DURING THE PAST DECADE this country has reexamined and revised most of its respected social institutions. Some have been rejected. Cultural and social norms are questioned almost daily in the printed and electronic media. In short, this is an era of stressful change brought on by convulsive waves of shifting values on every front.

Change is not new to libraries, of course, but what is new is the collapsed time-scale of change. In the past change was faced as it happened, but lately social and technological alternatives have occurred at so great a rate that change must be dealt with continuously. The order of change is entirely different from anything which came before. Whether one calls this change revolutionary or evolutionary hardly matters; what counts is the degree to which such change will affect the library’s role in society. As one librarian put it recently, “the trouble with our times is that the future is not what it used to be.”

The social institution called the “library” is in the middle of an onslaught. Tax revolts and rising costs are eroding a traditionally secure financial base. The new media — audiovisuals, television, microfilm and computer-based communications — are in competition with the book. Information is being generated faster than libraries are able to organize and store it. Commercial companies are getting into the information business. Data bases are replacing card catalogs. Communications chan-
nels are distributing information infinitely more widely. In fact, the pace of technological change brought on by developments in computers and communications has increased so rapidly that it is difficult to comprehend, much less measure, the potential impact of such change on library services and operations. One thing is clear, however; the rate of change in libraries is greater today than in most past periods. This means that the institution as it is today will undoubtedly be altered during the coming decade in fundamental ways. While it is not possible to predict exactly what the library of the future may be like, the principal forces of change can be examined and from this an attempt made to discern some trends.

ECONOMIC PRESSURES

One force of change is economics. Libraries are in an inflationary spiral. The rate of increase in library costs generally exceeds the rate of inflation. How long this will continue no one knows. But libraries are being forced to reduce costs, to examine rather closely what they do, and to determine how they can increase their productivity. Raising productivity through automation has, therefore, become an internal library objective. The application of new technology to business and industry has made many librarians feel confident that automation will work in libraries too. In fact, many librarians view automation as the only sensible way to reduce traditionally high labor costs without sacrificing library service.

Savings in library staff and time, through automation, have already been demonstrated. The use of shared computer facilities and the procurement of small, standardized, special-purpose minicomputer systems for well-defined library operations, such as book circulation and the control of serial records, are examples of areas in which this has happened.

The economic pinch is also felt in the area of acquisitions. At one time libraries sought to acquire large independent collections. Today this objective is regarded as financially impractical. The reason is that the so-called "information explosion" has not abated. Information continues to abound in films, microforms, computer tapes, analog tapes and video tapes as well as in books, journals and technical reports. By 1985 some information scientists predict a four- to sevenfold increase in the world's output of information.¹

The long-standing notion that a library can grow to be self-sufficient is no longer held to be valid. In its place is the idea of "networks," wherein libraries form external cooperatives and rely on the new communications technology to help them share resources. Networks imply increased use of the specialized collections of other libraries. Networks also imply a sense
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of responsibility on the part of each member library to serve more than its own constituency.

One of the greatest benefits which the new communications technology brings to libraries is the ability to interconnect them functionally in a more immediate way than ever before. Electronics can do this. In the past, libraries were doorways to internal collections, but communications technology has the power to convert them into windows on the world's knowledge.

As a result, the trend toward a nationwide network of libraries in the United States has never been stronger. Even without a detailed national blueprint to follow, academic, public and special libraries are taking the initiative to link up and interconnect. The concept of a nationwide network of libraries does not mean substituting technology for people; rather, the network would provide, through communications, the directions and facilities for obtaining backup materials and information needed locally which is in other libraries. It would cause libraries to stand not as independent units but as interdependent partners. Implied in this change is the transformation of America's libraries into a single national knowledge resource accessible to all citizens.

TECHNOLOGY — AN AGENT OF CHANGE

The second significant factor that is causing libraries to change is the force of technology itself. In the last twenty years, for example, the spectacular spread of television, electronic computers and communication satellites has revolutionized the communications system in the United States. Man's appetite for new means of communication seems insatiable. And no matter how many new technologies are developed, there is reluctance to let go of the old.

The computer has already made an impact on American libraries. Computers are being used to keep track of book loans, distribute catalog data to remote computer terminals, check in periodicals, order publications, produce book and microfilm catalogs by electronic photocomposition, and even pay bills to library suppliers. Other library applications include provision of automatic bibliographies, spotting and claiming missing issues of serials, and maintenance of directories of data bases in other libraries. There was a time when librarians looked forward to having the library's own computer on the premises, but the computer industry recently made it possible to communicate with a computer from a distance, and this has become the general pattern. Many libraries own or rent computer terminals which are connected to commercial data base services by
telephone lines and these terminals are routinely used to obtain answers to information questions. Small computers, called minicomputers, also enable libraries to own their own computer for a particular library function such as circulation or acquisitions.

In addition to the use of computers, libraries have begun to utilize telecommunications technology. A great variety of telecommunications methods have been used for library-to-library communications and for library-to-home communications. These range from the simplest use of the telephone, to teletype, radio, and cable television, and even to experiments with microwave and satellite telefacsimile transmission. Although the advantages of telecommunications have been known to libraries for many years, utilization has been retarded by problems of cost and systems planning. In the past few years, however, when it became possible to send and receive library computer data over standard telephone lines, interest in telecommunications in general has grown.

Until recently, the idea of tying libraries together through a telecommunications network was considered a costly objective. However, new developments in communications technology, such as fiber optics, packet switching and direct broadcast satellite transmission, portend lower communications costs, certain to stimulate greater use of communications by the nation’s libraries. As these new arteries of communication connect more and more libraries and information centers, the prospect of creating a national network of information resources becomes a tangible telecommunications reality. Studies show that the future telecommunications capacity planned by AT&T and other specialized carriers will be more than adequate to accommodate the traffic projected for interlibrary communications.

Technological developments in the computer and communications industries are certain to continue. There seems to be no limit. Computer manufacturers are already building “intelligent terminals” with greater stand-alone power and memory than their antecedents had. This means, for example, that a computer terminal will be able to accept instructions from a user, perform an information search at a designated time, use limited judgment in contacting other sources or revising the strategy of the search as circumstances dictate, and it is hoped, learn from its past mistakes. In time individuals may have a small information terminal, much like a pocket electronic calculator, which will bring individual information messages on command.

Continuing advances in computer and communications technology therefore are creating a quiet revolution in libraries. It is quiet because


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the signs of change are subtle and not always evident. It is a revolution because the new technology will most surely affect all libraries.

The National Commission on Libraries and Information Science (NCLIS) is the arm of the federal government principally concerned with institutional and technological change in libraries. In its report to the president and the Congress in 1975, NCLIS took notice of technological change and the trend toward development of library networks regionally and nationally. It recommended that the federal government help join the library and information facilities of the country by developing uniform computer standards, providing low-cost communications services, and coordinating state and regional network programs.

A decision in favor of network development, utilizing computers and communications, requires a national plan. National planning is essential for several reasons. First, technology is costly, and a long-range federal commitment is required from the outset to ensure the stability of the program. Second, technology is complex and technical direction at the national level is mandatory if all relevant agencies are to coordinate their activities and orient their programs in a common direction. NCLIS believes that the nation's capability to handle information effectively in the future will, to an important degree, depend on how well and how rapidly coordination and integration of new technological methods and devices into the mainstream of the country's information activities can be made.

To NCLIS, a nationwide network of libraries would encompass state networks, interstate networks and specialized networks in the public and private sectors. The federal government would force no library or information service to join the network, but it would provide inducements, incentives and technical know-how to state governments and to the private sector in order to strengthen the ability of all libraries and information centers to affiliate. NCLIS puts it this way:

If our nation is to achieve the most effective use of national information resources and the largest return for funds invested in them, common goals, objectives, methods and standards are needed now for the coordinated development of information facilities. Unless a coordinated program is established on a nation-wide level, expenditures, facilities, and efforts will be unnecessarily duplicated, and interconnection will become increasingly difficult as local, state and multi-state systems develop without benefit of a common purpose and a common approach.
THE NEW INFORMATION ENVIRONMENT

While the spectacular growth of computer technology and communications technology in the last twenty years has been notable, what is even more striking is the way these technologies are merging and converging with related technologies such as printing and photography. When all these elements are fully integrated, the resultant capability for information transfer and exchange in society will be dramatically different from anything that has gone before. Indeed, some theorists believe that the merging of computers and communications with other technologies will lead to a totally new information environment in the United States that will vitally influence the nation's social, political and economic growth.*

Since libraries are the backbone of the country's information environment today, the more farsighted library commentators expect technological change to usher in a whole new era of library development and service. How information is handled in this country, they say, will determine to a large extent the quality of decisions people make and the character of the lives they lead. Hence, these commentators conclude, librarians have a special responsibility to ensure that technological change is woven into the fabric of society in ways which enable libraries to:

1. broaden and also personalize their information services to the public,
2. strengthen their ability to communicate with other libraries and with users, and
3. increase their internal productivity.

NCLIS believes that the information in libraries and information centers is a national resource intended for the benefit of all citizens. In viewing the future, libraries are seen as the principal information nodes in a national network. This perception attributes more social responsibility to the library than it now has. This means that the library of the future will be more than a place to house physical manifestations of the printed word; it will become the public's main access link to a network of knowledge containing all types of information in all types of formats.

This broadened responsibility does not in any way diminish the value of the printed word, but rather recognizes that today's information comes in many new forms, all of which are the library's responsibility. For example, educational organizations are producing films, slides and filmstrips on every conceivable subject; earth-orbiting satellites are delivering staggering quantities of information about activities on the earth's surface; the broadcast media are generating audio and video cassettes of tens of thousands of television programs for playback; and indexing and
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abstracting firms are developing huge computer data bases in the humanities, sciences and social sciences. There are many more examples.

What has become clear to NCLIS in its work is that the library is only one organizational component among many which make up the total information environment of the United States, and that the mutual interests of all of these participants are intersecting and growing more interdependent every day. These stake-holders consist of the authors and researchers who create information, the publishers who disseminate it, the librarians who guarantee access to it, the documentalists who index it, the microphotographers who compact it, and the archivists who preserve it.

But that is not all. There are also information brokers who repackage information for sale, computer specialists who digitize data bases, and communicators who transmit or broadcast information in all media. There are the network specialists who connect information files, centers and systems to prospective users, and the information scientists who design information systems and perform research to extend the frontiers of knowledge in the field.

Thirty or forty years ago America's information environment was manageable. The volume of information was moderate and restricted largely to print, the number of organizations engaged in the process was small, and computer, communications and micrographic technologies had not yet made their debut. Today the opposite is true. The U.S. information environment is cluttered and fragmented. It serves specific constituencies, not the public as a whole. It is heavily dependent on computers. If information is indeed to be considered a national resource, then the time has come for libraries and their information counterparts to work together toward a national program that will use technology and other means to make the total knowledge resources of the country equally accessible to all people. How to begin this new movement, and the delineation of state and federal responsibilities in it, is the underlying aim of the forthcoming White House Conference on Libraries and Information Science.

The conclusion to this essay can be briefly summarized. It is inevitable that libraries will continue to be affected by technological change and that in the process, they will develop into a broader-based information institution than they are today. Although the precise shape of the future is obscure there are several bases for at least rough and partial prediction. The first is that economic pressures, technology and the new information environment will not only persist but will also grow. While some tradi-
tional local library practices and customs may survive these pressures, this will not stop libraries from affiliating with networks, striving toward national interconnection, and accepting broader information responsibilities. The second is that more libraries will automate their operations. The library profession now has a decade or more of automation experience behind it, and the trend toward national bibliographic control and associated computer operations is unmistakable. The third basis is that libraries will become principal access points for information and learning in the nation. As yet the United States has not formulated a national information policy. As the government sharpens its focus on the new information environment, however, it is likely that libraries will be designated to play a more active informational and educational role.

While there is great cause for optimism, the painful problems that lie ahead cannot be ignored. Technology alone cannot do the job; it will also require expert social engineering. This is a pluralistic society. Most libraries and information centers in the United States serve local jurisdictions. It will take leadership, imagination and public support for these decentralized units to unite in the national interest. This is the challenge facing the White House conference in November 1979. It is here that the crucial first steps will be taken.

References


6. Ibid., p. ix.

ACRONYMS

ALA — American Library Association
AT&T — American Telephone & Telegraph
CB — Citizen's Band
CIA — Central Intelligence Agency
CLOUT — Concerned Librarians Opposing Unprofessional Trends
COM — Computer Output Microform
FCC — Federal Communications Commission
GI — Government Issue
IAC — Information Analysis Center
ISBN — International Standard Book Number
MBO — Management by Objectives
MLS — Masters degree of Library Science
NAL — National Agricultural Library
NCLIS — National Commission on Libraries and Information Science
NEA — National Education Association
NIH — National Institute of Health
NLM — National Library of Medicine
PPBS — Planning-Programming-Budgeting System
RLG — Research Libraries Group
SDI — Selective Dissemination of Information
SSIE — Smithsonian Science Information Exchange