Librarians Employed (1979)	29,900	2,129	0.07	369	21
Total No. of Librarians Employed (1980)	30,400	2,211	0.07	372	19
Total No. of Librarians Employed (1981)	30,700	2,041	0.07	371	28
Total No. of Librarians Employed (1982)	31,100	2,039	0.06	372	0
Total No. of Women Employed (1982)	29,040	1,488	0.05	372	3
MLS Graduates Hired (1981)	830	77	0.09	370	7
Nonlibrary Information Professionals Hired (1981)	100	22	0.21	370	7
Total Librarians Hired (1981)	5,230	698	0.13	370	7
Information Professionals Leaving Library Employer (1981)	260	107	0.41	372	9
Total Librarians Leaving (1981)	4,550	307	0.07	372	9

TABLE A.7—Estimated Values, Absolute Standard Errors, Relative Standard Errors, Sample Size and No. of Imputations for Employment (1978-82), Women Employed (1982), MLS Graduates Hired (1981), Nonlibrary Information Professionals Hired (1981), Total Librarians Hired (1981), Information Professionals Leaving Library Employer (1981) and Total Librarians Leaving (1981) by Public Libraries

Characteristic	Estimated Value of Characteristic	Absolute Standard Errors	Relative Standard Errors	Sample Size	No. of Imputations
Total No. of Librarians Employed (1978)	19,900	793	0.04	403	12
Total No. of Librarians Employed (1979)	20,360	668	0.03	404	10
Total No. of Librarians Employed (1980)	20,410	719	0.03	404	7
Total No. of Librarians Employed (1981)	20,410	692	0.03	404	8
Total No. of Librarians Employed (1982)	21,220	659	0.03	405	0
Total No. of Women Employed (1982)	13,770	514	0.04	405	5
MLS Graduates Hired (1981)	460	49	0.10	403	0
Nonlibrary Information Professionals Hired (1981)	140	25	0.18	403	0
Total Librarians Hired (1981)	2,310	88	0.04	403	0
Information Professionals Leaving Library Employer (1981)	180	24	0.13	405	7
Total Librarians Leaving (1981)	2,160	126	0.06	405	7

TABLE A.8—Estimated Values, Absolute Standard Errors, Relative Standard Errors, Sample Size and No. of Imputations for Employment (1978-82), Women Employed (1982), MLS Graduates Hired (1981), Nonlibrary Information Professionals Hired (1981), Total Librarians Hired (1981), Information Professionals Leaving Library Employer (1981) and Total Librarians Leaving (1981) by Public Libraries

Characteristic	Estimated Value of Characteristic	Absolute Standard Errors	Relative Standard Errors	Sample Size	No. of Imputations
Total No. of Librarians Employed (1978)	60,820	1,841	0.03	496	10
Total No. of Librarians Employed (1979)	62,750	1,755	0.03	497	10
Total No. of Librarians Employed (1980)	62,420	1,763	0.03	497	10
Total No. of Librarians Employed (1981)	61,210	1,842	0.03	496	27
Total No. of Librarians Employed (1982)	65,200	2,198	0.03	497	0
Total No. of Women Employed (1982)	61,080	1,465	0.02	497	7
MLS Graduates Hired (1981)	1,510	556	0.37	493	23
Nonlibrary Information Professionals Hired (1981)	480	290	0.61	493	24
Total Librarians Hired (1981)	11,130	902	0.08	493	24
Information Professionals Leaving Library Employer (1981)	710	351	0.49	496	25
Total Librarians Leaving (1981)	7,860	1,005	0.13	496	25

TABLE A.9--Estimated Values, Absolute Standard Errors, Relative Standard Errors, Sample Size and No. of Imputations for Employment (1978-82), Women Employed (1982), MLS Graduates Hired (1981), Nonlibrary Information Professionals Hired (1981), Total Librarians Hired (1981), Information Professionals Leaving Library Employer (1981) and Total Librarians Leaving (1981) by Public Libraries

Characteristic	Estimated Value of Characteristic	Absolute Standard Errors	Relative Standard Errors	Sample Size	No. of Imputations
Total No. of Librarians Employed (1978)	15,640	971.0	0.06	447	20
Total No. of Librarians Employed (1979)	17,040	1,361.0	0.08	447	16
Total No. of Librarians Employed (1980)	17,480	1,333.1	0.07	447	14
Total No. of Librarians Employed (1981)	17,660	1,403.1	0.08	447	29
Total No. of Librarians Employed (1982)	18,600	1,513	0.08	447	0
Total No. of Women Employed (1982)	14,620	1,268	0.08	447	6
MLS Graduates Hired (1981)	940	333	0.35	445	6
Nonlibrary Information Professionals Hired (1981)	220	119	0.54	445	6
Total Librarians Hired (1981)	4,340	182	0.04	445	6
Information Professionals Leaving Library Employer (1981)	320	218	0.68	447	7
Total Librarians Leaving (1981)	2,680	553	0.21	447	7

TABLE A.10 --Approximate Relative Standard Errors and Absolute Standard Errors at Various Levels of Number of Persons in Population for Public Libraries (n=370-372): 1982

Number of Persons in Population	Relative Standard Errors	Absolute Standard Errors
100	30.0%	± 30
250	24.0%	± 60
500	19.0%	± 95
750	17.0%	± 125
1,000	16.0%	± 160
2,500	12.0%	± 300
5,000	9.6%	± 980
7,500	8.6%	± 650
10,000	7.9%	± 790
25,000	6.2%	± 1,550
50,000	5.0%	± 2,500

TABLE A.11—Approximate Relative Standard Errors and Absolute Standard Errors at Various Levels of Number of Persons in Population for Academic Libraries (n=403-405): 1982

Number of Persons in Population	Relative Standard Errors	Absolute Standard Errors
100	16.0%	± 16
250	12.0%	± 30
500	9.8%	± 50
750	8.6%	± 65
1,000	7.9%	± 80
2,500	5.9%	± 145
5,000	4.8%	± 240
7,500	4.2%	± 315
10,000	3.8%	± 380
25,000	2.9%	± 725
50,000	2.4%	± 1,200

TABLE A.12—Approximate Relative Standard Errors and Absolute Standard Errors at Various Levels of Number of Persons in Population for School Libraries (n=493-497): 1982

Number of Persons in Population	Relative Standard Errors	Absolute Standard Errors
250	95.0%	± 30
750	51.0%	± 65
1,000	39.0%	± 80
2,500	17.0%	± 145
5,000	14.0%	± 240
7,500	12.0%	± 315
10,000	9.4%	± 380
25,000	5.3%	± 725
50,000	3.4%	± 1,200
75,000	2.7%	± 2,000

TABLE A.13—Approximate Relative Standard Errors and Absolute Standard Errors at Various Levels of Number of Persons in Population for Special Libraries (n=445-447): 1982

Number of Persons in Population	Relative Standard Errors	Absolute Standard Errors
100	93.0%	± 95
250	61.0%	± 155
500	44.0%	± 220
750	36.0%	± 270
1,000	31.0%	± 310
2,500	20.0%	± 500
5,000	19.0%	± 950
7,500	12.0%	± 900
10,000	11.0%	± 1,100
25,000	6.6%	± 1,650
50,000	4.8%	± 2,400

The estimated standard errors were computed by employing a method referred to as replicated half-sampling. This method is used when computational estimates of standard errors are difficult to make. In effect what is done is to subdivide the sample into random subsamples of equal size called replicates and make population estimates of the characteristics of interest (e.g., totals, means or proportions) from each subsample. Then the variance of the estimates of the subsamples provides a (usually) slightly biased overestimate of the estimated variance, had this estimate been made by computational formulas. The replicates (i.e., subsamples) were chosen and variances computed by a computer program written by Westat, Inc. The equation for computing the variance is

$$\hat{s}^2_{\hat{x}} = \frac{1}{R} \sum_{r=1}^{R} (\hat{x}_r - \hat{x}_T)^2$$

where: $\hat{x}_r$ is the estimate of a population characteristic based on the rth half-sample.

$\hat{x}_T$ is the estimate of the same population characteristic based on the full sample.

$r = 1, 2, \ldots, R$

R is the number of replicates, and

$\hat{s}^2_{\hat{x}}$ is the estimated variance of $\hat{x}$.

The number of replicates (R) employed in the estimates in the tables is 32.

Nonsampling Errors

There are several potential sources of nonsampling errors in the Library School and Employer Surveys. The first such source of error involves the inability or unwillingness to look up records to obtain accurate data. This source is particularly relevant as older data are requested (say, 1976/77 data). The amount of error attributable to this

source is not known. However, discussions over the telephone with respondents suggest that it is not a significant source of error. A far greater source of error may involve the use of models to project total librarian supply and demand. Again, we can not measure extent of this error.

Another source of nonsampling error deals with nonrespondents, that is those respondents that refused to answer questions or did not respond even after repeated requests to do so. Nonresponse has been discussed. The overall response rate in the Employer Survey was 74% (ranging from 55% to 93% depending on the type of library). The problem with nonresponses is that the nonrespondent sample may be different from the respondent sample. As response rates get over 60 percent the differences in estimates from the two samples (nonresponse and response) must be quite different to yield appreciably different results for estimates of the entire population. For example, assume that the proportion of librarians that are men is being estimated and that from a sample of 1000 libraries there are 600 responding libraries which yield an estimate of 10 percent male librarians. For the population estimate of male librarians to be as high as 20 percent, the nonrespondents sample of 400 would have to have 35 percent male which is substantially greater than the 10 percent observed in the responding 600. The point is that there has to be something radically different about the nonresponding sample (if response rates are over 60% or so) for the responding sample to show an appreciable difference from the population value.

The same philosophy holds for imputing for missing items, except that the imputations themselves can be biased. That is, the imputed values are usually based on some evidence available from the respondent so that real values should not normally be too different. In the tables in the last part of this subsection the number of imputations performed for the Employer Survey were noted. In the Library School Survey (see Tables A.14 through A.17), the proportion of values imputed to number of responses is particularly high for school library certification characteristics (ranging from 21 percent to 50 percent), but much lower elsewhere. The relative standard errors appear to reflect the imputed values, in that where the proportion of imputed values are high the relative standard deviations are

TABLE A.14--Estimated Values, Sample Size and No. of Imputations for Admissions (1981/82), Completions (1976/82), and Information Professional Placements 1980/81) for Accredited MLS Degree Programs

Characteristic	Estimated Value of Characteristic	Sample Size	No. of Imputations
Total No. of Student Admissions (1981/82)	6,310	52	4
Total No. of Student Completions (1976/77)	6,080	52	1
Total No. of Student Completions (1977/78)	5,500	53	1
Total No. of Student Completions (1978/79)	5,060	53	0
Total No. of Student Completions (1979/80)	4,510	53	0
Total No. of Student Completions (1980/81)	4,200	53	0
Total No. of Student Completions (1981/82 Projection)	4,190	52	2
Total No. of Student Completions-Male (1980/1981)	770	53	1
Total No. of Student Completions-Female (1980/81)	3,430	53	1
Information Professional Placements (1980/81)	196	52	10

TABLE A.15—Estimated Values, Sample Size and No. of Imputations for Admissions (1981/82), Completions (1976/82), and Information Professional Placements (1980/81) for Nonaccredited MLS Degree Programs

Characteristic	Estimated Value of Characteristic	Sample Size	No. of Imputations
Total No. of Student Admissions (1981/82)	860	25	0
Total No. of Student Completions (1976/77)	1,230	27	4
Total No. of Student Completions (1977/78)	1,180	27	4
Total No. of Student Completions (1978/79)	1,040	27	2
Total No. of Student Completions (1979/80)	780	28	2
Total No. of Student Completions (1980/81)	770	26	0
Total No. of Student Completions (1981/82 Projection)	730	25	2
Information Professional Placements (1980/81)	5	26	6

TABLE A.16—Estimated Values, Sample Size and No. of Imputations for Admissions (1981/82), Completions (1976/82), Completions by Sex (1980/81), and Information Professional Placements (1980/81) for Bachelor's in Library Science Degrees Programs

	Estimated Value of Characteristic	Sample Size	No. of Imputations
Total No. of Student Admissions (1981/82)	310	29	7
Total No. of Student Completions (1976/77)	480	28	3
Total No. of Student Completions (1977/78)	420	28	2
Total No. of Student Completions (1978/79)	400	28	0
Total No. of Student Completions (1979/80)	370	29	1
Total No. of Student Completions (1980/81)	310	29	6
Total No. of Student Completions (1981/82 Projection)	270	29	3
Total No. of Student Completions-Male (1980/81)	17	29	1
Total No. of Student Completions-Female (1980/81)	290	29	6
Information Professional Placements (1980/81)	22	29	6

TABLE A.17--Estimated Values, Sample Size and No. of Imputations for Admissions (1981/82), Completions (1976/82), Completions by Sex (1980/81), and Information Professional Placements (1980/81), for School Library Certification Programs

	Estimated Value of Characteristic	Sample Size	No. of Imputations
Total No. of Student Admissions (1981/82)	2,170	118	43
Total No. of Student Completions (1976/77)	2,620	123	43
Total No. of Student Completions (1977/78)	2,380	123	36
Total No. of Student Completions (1978/79)	2,190	124	32
Total No. of Student Completions (1979/80)	1,980	124	28
Total No. of Student Completions (1980/81)	1,700	123	27
Total No. of Student Completions (1981/82 Projection)	1,620	121	31
Total No. of Student Completions-Male (1980/81)	140	123	33
Total No. of Student Completions-Female (1980/81)	1,560	123	33
Information Professional Placements (1980/81)	47	123	61

high. This could reflect, however, the fact that these observations are either infrequent or hard to identify, e.g., for estimates of total placement of information professionals. For the Employer Survey, we find similar results, although the proportion of items imputed is generally much lower than with the Library School Survey. There are no instances where the proportion of imputed items is over 7 percent of the responses.

Analysis was performed to see if the relative standard errors of estimates were affected by the amount of imputation necessary. It was found that the values of relative standard errors were not correlated to the proportion of observations that were imputed.

Efficiency of the Sample Design

Sample surveys can be done by having each unit sampled be chosen with equal probability. This kind of sample is referred to as a simple random sample. Statisticians usually recommend other sample designs in order to either reduce data collection costs (e.g., cluster sampling) or to improve the precision of estimates (e.g., stratified random sampling or using ratio estimates with probability of selection in proportion to size). In the former instance, some precision is lost; that is, the standard error should be greater than one estimated from a simple random sample. A measure of the efficiency of the sample design is the design effect which is the ratio of the square route of the standard error estimated from the sample divided by the standard error which would occur from a simple random sample. Unfortunately, the estimate of standard error from a simple random sample can be computed only from an estimate of a proportion. In this study such comparisons can only be made for estimates that could be expressed as proportions, e.g. the number of MLS graduates hired which is estimated from the Employer Survey. Such comparisons are shown in Table A.18.

TABLE A.18—Estimated Design Effect for Selected Characteristics, Employer Survey: 1982

Characteristic	Design Effect
Public Libraries	
Information Professionals Hired (1981)	0.8
MLS Graduates Hired (1981)	0.9
Academic Libraries	
Information Professionals Hired (1981)	1.0
MLS Graduates Hired (1981)	1.0
School Libraries	
Information Professionals Hired (1981)	1.7
MLS Graduates Hired (1981)	1.8
Special Libraries	
Information Professionals Hired (1981)	1.6
MLS Graduates Hired (1981)	2.0

When the values of the design effects are less than one, the sample design employed yields a better result (from the standpoint of sampling error) than a simple random sample of individuals would. On the other hand some efficiency is lost when the values of the design effects are greater than one. As it turns out, two of the estimates are improved by the design employed, two are about the same, and four are worse. Thus, on balance one would conclude that the design lost some precision from the standpoint of sampling errors. However, since a simple random sample of individuals would be costly, if not impossible, it appears that the design employed was satisfactory.

EXHIBIT A.1

DEPARTMENT OF EDUCATION
NATIONAL CENTER FOR EDUCATION STATISTICS
OFFICE OF LIBRARIES AND LEARNING TECHNOLOGIES
WASHINGTON, D.C. 20202

LIBRARY HUMAN RESOURCES EMPLOYER SURVEY

FORM APPROVED
OMB NO. 1850-0082
APPROVAL EXPIRES August 31, 1984

IDENTIFICATION NUMBER

DUE DATE: June 4, 1982

NAME AND ADDRESS OF INSTITUTION

IF THE ABOVE ADDRESS IS INCORRECT IN ANY WAY, PLEASE WRITE CORRECTIONS IN THIS SPACE.

NAME OF PERSON COMPLETING THIS FORM

TITLE	TELEPHONE *(area code, number, extension)*

PURPOSE OF THIS SURVEY: This survey will provide current information about the employment of professionals and non-professionals within libraries. These data will be used in the development of programs by the Office of Libraries and Learning Technologies of the Department of Education. They will also be used by the profession as a whole, libraries, and library educators.

This report is authorized by law (20 U.S.C. 1221e-1). Your cooperation is voluntary, but it is needed to make the results of this survey comprehensive, accurate, and timely.

Please read the enclosed instructions as you complete this form.

Return in the enclosed postage-paid envelope to:

King Research, Inc.
P.O. Box 71
Rockville, MD 20850
(301) 881-6766

If you have questions call the Survey Director, Ellen Sweet of King Research, Inc. at the above number; or, call the Project Officer, Helen Eckard of NCES, at (301) 436-6662.

ED (NCES) FORM 2425, 4/82 PREVIOUS EDITIONS ARE OBSOLETE

DEPARTMENT OF EDUCATION
NATIONAL CENTER FOR EDUCATION STATISTICS
AND
OFFICE OF LIBRARIES AND LEARNING TECHNOLOGIES
WASHINGTON, D.C. 20202

FORM APPROVED
OMB No. 1850-0062
APPROVAL EXPIRES: 7/31/84

LIBRARY HUMAN RESOURCES EMPLOYER SURVEY

READ THESE INSTRUCTIONS before completing this form. Mail the completed form to:

King Research
P.O. Box 71
Rockville, MD 20850
(301) 881-6766

GENERAL INSTRUCTIONS AND DEFINITIONS

This report is concerned with library employees. Do not leave any item blank. Enter "0" if the appropriate entry for an item is zero or none. Enter "NA" if an item does not apply to your institution. If an exact figure is not available for a particular item, but you know that the amount is greater than zero, ENTER AN ESTIMATE OF THE AMOUNT.

REPORTING YEAR IS THE FISCAL YEAR ENDING IN 1981, UNLESS OTHERWISE INDICATED.

Definitions

LIBRARY. An organization which maintains and controls an organized collection of printed materials, other graphic materials, and/or nonprint media; which provides a regular staff which acquires and organizes materials, facilitates use of the collection, and delivers services to the library's clientele; and which maintains an established schedule in which the services of the staff are available to the clientele.

LIBRARIAN. A staff member doing work that requires professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect. While a librarian will normally possess a Master's in Library Science or equivalent degree, for purposes of this survey librarians are defined by their job responsibilities rather than their educational qualifications.

PUBLIC LIBRARY. Serves all residents of a given community, district, or region, and receives its financial support, in whole or in part, from public funds.

ACADEMIC LIBRARY. Forms an integral part of a college, university, or other academic institution for postsecondary education; is organized and administered to meet the needs of students, faculty, and affiliated staff of the institution or of a portion of that institution.

SPECIAL LIBRARY. Serves a business firm, professional association, government agency, or other organized group, and does not meet the criteria for an academic, public, or school library; or is maintained by a parent organization to serve a specialized clientele. This category includes independent research libraries and libraries serving corporate organizations, Federal, State, and local agencies, and other groups. Includes state library agencies.

PART I – DESCRIPTIVE INFORMATION

Specific Instructions

LOCAL EDUCATION AGENCY, (Line 1). An educational agency at the local level which exists primarily to operate schools or to contract for educational services; it may also be called a school district, school system, or local basic administrative unit.

If you have checked any of lines (1) through (4) of Part I DO NOT CONTINUE. Please return the questionnaire in the enclosed postage-paid envelope. Thank you for your cooperation.

If none of lines (1) through (4) applies to your organization, PLEASE CONTINUE.

THIS QUESTIONNAIRE IS INTENDED FOR LIBRARIES AND FOR LOCAL EDUCATION AGENCIES WHICH ADMINISTER ONE OR MORE LIBRARY/MEDIA CENTERS. IF ANY OF THE BELOW DESCRIBE YOUR ORGANIZATION, PLEASE CHECK THE APPROPRIATE CATEGORY:

1. ☐ LOCAL EDUCATION AGENCY WITH NO LIBRARY /MEDIA CENTER
2. ☐ BUSINESS OR NON-PROFIT ORGANIZATION WITH NO LIBRARY
3. ☐ THE ORGANIZATION TO WHICH THE QUESTIONNAIRE IS ADDRESSED NO LONGER EXISTS
4. ☐ OTHER ORGANIZATION WITH NO LIBRARY. PLEASE EXPLAIN:

If you have checked any of the above, please do not continue. Return the questionnaire in the enclosed postage-paid envelope. Thank you for your cooperation.

If none of the above applies to your organization, please continue.

PART II – LIBRARY STAFFING

Specific Instructions

QUESTION 2A - NUMBER OF EMPLOYEES BY TYPE OF POSITION, JANUARY 1, 1982. Report all individuals employed in your library on or about January 1, 1982. EXCLUDE maintenance and custodial staff, students paid on an hourly basis, and positions that are currently vacant. Religious institutions or those affiliated with religious or theological organizations should INCLUDE contributed services staff (for example, members of religious orders who receive little or no pay because of the rules or customs of their order).

FULL-TIME EMPLOYEES (Lines 5-8). Includes all paid employees who work the full-time work week established for your library. Do not include volunteers.

PART-TIME EMPLOYEES (Lines 5-8). Report all paid employees who work less than the full-time work week for your library. Do not include volunteers.

FULL-TIME EQUIVALENCY OF PART-TIME EMPLOYEES (Lines 5-8). To compute the full-time equivalency (FTE) of part-time employees, divide the number of hours worked per week by the part-time employee by the number of hours in your full-time work week. For example, a part-time employee who works 25 hours per week in a library having a 40 hour work week: 25 divided by 40 equals .6 FTE.

LIBRARIANS (Line 6). Staff members doing work that requires professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect.

OTHER PROFESSIONAL (Line 6). Persons who though not librarians are in positions normally requiring at least a Bachelor's degree in some other field (e.g., curators, archivists, computer specialists, subject bibliographers, etc.).

TECHNICAL, CLERICAL, AND OTHER SUPPORT STAFF (Line 7). Report persons in technical assistance and clerical positions who are specifically assigned to the library and included in the library budget. Do NOT report custodial, maintenance, or student employees.

QUESTION 2B - POSITIONS UNFILLED, FULL-TIME EQUIVALENCY, JANUARY 1, 1982. *Report all budgeted library positions that* were vacant on or about January 1, 1982, in full-time equivalency. For definitions, see Question 2A.

QUESTION 2C - LIBRARY POSITIONS, PREVIOUS YEARS, FULL-TIME EQUIVALENCY. Report the total number of positions budgeted in full-time equivalency for each fiscal year from 1978 through 1981. For example, fiscal year 1978 is your fiscal year that ended any time between January 1 and December 31, 1978. Exclude maintenance and custodial staff and student employees paid on an hourly basis.

For definitions, See Question 2A.

A. REPORT THE NUMBER OF INDIVIDUALS EMPLOYED BY YOUR INSTITUTION ON OR ABOUT JANUARY 1, 1982. EXCLUDE MAINTENANCE AND CUSTODIAL STAFF, AND STUDENTS PAID ON AN HOURLY BASIS.

Number of employees by type of position, January 1, 1982

Type of position	Full-time (in whole numbers)	Part-time	
		Number of persons (in whole numbers)	Full-time equivalency (in tenths)
5. LIBRARIANS			
6. OTHER PROFESSIONALS			
7. TECHNICAL, CLERICAL, AND OTHER SUPPORT STAFF			
8. **TOTAL**			

PART II – Continued

B. REPORT ALL BUDGETED POSITIONS CURRENTLY UNFILLED WITHIN YOUR INSTITUTION. EXCLUDE MAINTENANCE AND CUSTODIAL STAFF, AND STUDENTS PAID ON AN HOURLY BASIS.

Positions unfilled, full-time equivalency, January 1, 1982

Category	Number of positions
9. LIBRARIAN	
10. OTHER PROFESSIONAL	
11. TECHNICAL, CLERICAL, OTHER SUPPORT	

C. REPORT TOTAL BUDGETED POSITIONS IN FULL-TIME EQUIVALENCY, BY FISCAL YEAR. EXCLUDE MAINTENANCE AND CUSTODIAL STAFF, AND STUDENTS PAID ON AN HOURLY BASIS.

INDICATE THE FIRST MONTH OF THE FISCAL YEAR USED IN REPORTING DATA IN THIS AND SUBSEQUENT PARTS OF THE QUESTIONNAIRE. _____

Library positions, previous years, full-time equivalency

D.	Fiscal years			
	1978	1979	1980	1981
12. LIBRARIANS				
13. OTHER PROFESSIONALS				
14. TECHNICAL, CLERICAL, OTHER SUPPORT				

PART III – EDUCATION AND SEX OF LIBRARIANS

Specific Instructions

Count each librarian currently employed in your library (reported on line 5) according to his or her sex and educational attainment. Count each person only once. Lines 15 through 21 apply to employees with library degrees or certification; lines 22 through 25 apply to employees without library degrees or certification.

MLS DEGREE ONLY (Line 15). Includes recipients of post-Bachelor's degrees in Library Science, such as Master of Librarianship, Master of Library Studies, Master of Library Service, or Master of Arts in Librarianship without any other graduate degree.

MLS PLUS ANOTHER GRADUATE DEGREE (Line 16). Include recipients of a second Master's degree in another field or of a sixth-year certificate in library science. Do not include individuals with an MLS plus school library certificate; count them on line 15.

MLS, UNKNOWN WHETHER OTHER GRADUATE DEGREE (Line 17). Includes recipients of post-Bachelor's degrees in Library Science whose other graduate degree status is unknown to you.

4-YEAR BACHELOR'S DEGREE IN LIBRARY SCIENCE (Line 18). Includes individuals with an undergraduate degree in Library Science requiring at least 4 years but less than 5 years of academic work beyond high school. Does NOT include individuals with Associate of Arts (A.A.) degrees.

5TH-YEAR BACHELOR'S IN LIBRARY SCIENCE Line 19). Includes individuals with a Bachelor's in Library Science (BLS) which requires an additional year of study beyond the baccalaureate.

SCHOOL LIBRARY CERTIFICATE (Line 20). Includes individuals who have NO degree in Library Science but who have been awarded a state or local school library certificate, usually on completion of a prescribed program of study beyond the bachelor's level. If an individual has a degree listed on lines 15 through 19 and a school library certificate, count him or her on one of lines 15 through 19.

OTHER LIBRARY DEGREE OR CERTIFICATE (Line 21). Includes recipients of library degrees or certificates not covered in lines 15 through 20.

GRADUATE DEGREE(S) (Line 22). Includes employees without library degrees or certificates but with a post-Bachelor's degree or degrees.

BACHELOR'S DEGREE (Line 23). Includes employees without library degrees or certificates but with Bachelor's degrees.

OTHER (Line 24). Includes employees without library degrees or certificates and without Bachelor's or Graduate degrees.

UNKNOWN (Line 25). Includes employees without library degrees or certificates whose other degree status is unknown.

REPORT ALL LIBRARIANS CURRENTLY EMPLOYED BY YOUR INSTITUTION *(reported on line 5)* ACCORDING TO EACH PERSON'S SEX AND EDUCATIONAL ATTAINMENT. COUNT EACH PERSON ONLY ONCE.

Education	Men	Women	TOTAL
A. LIBRARY DEGREE OR CERTIFICATION 15. MLS ONLY			
16. MLS PLUS OTHER GRADUATE DEGREE(S)			
17. MLS, OTHER DEGREE STATUS UNKNOWN			
18. 4-YEAR BACHELOR'S IN LIBRARY SCIENCE (BLS)			
19. 5TH YEAR BACHELOR'S IN LIBRARY SCIENCE (BLS)			
20. SCHOOL LIBRARY CERTIFICATE *(not reported in lines 15-19)*			
21. OTHER LIBRARY DEGREE OR CERTIFICATE *(Specify)* _____			
B. NO LIBRARY DEGREE OR CERTIFICATION 22. GRADUATE DEGREE(S)			
23. BACHELOR'S DEGREE			
24. OTHER *(Specify)* _____			
25. UNKNOWN			
26. TOTAL			

PART IV – NEWLY-HIRED LIBRARIANS

Specific Instructions

A newly-hired librarian may be a recent graduate, a transfer from another position, or someone who has been temporarily unemployed or out of the labor force. Describe the librarians hired by your institution during the fiscal year ending between January 1 and December 31, 1981, according to each person's most recent previous status unless otherwise indicated. Count only librarians (individuals who were reported on line 5). If more than one source applies, count the person under the one that appears first on the list. Use your own best information.

NEW GRADUATES OF PROFESSIONAL LIBRARY PROGRAMS (Lines 27 through 30). Count here individuals who have not been employed since completing these programs, and, if unemployed, were unemployed for less than three months.

MLS (Line 27). See line 15.

4-YEAR BLS (Line 28). See line 18.

SCHOOL LIBRARY CERTIFICATE (Line 29). See line 20.

OTHER ACADEMIC PROGRAMS (Line 30). Academic programs other than those in lines 27 through 29. Include librarians who have most recently been in a degree program in fields other than library science, or in a 6th-year certificate or a doctoral program in library science.

NON-LIBRARY INFORMATION PROFESSIONAL POSITION (Line 35). A position in an institution other than a library that requires specialized information-related training or knowledge, and in which the individual performs information-related functions.

LIBRARY TECHNICAL, CLERICAL, OR OTHER SUPPORT STAFF PROMOTED TO LIBRARY POSITIONS (Line 36). Count here individuals who were employed by your library in non-professional positions and who were promoted into professional librarian positions.

ANY OTHER EMPLOYMENT (Line 37). Count here all individuals who were employed before accepting a position in your library, but were not counted on lines 31 through 36.

UNEMPLOYED BUT ACTIVELY SEEKING WORK (Line 38). Includes all individuals who had been unemployed for three months or more, and actively seeking work, at the time your library hired them. Individuals who had been unemployed for less than three months should be counted on the line that most closely describes their activities prior to their period of employment.

UNKNOWN OR OTHER (Line 39). Count all librarians hired during the fiscal year ending in 1981 who were not counted on lines 27 through 38.

DESCRIBE THE LIBRARIANS HIRED BY YOUR INSTITUTION DURING THE FISCAL YEAR ENDING IN 1981, ACCORDING TO SOURCE OR PREVIOUS EMPLOYMENT STATUS. IF MORE THAN ONE SOURCE APPLIES, COUNT THE PERSON UNDER THE ONE THAT APPEARS FIRST ON THE LIST.

Source or previous status	Number of librarians
A. NEW GRADUATES OF PROFESSIONAL LIBRARY PROGRAMS 27. MLS	
28. 4-YEAR BLS	
29. SCHOOL LIBRARY CERTIFICATE	
30. OTHER ACADEMIC PROGRAMS	
B. TRANSFERS FROM OTHER EMPLOYMENT 31. PUBLIC LIBRARY	
32. ACADEMIC LIBRARY	
33. SCHOOL LIBRARY	
34. SPECIAL LIBRARY	
35. NON-LIBRARY INFORMATION PROFESSIONAL POSITION	
36. LIBRARY TECHNICAL, CLERICAL OR OTHER SUPPORT STAFF EMPLOYED BY YOUR LIBRARY AND PROMOTED TO ANOTHER POSITION	
37. ANY OTHER EMPLOYMENT	
C. NEITHER EMPLOYED NOR IN SCHOOL 38. UNEMPLOYED BUT ACTIVELY SEEKING WORK	
39. UNKNOWN OR OTHER	
40. TOTAL	

PART V – SUBSEQUENT EMPLOYMENT STATUS OF LIBRARIANS WHO LEFT YOUR INSTITUTION

Specific Instructions

Part V asks what happened to professional librarians who left your institution's employment within the fiscal year ending between January 1 and December 31, 1981. Please answer according to your best information. If an individual was unemployed for less than three months and subsequently took a job, returned to school, etc., do not count him or her as unemployed, but count according to his or her subsequent status.

NON-LIBRARY INFORMATION PROFESSIONAL POSITION (Line 45). A position in an institution other than a library that requires specialized information-related training or knowledge, and in which the individual performs information-related functions.

ANY OTHER EMPLOYMENT (Line 46). Report here all individuals who obtained employment but were not counted on lines 41 through 45.

RETURNED TO SCHOOL (Line 47). Includes all individuals who left your employment to enroll full-time (at least 75% of normal full-time course load) in school.

NON EMPLOYED AND NOT SEEKING WORK (Line 49). Count individuals who retired, left the labor force to pursue other interests (temporarily or permanently), or otherwise did not seek employment upon leaving your institution.

UNKNOWN OR OTHER (Line 51). Count here all librarians who left your employment during the year and have not been reported on lines 41 through 50.

REPORT THE NUMBER OF LIBRARIANS WHO LEFT YOUR INSTITUTION'S EMPLOY DURING THE FISCAL YEAR ENDING BETWEEN JANUARY 1 AND DECEMBER 31, 1981 ACCORDING TO EACH PERSON'S SUBSEQUENT EMPLOYMENT STATUS. IF MORE THAN ONE ITEM APPLIES, COUNT THE PERSON UNDER THE ONE THAT APPEARS FIRST.

Position	Number of librarians
A. EMPLOYED	
41. PUBLIC LIBRARY	
42. SCHOOL LIBRARY	
43. ACADEMIC LIBRARY	
44. SPECIAL LIBRARY	
45. NON-LIBRARY PROFESSIONAL POSITION	
46. ANY OTHER EMPLOYMENT	
B. NOT EMPLOYED	
47. RETURNED TO SCHOOL	
48. UNEMPLOYED, BUT ACTIVELY SEEKING WORK	
49. NON EMPLOYED AND NOT SEEKING WORK	
50. DIED	
51. UNKNOWN OR OTHER	
52. TOTAL	

EXHIBIT A.2

DEPARTMENT OF EDUCATION
NATIONAL CENTER FOR EDUCATION STATISTICS
OFFICE OF LIBRARIES AND LEARNING TECHNOLOGIES
WASHINGTON, D.C. 20202

LIBRARY HUMAN RESOURCES
LIBRARY SCHOOL SURVEY

FORM APPROVED
OMB NO. 1850-0082
APPROVAL EXPIRES August 31, 1984.

IDENTIFICATION NUMBER

DUE DATE: **June 25, 1982**

NAME AND ADDRESS OF INSTITUTION

IF THE ABOVE ADDRESS IS INCORRECT IN ANY WAY, PLEASE WRITE CORRECTIONS IN THIS SPACE.

NAME OF PERSON COMPLETING THIS FORM

TITLE	TELEPHONE *(area code, number, extension)*

PURPOSE OF THIS SURVEY: This survey will provide current information about programs, students admitted, degrees granted, and placement of graduates of professional library programs. This information will be used in the development of programs by the Office of Libraries and Learning Technologies of the Department of Education, as well as being of use to the profession as a whole, libraries, and library educators.

This report is authorized by law (20 U.S.C. 1221e-1). Your cooperation is voluntary, but it is needed to make the results of this survey comprehensive, accurate, and timely.

Please read the enclosed instructions as you complete this form.

Return in the enclosed postage-paid envelope to:

King Research, Inc.
P.O. Box 71
Rockville, MD 20850
(301) 881-6766

If you have questions call the Survey Director, Ellen Sweet of King Research, Inc. at the above number; or, call the Project Officer, Helen Eckard of NCES, at (301) 436-6662.

DEPARTMENT OF EDUCATION
NATIONAL CENTER FOR EDUCATION STATISTICS
AND
OFFICE OF LIBRARIES AND LEARNING TECHNOLOGIES
WASHINGTON, D.C. 20202

FORM APPROVED
OMB No. 1850-0082
APPROVAL EXPIRES: 8/31/84

LIBRARY HUMAN RESOURCES
LIBRARY SCHOOL SURVEY

READ THESE INSTRUCTIONS before completing this form. Mail the completed form to:

King Research
P.O. Box 71
Rockville, MD 20850
(301) 881-6766

GENERAL INSTRUCTIONS AND DEFINITIONS

This report is concerned with educational programs that train students to be professional librarians.

Do not leave any item blank. Enter "0" if the appropriate entry for an item is zero or none. Enter "NA" if an item does not apply to your institution. If an exact figure is not available for a particular item, but you know that the amount is greater than zero, ENTER AN ESTIMATE OF THE AMOUNT. Estimates are important if exact data are not available.

PREFERRED REPORTING YEAR IS THE ACADEMIC YEAR. IF POSSIBLE, USE ACADEMIC YEAR BEGINNING IN JULY AND ENDING IN JUNE. INDICATE IN PART III THE FIRST MONTH OF THE ACADEMIC YEAR USED. IF DATA ARE ALREADY COMPILED FOR CALENDAR YEARS, PROVIDE CALENDAR YEAR 1977 DATA IN PLACE OF ACADEMIC YEAR 1977-78, CY 1978 DATA IN PLACE OF ACADEMIC YEAR 1978-79, AND SO ON, INDICATING JANUARY AS THE FIRST MONTH OF THE REPORTING YEAR.

Definitions

MASTER'S DEGREE IN LIBRARY SCIENCE (MLS). A Master's program in library science requires successful completion of at least one and sometimes two academic years of work beyond the bachelor's degree.

Includes Master of Library Science (M.L.S.), Master of Arts, (M.A.), Master of Arts in Librarianship (M.A.L.), Master of Arts in Library and Information Science (M.A.L.I.S.), Master of Arts in Library Science (M.A.L.S.), Master of Law Librarianship (M.L.L.), Master of Library Studies (M.L.S.), Master of Science (M.S.), Master of Science in Librarianship (M.S.L.), Master of Science in Library Media (M.S.L.M.), Master of Science in Library Science (M.S.L.S.), Master of Science in Library Service (M.S.L.S.).

BACHELOR'S DEGREE IN LIBRARY SCIENCE (BLS). Requires successful completion of at least four but less than five years of academic work beyond high school with a major in library science. Includes four-year Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Bachelor of Science/Library Science (B.S.L.S.).

SCHOOL LIBRARY CERTIFICATE. Indicates successful completion of a prescribed program of study at either the graduate or undergraduate level that does not lead to a degree but fulfills State or local requirements for a school library certificate. This includes programs that are part of a certification or degree program in education or another non-library science field, other than an undergraduate minor.

PART I – PROGRAMS OF STUDY

Specific Instructions

Check as many of the programs of study listed as apply to your institution.

UNDERGRADUATE MINOR IN LIBRARY SCIENCE. (Line 1). A prescribed program of study at the undergraduate level not leading to a degree in library science, but taken in conjunction with a Bachelor's level major.

ASSOCIATE DEGREE IN LIBRARY SCIENCE. (Line 2). A degree granted for the successful completion of a program of studies in library science requiring at least two but less than four years (or equivalent) of full-time college level study.

SCHOOL LIBRARY CERTIFICATION (Line 3). See definitions, Page 2 of this form. If students receive both a school library certificate and a degree listed on lines 4 through 6, report this program under the appropriate degree, not on this line.

MASTER'S DEGREE IN LIBRARY SCIENCE, A.L.A.-ACCREDITED (Line 5). See definitions, page 2. A.L.A.-accredited programs are those accredited by the American Library Association for Academic Year 1981-82.

MASTER'S DEGREE IN LIBRARY SCIENCE, NOT A.L.A.-ACCREDITED (Line 6). See line 5.

6TH YEAR CERTIFICATE (Line 7). A certificate awarded for completion of a post-Master's program, usually one year in duration.

DOCTORATE (Line 8). Includes Doctor of Philosophy (Ph.D.), Doctor of Arts (D.A.), Doctor of Library Science (D.L.S.).

If your institution does NOT offer one or more of the programs on lines 3 through 6, please do not complete the rest of the questionnaire. Return it in the enclosed postage-paid envelope. Thank you for your cooperation.

INDICATE THE DEGREES AWARDED OR NON-DEGREE PROGRAMS OF STUDY IN LIBRARY SCIENCE OFFERED BY YOUR INSTITUTION. **CHECK AS MANY AS APPLY.**

- ☐ 1. UNDERGRADUATE MINOR IN LIBRARY SCIENCE
- ☐ 2. ASSOCIATE OF ARTS DEGREE IN LIBRARY SCIENCE
- ☐ 3. SCHOOL LIBRARY CERTIFICATION (NO LIBRARY DEGREE AWARDED)
- ☐ 4. BACHELOR'S DEGREE IN LIBRARY SCIENCE (BLS)
- ☐ 5. MASTER'S DEGREE IN LIBRARY SCIENCE (MLS), A.L.A.-ACCREDITED
- ☐ 6. MASTER'S DEGREE IN LIBRARY SCIENCE (MLS), NOT A.L.A.-ACCREDITED
- ☐ 7. 6TH YEAR CERTIFICATE IN LIBRARY SCIENCE
- ☐ 8. DOCTORATE
- ☐ 9. OTHER PROGRAMS *(Describe)* : _____

_____

_____

If you have NOT checked one or more of items 3 through 6, DO NOT CONTINUE. Check here ☐ and return this form to King Research, Inc. in the postage-paid envelope provided. Thank you.

If you have checked one or more of items 3, 4, 5, or 6, please continue.

The rest of the questions on this form apply to students completing the programs reported on lines 3 through 6, above.

PART II – APPLICATIONS AND ADMISSIONS

Specific Instructions

APPLICANT (Lines 10, 12, 14). An applicant is a prospective student who has formally requested evaluation of his or her qualifications and approval by the institution to register as a student.

ADMISSION (Lines 11, 13, 15). An admission is a person who has been formally invited to register as a student.

REPORT THE NUMBERS OF APPLICANTS AND OF PERSONS ADMITTED (REGARDLESS OF WHETHER THEY SUBSEQUENTLY ENROLL) TO YOUR INSTITUTION'S LIBRARY SCIENCE PROGRAMS. COUNT EACH PERSON UNDER THE ACADEMIC YEAR DURING WHICH HE OR SHE DID OR WOULD HAVE COMMENCED STUDY.

INDICATE THE FIRST MONTH OF THE ACADEMIC YEAR USED IN REPORTING DATA IN THIS AND SUBSEQUENT PARTS OF THE QUESTIONNAIRE.

Program	Academic Year				
	1977-78	1978-79	1979-80	1980-81	1981-82
SCHOOL LIBRARY CERTIFICATION 10. APPLICANTS					
11. ADMISSIONS					
BACHELOR'S IN LIBRARY SCIENCE 12. APPLICANTS					
13. ADMISSIONS					
MASTER'S IN LIBRARY SCIENCE 14. APPLICANTS					
15. ADMISSIONS					

PART III – STUDENTS COMPLETING PROGRAMS

Specific Instructions

Count the students completing programs in library science by type of program and sex of the individual, by academic year. Count each person only once.

ENTER THE NUMBER OF STUDENTS COMPLETING PROGRAMS IN LIBRARY SCIENCE, ACCORDING TO THE TYPE OF PROGRAM AND SEX OF THE INDIVIDUAL, DURING EACH ACADEMIC YEAR.

Academic Year	Number of completions								
	School library certification			Degree					
				Bachelor's in library science			Master's in library science		
	Men	Women	TOTAL	Men	Women	TOTAL	Men	Women	TOTAL
16. 1976-77									
17. 1977-78									
18. 1978-79									
19. 1979-80									
20. 1980-81									

PART IV – EMPLOYMENT STATUS OF STUDENTS COMPLETING PROGRAMS

Specific Instructions

Part IV asks about each person's first job after completing your institution's program, regardless of how long he or she stayed in that position or any subsequent career changes.

Count each person under the program completed or degree received and the academic year during which he or she completed the program.

LIBRARY (Lines 21 through 26). An organization which maintains and controls an organized collection of printed materials, other graphic materials, and/or non-print media; which provides a regular staff that acquires and organizes materials, facilitates the use of the collection, and delivers services to the library's clientele; and which maintains an established schedule during which the services of that staff are available to clientele.

PROFESSIONAL POSITION (Lines 21 through 24). A position requiring the specialized knowledge acquired in the library science degree program. The position may require an MLS or an equivalent degree or work experience.

PUBLIC LIBRARY (Line 21). A library which serves all residents of a given community, district, or region, and receives its financial support, in whole or in part, from public funds.

ACADEMIC LIBRARY (Line 22). A library which is an integral part of a college, university, or other academic institution for postsecondary education and which is organized and administered to meet the needs of students, faculty, and affiliated staff of the institution or of a portion of that institution.

SCHOOL LIBRARY OR SCHOOL MEDIA CENTER (Line 23). A library which supports the curricular needs of and provides its collection, related equipment, and the services of a staff to students, teachers, and affiliated staff of an elementary or secondary school or combined schools.

SPECIAL LIBRARY (Line 24). A library which serves a business firm, professional association, government agency, or other organized group and does not meet the criteria for an academic, public, or school library; or which is maintained by a parent organization to serve a specialized clientele. This category includes independent special libraries and special libraries serving corporate organizations, Federal, State, and local agencies, and other groups. State library agencies are included here.

NON-PROFESSIONAL LIBRARY POSITION (Line 25). A position in any of the above types of libraries that does not require specialized library training; e.g., library assistant.

NON-LIBRARY INFORMATION PROFESSIONAL POSITION (Line 26). A position in an institution other than a library that requires specialized information-related training or knowledge, and in which the individual performs information-related functions. This includes, but is not limited to, people working in library-related settings but not in libraries such as for bibliographic utilities and networks and those performing information-management functions in business and government other than in libraries.

OTHER EMPLOYMENT (Line 27). Report all individuals who have found employment and are not counted on lines 21 through 26.

FULL-TIME STUDENT (Line 28). Includes students enrolled in an academic program and whose course load or other academic activity is at least 75% of the normal full-time load. Includes, for example, graduates who immediately enter a certificate or doctoral program in library science, or who enroll for an advanced degree in another field.

UNEMPLOYED, BUT SEEKING WORK (Line 29). Includes all graduates who are not currently employed but who are actively seeking employment, in any field. This category is to be used only for 1980-81 graduates who are not yet employed when this form is filled out. Graduates from previous years who are not known to have found employment should be counted on line 31.

UNEMPLOYED, *NOT* SEEKING WORK (Line 30). 1980-81 graduates who are not reported above but who are, for one reason or another, neither employed nor seeking work; for example, persons who did not enter the work force but chose to pursue other interests, temporarily or permanently. Previous years' graduates who fit this category should be reported on line 31.

UNKNOWN AND OTHER (Line 31). Count all students completing programs who have not been reported on lines 21 through 30.

PART IV – Continued

FOR EACH AWARD SHOWN IN PART III, REPORT THE PERSON'S FIRST POSITION AFTER COMPLETING YOUR PROGRAM, REGARDLESS OF WHERE HE/SHE IS NOW. COUNT ALL INDIVIDUALS REPORTED IN PART III.

Employment status	Number of individuals														
	Academic Year														
	1976-77			1977-78			1978-79			1979-80			1980-81		
	School certificate	BLS	MLS	School certificate	BLS	MLS	School certificate	BLS	MLS	School certificate	BLS	MLS	School certificate	BLS	MLS
PROFESSIONAL LIBRARY *POSITIONS*															
21. PUBLIC LIBRARY															
22. ACADEMIC LIBRARY															
23. SCHOOL LIBRARY OR MEDIA CENTER															
24. SPECIAL LIBRARY															
25. NON-PROFESSIONAL LIBRARY POSITIONS															
26. NON-LIBRARY INFORMATION PROFESSIONAL POSITIONS															
27. OTHER EMPLOYMENT															
28. FULL-TIME STUDENT															
29. UNEMPLOYED, BUT SEEKING WORK															
30. UNEMPLOYED, **NOT** SEEKING WORK															
31. UNKNOWN AND OTHER															
32. TOTAL															

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PART V – PROJECTIONS

Specific Instructions

Enter your best estimate of the number of library science degrees that your institution will award or the number of persons who will complete school library certificate programs at your institution. If you intend to discontinue a program enter "0" for the years after its dissolution. If you intend to add a program, enter the number of individuals that you expect to graduate from it each of the years that it will exist. If you do not offer a program and do not intend to, enter "NA."

ENTER THE NUMBER OF STUDENTS EXPECTED TO COMPLETE LIBRARY SCIENCE PROGRAMS, BY YEAR.

Program	Academic Year				
	1981-82	1982-83	1983-84	1984-85	1985-86
33. SCHOOL LIBRARY CERTIFICATION					
34. BACHELOR'S DEGREE IN LIBRARY SCIENCE					
35. MASTER'S DEGREE IN LIBRARY SCIENCE					

APPENDIX B
DEMAND PROJECTIONS

by Michael D. Cooper

To project library employment, public, academic, school (public and private), and special libraries were considered independently. The approach taken to the development of projections of demand in these areas was to fit equations to historical data, project the values of the equations, adjust the equations to conform to the survey benchmark values of employment in each sector, recalculate the regression projections in light of the benchmark data, and then apply professional judgement to the results to determine the final projected levels of employment. This chapter discusses the application of these methods for each type of library.

B.1 Public Library Employment

Employment projections for public librarians were developed through a model which explained historical variations in the number of public librarians employed. The objective was to identify a set of variables exogenous to the library system whose variations logically explained changes in the employment of librarians. Previous research [36,37] and current investigation into the problem indicated several variables that were likely candidates. Those included personal income, property tax revenue, school age population, and total population. Personal income was considered as an explanatory variable because some studies have shown that individuals with high incomes are more likely to use public libraries than those with low incomes. Property tax revenue was considered because it is an important source of funds for libraries. School enrollment at the elementary and secondary level and adult population were also considered because they both represent the client groups served by public libraries.

The model that was finally decided upon after some experimentation explained employment of public librarians by adult population and primary and secondary school enrollment. The experimentation was done with

ordinary least squares regressions on models containing the variables. The model that most satisfactorily explained the historical variations in number of public librarians employed in the United States (PL) had the form:

$$\ln\frac{PL_t}{PL_{t-1}} = a + b_1 \ln\frac{P_{t-2}}{P_{t-3}} + b_2 \ln\frac{P_{t-4}}{P_{t-5}} + b_3 \ln\frac{E_{t-2}}{E_{t-3}} + b_4 \ln\frac{E_{t-4}}{E_{t-5}} + b_5 \ln\frac{P_t}{P_{t-1}} - b_5 \ln\frac{P_{t-1}}{P_{t-2}} \qquad (1)$$

where E is enrollment in public elementary and secondary schools and P is the difference between the population in the United States and enrollment in elementary and secondary schools.

The ratios found in the model (such as $\ln PL_t/PL_{t-1}$) represent the natural logarithm of the successive differences of values. The purpose of using that form is to eliminate serial correlation as much as possible. The presence of serial correlation reduces the efficiency of the estimation procedure. The result of the reduction in efficiency is that relationships are accepted as valid when they are not.

The adult population and elementary enrollment variables each occur twice in the equation. It was found that the rate of change of the number of librarians was positively related to the second difference of the current population change, negatively related to the rate of change of the adult population four years ago, and positively related to the rate of change of the adult population two years ago. It is similarly related to the rate of change in enrollment four and two years ago respectively. Those effects can be interpreted as meaning that two factors are at work. One is a long term effect to which professional staffing levels respond, and the second is a more immediate effect.

The final term in the equation, $\ln P_t/P_{t-1} - \ln P_{t-1}/P_{t-2}$, is termed an accelerator. The acceleration effect captures the result of moving from one rate of change to another. Once the new rate of change has been achieved, the acceleration effect disappears. The import of the acceleration effect is that when there are changes in the rates of change there is an additional one-time effect. The presence of such an effect may be due to the indivisibility of factor supply or to the presence of other fixed factors.

The values of the parameters of the equation that resulted from an ordinary least squares fit using population data from Table B.1 and enrollment data from Table 38 are given below.

Parameter	Parameter Estimate	Standard Error	T Ratio
a	-0.101064	0.024	-4.20
b_1	15.354244	2.092	7.34
b_2	-5.694516	1.748	-3.26
b_3	4.273680	0.590	7.25
b_4	-2.003438	0.501	-4.00
b_5	2.859960	0.702	4.07

The R^2 value for the equation was 0.88, the F-ratio was 15.01, and the value of the Durbin-Watson D statistic was 2.68.

Projections of the demand for public librarians were made using the equation described above, along with projections of the population of the United States (Table B.2) and projections of elementary and secondary school enrollment (see Table B.6). Population projections are computed based on fertility assumptions. In Table B.2, series I assumes 2.7 births per woman, series II assumes 2.1, and series III assumes 1.7.

TABLE B.1--United States Population: 1952-1982
(Thousands)

Year	Total Population
1952 1/	157,533
1953 1/	160,184
1954 1/	163,026
1955 1/	165,931
1956 1/	168,903
1957 1/	171,984
1958 1/	174,882
1959 1/	177,830
1960 1/	180,671
1961 1/	183,691
1962 1/	186,538
1963 1/	189,242
1964 1/	191,889
1965 1/	194,303
1966 1/	196,560
1967 1/	198,712
1968 1/	200,706
1969 1/	202,677
1970 2/	205,052
1971 2/	207,661
1972 2/	209,896
1973 2/	211,909
1974 2/	213,854
1975 2/	215,973
1976 2/	218,035
1977 2/	220,239
1978 2/	222,585
1979 2/	225,055
1980 2/	227,658
1981 2/	229,805
1982 3/	223,000

SOURCES: 1/ [157], p. 11.
2/ [158]
3/ Estimated.

TABLE B.2--Projections of the Total Population of the United States: 1983-1990 (Thousands)

Year	Total Population 1/		
	Series I	Series II	Series III
1983	233,675	234,193	234,940
1984	235,544	236,413	237,620
1985	237,366	238,648	240,364
1986	239,133	240,892	243,164
1987	240,837	243,133	246,010
1988	242,472	245,362	248,888
1989	244,030	247,566	251,785
1990	245,507	249,731	254,686

1/ The average number of lifetime births per woman are: Series I -- 2.7; Series II -- 2.1; Series III -- 1.7.

SOURCE: [198], p. 4.

Table B.3 summarizes the results of the projections for the three different population projections and the single projection of enrollment. The three projected series all have the same values for 1983 and 1984 because the projections are based on actual historical population and enrollment data for preceding years. The 1985 values are based on projected enrollment and population.

The low estimate of public librarian employment shows a drop from 31,300 in 1983 to 28,500 by 1990. The high estimate assumes employment levels will increase by an average of about 1,200 librarians per year. The intermediate projection shows employment rising from 31,300 in 1983 to 33,700 in 1990, about a 1 percent average annual increase.

B.2 College and University Librarian Employment

Several independent variables were used to explain the variations in number of college and university librarians employed in the United States. They include total enrollment in higher education, expenditures on higher education, and the number of teachers in colleges and universities. The model selected as best fitting the data was:

$$\ln (CL_t/CL_{t-1}) = a + b_1 \ln (H_t/H_{t-1}) + b_2 \ln (H_{t-4}/H_{t-5}) \qquad (2)$$

where CL is the number of college and university librarians and H is total enrollment in all types of colleges and universities. As in the other regression models, the natural logarithms of the ratios compute rates of changes for the variables.

TABLE B.3--Projected Employment of Public Librarians in the United States: 1983-1990

Year	Projected FTE Number of Librarians 1/		
	Low Estimate	Intermediate Estimate	High Estimate
1983	31,300	31,300	31,300
1984	30,500	31,100	31,900
1985	30,000	31,300	33,200
1986	29,900	31,800	34,600
1987	29,800	32,400	36,200
1988	29,600	33,000	37,900
1989	29,200	33,500	39,500
1990	28,500	33,700	41,100

1/ Estimated by King Research, Inc., Library Human Resources Study, 1983.

The equation was fitted to historical data on the number of college and university librarians (see Table 37) and data on enrollment (see Table 33). The following results were obtained:

Parameter	Parameter Estimate	Standard Error	T Ratio
a	-0.020217	0.0157	-1.28
b_1	0.522841	0.1343	3.89
b_2	0.35062	0.1811	1.94

The R^2 for the equation was 0.66, the F-ratio was 10.87, and the Durbin-Watson D statistic was 2.10.

Projected enrollment figures from NCES were used (Table B.4) with the equation above to make final projections of the number of college and university librarians. The results of the projections are given in Table B.5.

The low estimate of employment shows that there will be 23,200 college and university librarians in 1983. As enrollment declines this value will decline to 19,900 in 1990. The intermediate projection yields a 1990 employment level of 20,500 librarians, and the high estimate results in an almost constant employment level of about 23,500 positions throughout the projection period.

B.3 Public School Librarian Employment

Projections of the demand for school librarians were made by estimating the number of public school librarians separately from non-public school librarians.

TABLE B.4--Projected Enrollment in Higher Education in the United States: 1981-1990 (Thousands)

Year	Projected Enrollment		
	Low Alternative	Intermediate Alternative	High Alternative
1981	11,780	12,442	12,753
1982	11,779	12,620	13,128
1983	11,719	12,513	13,477
1984	11,593	12,351	13,745
1985	11,452	12,174	13,999
1986	11,305	12,120	14,239
1987	11,221	12,093	14,497
1988	11,170	12,098	14,796
1989	11,166	12,139	15,143
1990	11,099	12,101	15,409

SOURCE: [282], p. 39.

TABLE B.5--Projected Employment of College and University Librarians: 1983-1990

Year	Projected Number of Librarians in FTE 1/		
	Low Estimate	Intermediate Estimate	High Estimate
1983	23,200	23,200	23,600
1984	22,700	22,700	23,500
1985	22,500	22,400	23,600
1986	21,700	22,100	23,600
1987	21,100	21,700	23,700
1988	20,600	21,200	23,700
1989	20,100	20,700	23,700
1990	19,900	20,500	23,600

1/ Estimated by King Research, Inc., Library Human Resources Study, 1983.

A model to explain the variations in the number of public school librarians was initially formulated with a number of variables. They were: public school expenditures, number of public school teachers, and public school enrollment. The best fit of various equations to the data was obtained with the following model:

$$\ln (SL_t/SL_{t-1}) = a + b_1 \ln (E_{t-7}/E_{t-8}) - b_2 D72 \qquad (3)$$

The model states that the difference in the natural logarithm of the number of school librarians between the present and the previous year is a function of enrollment changes that took place seven years previously. SL is the number of school librarians and E is public school enrollment. The variable D72 is a dummy variable that compensates for unusual variations in the number of librarians in 1972. The model suggests that the employment of school librarians responds with a very long lag to changes in enrollment: it takes seven years for enrollment changes to affect librarian employment. The size of the coefficient indicates, however, that the resonse is very large when it does occur. The coefficient of b_1 (see below) indicates that a 1 percent change in enrollment growth leads to a more than 1 percent change in school librarian employment.

The ordinary least squares fit of the historical enrollment data (see Table 38) and the librarian employment data (see Table 42) are summarized below.

Parameter	Parameter Estimate	Standard Error	T Ratio
a	0.016367	0.0079	2.07
b_1	1.693985	0.3346	5.06
b_2	- .031709	0.0223	-1.42

The R^2 value for the equation was 0.77, the F-ratio was 13.10, and the Durbin-Watson D statistic was 1.91.

Projections of the demand for public school librarians were made using the National Center for Education Statistics' projections of public school enrollment (Table B.6). The results of the analysis are given in Table B.7. Intermediate projctions were obtained from the equation above. Low and high estimates were made by adjusting the parameter estimates by one standard deviation above and below the mean. The parameter estimates used for each projection series were:1/

Parameter	Low	Intermediate	High
a	.008367	0.106367	.024367
b_1	1.36393	1.693985	2.02393

All of the projected values of Table B.7 show a decline in the number of public school librarians through 1990. The low estimate shows an average annual decline of 1.6 percent per year, the intermediate shows a 1.3 percent decline, and the high shows a 1.1 percent decline. The net loss in number of positions assuming the intermediate projection is 4,700.

How do these declines compare to projections of the number of teachers and to projections of expenditures? The NCES intermediate projections of public school teachers show a growth of only 1.5 percent per year from 1983 to 1990 [282]. Likewise, the NCES intermediate projections of school expenditures for the same period show a 2.5 percent (constant dollar) average annual increase.

1/ The b_2 value was not used in the projection because its value pertains only to 1972.

TABLE B.6--Projections of K through 12 Enrollment in Public and Nonpublic Schools: 1981-1990 (Thousands)

Year	K-12 Enrollment		
	Total	Public	Nonpublic
1981	45,189	40,189	5,000
1982	44,544	39,544	5,000
1983	44,165	39,165	5,000
1984	44,039	39,039	5,000
1985	44,166	39,166	5,000
1986	44,556	39,456	5,100
1987	45,004	39,804	5,200
1988	45,358	40,158	5,200
1989	45,905	40,605	5,300
1990	46,667	41,267	5,400

SOURCE: [282], p. 34

TABLE B.7--Projected Employment of Public and Non-Public Elementary and Secondary School Librarians: 1983-1990

Year	Projected FTE Number of Librarians 1/			
	Public			Non-Public
	Low Estimate	Intermediate Estimate	High Estimate	
1983	51,300	51,500	51,700	13,600
1984	50,800	51,200	51,600	13,600
1985	49,900	50,400	50,900	13,600
1986	48,200	48,500	48,900	13,600
1987	47,200	47,600	48,000	13,600
1988	46,800	47,400	47,900	13,600
1989	46,100	46,800	47,500	13,600
1990	45,900	46,800	47,800	13,600

1/ Estimated by King Research, Inc., Library Human Resources Study, 1983.

B.4 Private School Librarian Employment

Lack of historical data on the number of librarians employed in nonpublic school libraries prevented the development of a formal model to project the future demand for librarians.

The last column in Table 42 shows the results of the Employer Survey of nonpublic school librarians. The change in employment levels from one year to the next during 1978 to 1982 are very erratic, making it difficult to project a trend or to make any other type of projection. In order to use a model of the type constructed for the public school library projections, more data would be required than are available.

Some quantitative evidence is available about the changes in enrollment, teachers, and expenditures for nonpublic schools. Enrollment declined from 1964 through 1976 at an average annual rate of 1.7 percent (Table 38) but is projected to increase at 0.9 percent from 1981 to 1990 (Table B.6). The number of teachers increased at 1.7 percent between 1970 and 1980, and is expected to increase at 1.3 percent through 1990. Expenditures increased at 3.5 percent annually (constant dollars) from 1965 to 1977 (Table 41), and are expected to increase at 2.4 percent annually from 1981 to 1990 [282].

The pattern is mixed insofar as current and projected growth rates are concerned. Five years of data accumulated from the Employer Survey suggest an average annual increase of 6.9 percent in the number of professional librarians. It is believed that that rate is unusual and will not be sustained. Without additional historical data, estimates of the number of nonpublic school librarians to 1990 cannot be estimated accurately. In the interest of conservatism, they were assumed to remain at the same level as in 1982 (13,600 librarians) throughout the projection period.

B.5 Special Librarian Demand

Only five years of data on special librarians were available, and thus only very simple projection methods were appropriate. Variables considered as related to the number of special librarians were time, total number of librarians, number of special libraries, and research and development funding. After reviewing the data, research and development funding (expressed in constant dollars) was selected as the most relevant variable and used to project the number of special librarians. Table B.8 gives the data for research funding over the 1978-1982 period and the 1990 projections developed by the National Science Foundation. Projection results are shown in Table 43.

TABLE B.8--U.S. Research and Development Funding by All Sources: 1978-1982 and 1990

Year	R & D Funds	
	Millions of Current Dollars	Millions of Constant Dollars *
1978 1/	$48,295	$32,192
1979 1/	$54,994	$33,782
1980 1/	$62,222	$35,114
1981 1/	$69,790	$36,052
1982 1/	$77,285	$36,974
1990 (High) 2/	--	$46,674
1990 (Low) 2/	--	$43,488

* 1972 constant dollars calculated from GNP implicit price deflator.
-- Indicates data are not available.

SOURCES: 1/ [315], pp. 24,28
2/ [318], p. 17

APPENDIX C
SUPPLY PROJECTIONS

by Nancy A. Van House

C.1 Projection Methods

Several different methods can be used to project entrants to an occupation. The most basic is simple trend extrapolation: it assumes that past trends will continue and simply extends them into the future. The only data required are time series of the variable to be projected. The advantage to that method is that it requires little data and is relatively simple; its disadvantage is that it assumes that past trends will continue, and is unable to predict changes in trends.

More sophisticated univariate methods look for an underlying pattern or patterns to the data and, where there is more than one, disaggregate them. For example, a simple linear increase over time may be combined with seasonal periodicity. Recent observations are often weighted more heavily than earlier ones. The data requirements for those methods are also relatively simple, requiring only observations on one variable. However, a large number of data points are needed to track the different trends. Those methods also assume a continuation of past trends, although they are able to detect more complex trends. They, too, are unable to predict changes in trends.

More sophisticated projection methods relate the variable in question to other measures. The National Center for Education Statistics regularly projects degrees awarded by field, including Master's degrees in librarianship. Their method is to first project the total number of degrees awarded based on the demographics of the population and past trends in enrollment rates for each age group. They then project degrees in a given field based on past trends in the proportion of total degrees that are in that field. That method is more reliable than univariate methods

because it relates degrees awarded to something more than a simple trend line. When, though, it comes to projecting the proportion of degrees to be awarded in a given subject NCES has to fall back on simple trend extrapolation, with its inability to foresee changes.

Recent research on occupational supply has emphasized the economic decision-making of potential entrants. Supply is expressed as a function of the market in that occupation and in others that may be competing for the same students. The number of graduates in a subject area is thus related to events in the occupation and elsewhere.

C.1.1 The Theory of Occupational Choice

In this model, an individual's choice of an occupation depends on a number of factors. Those include his or her interests, abilities, and perception of the occupation's monetary and non-monetary costs and benefits relative to others. The assumption is that among the potential entrants to any occupation, there are marginal decision-makers whose choice among closely-related occupations is a function of the occupations' relative expected lifetime incomes. That is a measure of income discounted to present value and corrected for the likelihood of unemployment.

Making the assumption relating occupational choice to expected income is not to say that economics is the preeminent factor considered by all potential entrants to an occupation. Rather the implication is that economic well-being is important enough to enough individuals that we can explain changes in occupational supply as a function of the market.

The researcher most closely associated with the approach used here is Richard Freeman [58-66]. Other applications of this method include those by Hansen [71], Allison and Allen [3], Scott [123], and the National Science Foundation [316]. The approach relates graduates in a discipline to the past salaries of graduates in that field and to those in alternative occupations. The assumption is that potential students look at past

salaries as indicators of their own, and choose among related occupations based, among other things, on relative salaries. As we noted above, that does not mean that all individuals base their decisions on salaries, only that in the aggregate the number of graduates is a function of relative salaries.

Forecasting graduates thus requires a forecast of salaries. Salaries, in Freeman's approach, are a function of supply (past graduates) and demand (expenditures in that sector of the economy). An excess of graduates drives salaries down over the next few time periods; an increase in expenditures (all else being equal) increases them.

Freeman and others who have followed that approach have explicitly assumed that the supply of training is unconstrained, that is, that schools adjust the size of educational programs to meet the demands of students. The number of graduates in a field, then, is determined by the potential entrants, not educators.

Freeman has applied his models primarily to fields in which education and occupation are closely related. Those include engineering, business, and accounting. Those disciplines are also, for the most part, ones in which it would be expected that salary is an important factor in student choices. Those occupations are largely in the private sector, salary determination is flexible and changes in supply and demand can be quickly translated into changes in wages.

One of Freeman's major contributions to the economics of occupational choice is his formulation of the cobweb adjustment mechanism. He found that some occupations, such as engineering, oscillate between surplus and shortage. Those markets are overly responsive and tend to overshoot equilibrium. Other occupations are characterized by incomplete adjustment. This means long periods of disequilibrium following a shock to the market.

A major hypothesis of this study is that a Freeman-like model can be used to explain supply in librarianship, where most jobs are in the public sector, where salary determination is fairly rigid, and where entrants are generally considered to be less influenced by economic than by noneconomic concerns. Our contention is that librarians are influenced by salary. Total lifetime benefits from an occupation are both monetary and non-monetary. Non-monetary benefits may be proportionately great in librarianship, inducing people to choose that occupation over others with higher salaries but lesser non-monetary benefits. A reduction in librarian salaries, though, reduces total benefits by reducing their monetary component. A decrease in expected lifetime benefits will make librarianship less attractive relative to other occupations an individual may be considering. Some potential entrants will then choose not to become librarians.

C.1.2 The Library Model and Data Sources

Among a large number of models based on Freeman's that were tested, the best regression for graduates using the available retrospective data was:

$$DLNG = -.049 + 1.133\ DLNA + .363\ DLNSAL14 - .146\ DUMMY$$

$$(2.53) \quad (4.24) \qquad (3.20) \qquad (-4.63)$$

$$\text{Adjusted } R^2 = .78 \qquad F = 26.89 \qquad p > .0001 \qquad DW = 2.0$$

where:

DLNG = change in log of graduates of accredited MLS programs (see Table 5);

DLNA = change in log of recipients of Master's degrees, all fields (see Table 3);

DLNSAL14 = sum of the changes of logs of MLS graduates' real (adjusted for inflation) starting salaries over the four previous years (Table C.1);

DUMMY = a dummy variable for 1958 and 1959, when there were unexplained perturbations in the data.

Graduates of accredited MLS programs and their salaries were used because those are the variables for which data are available over a sufficiently long period of time. The function is in first difference of (natural) logarithms to reduce problems of colinearity and serial correlation. DW is the Durbin-Watson statistic; T-values are in parentheses. The regression covers the years 1956-1978.

The intercept indicates that, other factors being equal, graduates are declining at a rate of 5 percent per year.

Library science Master's degrees are of approximately unitary elasticity with respect to Master's degrees generally: a 1 percent increase in the number of Master's degrees awarded results in a 1 percent increase in MLS degrees.1/ This variable probably presents a general propensity toward graduate education. At times enrollment in graduate programs generally changes, for example, when scholarships and student loans increase or decrease. Library programs are affected along with the others.

The salary variable is, in effect, a moving average of the previous four years' starting salaries: potential students are influenced by salary levels from one to four years before they graduate. That is reasonable. Most MLS programs require one year of fulltime study. Potential students

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1/ The coefficient on DLNA is not significantly different (statistically) from 1.

TABLE C.1--Librarians' Average Starting Salaries in Current and Constant Dollars: 1951-1981

Year	Average Starting Salary	
	Current Dollars 1/	Constant Dollars 2/
1951	$ 3,200	$ 5,585
1952	3,375	5,819
1953	3,600	6,112
1954	3,675	6,156
1955	3,900	6,393
1956	4,190	6,661
1957	4,450	6,846
1958	4,683	7,085
1959	4,862	7,203
1960	5,083	7,399
1961	5,360	7,734
1962	5,661	8,018
1963	5,939	8,295
1964	6,176	8,495
1965	6,467	8,704
1966	6,925	9,017
1967	7,323	9,720
1968	7,714	9,339
1969	8,292	9,564
1970	8,734	9,556
1971	9,013	9,389
1972	9,312	9,312
1973	9,510	8,989
1974	10,062	8,674
1975	10,505	8,259
1976	11,012	8,230
1977	11,130	7,860
1978	12,382	8,141
1979	13,093	8,042
1980	14,170	8,988
1981	15,597	8,792

1/ Average starting salaries were recalculated from the published Library Journal data. The published data are the averages of reporting schools' averages, regardless of the number of graduates; these data are the schools' averages weighted for number of graduated.

2/ 1972 constant dollars calculated from GNP implicit price deflator.

SOURCE: [49-57, 87-93, 143-155].

apply for admission up to a year before they start school, so most will have been making their decision to apply more than two years before they graduate. And many students work while attending school and take more than one year.

The salary determination regression is:

$$DLNSAL = .017 + .481\ DLNDPF23 + .677\ DLNDPF + .194\ DLNLIB1$$

$$(3.22)\quad (8.23)\qquad\qquad (8.07)\qquad\qquad (3.88)$$

$$+ .305\ DLNLIB30 - .276\ DLNG45$$

$$(7.84)\qquad\qquad (-8.63)$$

Adjusted R2=.93 F=41.98 p>.0001 DW=2.4

where:

DLNSAL = change in log of real MLS starting salaries (Table C.1);

DLNDPF = Change in log of median professional women's salaries, deflated (see Table 2);

DLNDPF23 = sum of DLNDPF lagged two and three years;

DLNLIB1 = the change in the log of state and local government expenditures on libraries lagged one year, from the National Income and Product Accounts (Table C.2);

DLNLIB30 = the difference between DLNLIB lagged three years and the current value;

DLNG45 = the sum of the change in the log of graduates four and five years previously.

The regression covers the years 1963-1979.

TABLE C.2--State and Local Government Expenditures on Education and Libraries; Purchases of Goods and Services: 1952-1980
(Millions of Current Dollars)

Year	Expenditures on Education	Expenditures on Libraries
1952	$ 8,265	$23,217
1953	9,267	24,944
1954	10,509	27,827
1955	11,824	30,551
1956	12,953	33,490
1957	14,038	37,122
1958	15,781	41,136
1959	16,423	43,696
1960	18,299	46,548
1961	20,143	50,786
1962	21,716	54,296
1963	24,073	59,030
1964	26,834	64,592
1965	29,848	71,082
1966	34,552	79,833
1967	38,856	89,264
1968	47,728	100,951
1969	47,459	111,191
1970	53,682	124,408
1971	59,596	138,665
1972	65,182	151,421
1973	72,190	168,467
1974	80,446	193,077
1975	91,370	217,184
1976	98,646	232,926
1977	105,635	250,370
1978	114,799	278,326
1979	126,165	306,008
1980	139,703	341,195

SOURCES: [224] AND [225].

Professional women's salaries were included in the regression to normalize librarians' salaries with respect to the general salary level in the economy. Professional women's salaries were used because 85 percent of librarians are women. Other alternative salaries were tried but professional women's had the greatest explanatory power. The coeffiecients of the variables DNLDPF and DLNDPF23 indicate that salaries for librarians are related to those for professional women generally.

Starting salaries have an elasticity with respect to library expenditures of about .2; a 1 percent increase in expenditures on libraries results in a .2 percent increase in beginning salaries a year later. (Presumably the lag is due to the fact that it takes time for an expenditure increase to work its way into the offers being made to new employees.) DLNLIB30 measures the rate of change in library expenditures from three years previously to the current year: the faster expenditures increase, the more salaries will increase. That that variable measures four years' change indicates that a sustained rate of increase in expenditures is required for there to be an effect on salaries. (Given the decline in real starting salaries since 1971, it is perhaps more appropriate to speak of a sustained rate of reduction in expenditures and declines in salaries.)

Not all librarians, of course, are employed by state and local government. A substantial proportion, however, are. Among 1980/81 graduates of accredited MLS programs placed in professional positions of some sort, 86 percent were placed in public, academic, or school libraries, a substantial majority of which would be in the public sector (see Table 25).

The coefficient of the graduates variable, DLNG45, indicates the expected depressing effect of changes in the numbers of graduates on changes in salaries at a later time. The more recent graduates there are, the more the competition for the available jobs. This variable is also a moving average. It measures the rates of change in graduates of four and five years earlier.

Demand as measured by total library employment was expected to be a determinant of salaries but did not enter significantly into the salary regression. That may be because of problems with the retrospective data: no single reliable data series exists on employment of librarians. It may also be that salaries of librarians are not determined by relative supply and demand for librarians but, as the regression results indicate, by the salaries of other workers and by public expenditures, which are determined in turn by a variety of factors. It may be that the reason for the prolonged periods of surplus and shortage that the library labor market has experienced are due to salaries not moving freely to restore equilibrium.

Using the function estimated here to project librarian starting salaries requires projections of state and local government expenditures and professional women's salaries. Three different methods and sets of assumptions were used to project librarians' starting salaries, giving three sets of projections of graduates.

High Alternative Projections

The intermediate alternative first projected the rates of growth of state and local government expenditures on libraries (DLNLIB) and professional women's salaries (DLNDPF), then used the salary regression to project librarian starting salaries based on those values.

The first step was to relate expenditures on libraries to state, local, and federal expenditures on education. That proved to be a complicated function:

$$\begin{array}{l} \text{DLNLIB} = .095 + .785\ \text{DLNED04} - .110\ \text{DLNFED} - .160\ \text{DLNFED34} \\ \qquad\quad (14.17)\ \ (3.49) \qquad\quad (-3.32) \qquad\quad (-4.89) \\ \qquad -.025\ \text{DUMMY} \\ \qquad\quad (-1.34) \end{array}$$

Adjusted R^2=.61 F=8.76 p>.006 DW=2.1

where:

DLNLIB = change in log of state and local government expenditures on libraries from the National Income and Product Accounts (Table C.2);

DLNED04 = difference between the change in log of state and local government purchases of goods and services in education from the current year to four years' previously;

DLNFED = change in log of federal purchases of goods and services in education (Table C.3);

DLNFED34 = the difference between DLNFED lagged three and lagged four years;

DUMMY = a dummy variable for 1970 through 1972, when there were perturbations in the data.

The years included are 1960-1980.

The intercept means that, other factors being equal, library expenditures are increasing at about 10 percent per year. DLNED04 is an acceleration measure. The greater the rate of change in educational expenditures between the current year and four years earlier the greater the expenditures on libraries. DLNFED12 and DLNFED34 are also acceleration measures. Their coefficients indicate that an increase in the rate of change of federal expenditures on education actually decreases spending on libraries. Current library expenditures are more heavily influenced by federal educational expenditures three and four years previously than those one and two years previously. We assume the function is in some measure a complicated one because of the political process.

TABLE C.3--Federal Government Expenditures on Education and Grants in Aid to State and Local Government: 1952-1980
(Millions of Current Dollars)

Year	Federal Expenditures	
	Expenditures Less Transfers Payments	Grants in Aid to State and Local Government
1952	$ 289	$ 199
1953	343	240
1954	376	246
1955	386	251
1956	364	240
1957	437	266
1958	555	326
1959	604	384
1960	622	411
1961	687	446
1962	782	485
1963	902	551
1964	1,046	642
1965	1,331	831
1966	3,360	2,607
1967	3,611	2,762
1968	3,886	3,115
1969	3,835	3,146
1970	4,514	3,665
1971	4,823	3,909
1972	5,361	4,436
1973	4,850	3,926
1974	5,729	4,965
1975	6,504	5,543
1976	5,458	4,545
1977	6,496	5,502
1978	7,104	6,078
1979	8,335	7,268
1980	9,153	7,880

SOURCES: [224] AND [225].

The next step is to project federal and state and local expenditures on education, DLNFED and DLNED. Our projections are based on NCES' projections of current expenditures on elementary and secondary education [282]. The method followed was to compare NCES' data on rates on increase of current expenditures on elementary and secondary education through the 1970's to the National Income and Product Accounts' figures for federal and state and local expenditures on education, and then use those relationships to project the latter based on NCES' intermediate alternative projections of current expenditure rates of increase. The resulting projctions of DLNLIB are in Table C.4, indicating an annual increase in real state and local government expenditures on libraries of about 10 percent per year.

Projecting professional women's salaries was more difficult. Library expenditure projections could be related to NCES' projections of educational expenditures; for salaries, no such related projections were available. For the intermediate alternative, rates of change in professional women's salaries (see Table C.4) were projected by reconciling their past rates of change to those of adjusted average hourly earnings. The two series are not exactly parallel because of compositional shifts in the sample for the former. The resulting projections vary from year to year, but average a .5 percent increase through the 1980's.

Applying the salary regression to the projections of library expenditures and professional women's salaries gives a rate of change for librarian starting salaries that varies from year to year but averages a 11 percent per year increase in constant dollars through the 1980's. Using those salary projections with the regression for the determination of graduates results in an average 5 percent annual increase.

Intermediate Alternative Projections

The intermediate alternative assumes that professional women's salaries and library expenditures will continue their performance of the second half of the 1970's. Library expenditures are assumed to increase at

TABLE C.4--Projected Rates of Change and State and Local Government Expenditures on Libraries and Professional Women's Salaries: 1981-1990

Year	Change in State and Local Government Expenditures on Libraries 1/	Change in Professional Women's Salaries 1/
1981	.076	.000
1982	.083	-.020
1983	.090	.030
1984	.083	.030
1984	.083	-.010
1985	.130	.015
1986	.111	-.020
1987	.104	.020
1988	.102	.005
1989	.101	.005
1990	.097	.010

1/ Estimated by King Research, Inc., Library Human Resources Study, 1983.

four percent per year [194], and professional women's salaries to remain constant, in real terms. The effect on librarian salaries is an average five percent annual increase through 1990. Graduates average a two percent annual increase, declining until 1984 but increasing after that, until by 1990 they would be back up to their late-1960s level.

Low Alternative Projections

The final alternative assumes that librarian salaries remain constant in real terms. This alternative was tested because the observed 3 percent annual decline of the 1970's makes the other sets of assumptions appear optimistic. The result is a continuous and substantial decrease in graduates of five percent per year, with the result that by 1990 graduates are only 65 percent of their 1981 level, or 40 percent of their 1974 peak. Actually, the model makes this alternative unlikely; the reduction in graduates of the 1970's will, according to the model, eventually begin to drive salaries back up. Accordingly, this alternative was dropped from further consideration. It is worth noting, however, that this alternative could come about if librarian salaries are not permitted to move in response to the market. Given that most librarians are in the public sector, a continued poor economy combined with the tax limitation measures of the 1970's could hold down salaries and bring about these projections.

Which set of projections one accepts depends on which set of assumptions one finds the most probable. The analyst cannot foresee the future any better than anyone else; what she or he can do is to project what will happen under certain circumstances if these relationships persist. The accuracy of the forecasts depends on whether those circumstances do indeed come about.