TECHNICAL AND READER SERVICES FOR THE
RESEARCH LIBRARY†

—The Challenge in the Next Decade—

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Abstract

The central theme of this paper is the impact of changing research methodology and new modes of scholarly communication on the needs and the opportunities of the research library today, and thereby the new demands and new programs for technical and reader services to better serve the scholar-researcher. It seeks to review and analyze the basic role the research library and the tools it employs to accomplish its goals; how technical and reader services have been organized to provide access to the resources it holds; and how such services change and develop to meet new challenges and offer new solutions.

Specifically, this paper will discuss how technology and research trends mutually affect one another—new technology makes more new information available, which suggests new research possibilities, and new research interest stimulates the development of new technology to meet this new need. A case in point might be the direct consequence of computer capability in textual analysis, which makes an heretofore Herculean task routine research. Similarly, the current interest in quantitative analysis


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encourages the creation of computer-based databases. The scope of the research library today (and tomorrow) is no longer confined to collections of books and journals and finding lists and catalogs, but includes multi-media resources and mixed format publications which must be housed, organized and serviced with new skills and different facilities. The cataloger must learn to handle videodisks, tapes and databases, and the reference librarian needs to master electronic literature searching and interactive computer technology.

Present day scholarly interests further expand the scope of a research library collection, and the interdisciplinary nature of many research programs often requires new configurations of services and skills. The traditional resources and programs are not obsolete, and new tools and new facilities do not actually replace the old. The process is one of growth, in complexity as well as in scope, and the challenge remains a vigilant adjustment without losing sight of the goal.

An occasion like this offers us an opportunity to get together and get acquainted, to compare our varied experiences in the past, and to share our common visions for the future. This, then, is the theme of our Seminar, Library Cooperation and the Development of Library and Information Services. I have chosen to talk about the research library, more specifically, the technical and reader services for the research library, partly because these relate more directly to my own professional experiences, and partly because these are the areas more visibly affected by new technology—the impact of which forms a major theme of this Seminar. I should hasten to add, however, that of course technology affects all aspects of library activities. On the other hand, technology is not the only factor of change, albeit often it is more readily felt, if not more inherently important. Moreover, all ingredients for change react and impact one another, so in the end it becomes very difficult and perhaps futile to try to sort out which is the cause and which is the consequence of the multifaceted change we face today. What seems to be clear is that we
are going through a period of rapid change, and the future is full of excitement and also full of uncertainties. The research library today faces a host of old problems and new challenges.

But first, perhaps, we should define what is a research library. As I review the literature on the subject, I find more often than not a practice of equating the research library with the academic library, particularly a university library. This is probably true most of the time. At least most university libraries are, or are supposed to be, research libraries. However, the reverse is not necessarily the case. A research library does not have to be a university library, and some of the most important research libraries are not attached to any academic institutions. In the United States, for instance, membership in the Association of Research Libraries is predominantly academic, but the New York Public Library and the Boston Public Library are two notable exceptions. And of course, the is the national research library, the Library of Congress. Therefore, we say a research library is not defined by its affiliation, but by the role it plays. To simplify a little, we can say a research library serves research purposes. And traditionally, it is characterized by its collections, which are assembled and organized for research purposes. Granted, a preponderant portion of such collections are indeed scholarly in nature, but again this does not necessarily have to be the case. It is rather the purpose and the pattern of use which define it. Many a distinguished research collection contains materials which by themselves would ordinarily be described as ephemeral, trivial, or perhaps just plain second rate, and yet when "properly collected" in the right context these become the very ingredients which make a research collection. We all know that any ordinary college or public library should and would have collected the works of major writers, but only the select research libraries would have also collected the works of minor writers. And sometimes a substantial collection of minor writings, as a discreet collection by itself, may be the very important special resource for scholarly research. Witness the academic interest in
19th century American dime novels, or 20th century theatre playbills, or the growing and perennial favorite, children's books of all ages and types. The essence and the process of research call for both comprehensiveness and specialization, in other words, both breadth and depth in a given field. For research purposes, the search for knowledge and insight is not, and should not be, limited by language, format, authorship or the intended readership. (Sometimes I call this the non-discriminatory prerequisite in research; somewhat equivalent to the clause of "without regard to color, race, religion or country of origin" in contemporary social legislation.)

The research library is thus defined and guided by its collections, collections distinguished by their breadth and depth of coverage. The size of its collections has traditionally played a major role in the ranking of the library among its peers. Growth is therefore a factor as inevitable as it is indispensable. And herein lies the cause of some of the problems we face today, not the least of which is the questioning of the very concept of the primacy of collection development for the research library.

It is perhaps trite to reiterate the exponential nature of the so-called information explosion, but the indisputable fact is that more and more are "published" in an ever growing variety of formats. The research library, with its traditional mandate of comprehensiveness and specialization, is fighting a seemingly losing battle, or pursuing an impossible dream. The sheer bulk of the size of its collection has created a space crunch which threatens the viability of its existence, and myriad innovations sought for or imposed upon it have caused fundamental changes in library functions that greatly disrupt, if not disturb, the established practices of a traditional profession. Technology, or automation in particular, is but one wave, albeit a giant wave, in the changing sea.

First I should like to say a few words about the basic challenge that the research library today is not or cannot remain collection-based. This is the current "collection versus access"
argument. As a former reference librarian, I believe in access and indeed am rather passionately committed to it. But perhaps also as a former collection development librarian, I cannot visualize a great library without great collections. Access is a mere process, and it must have something to access to. Perfection in the process or proliferation in access points does not guarantee satisfaction in meeting research needs. Somebody, somewhere, has to assemble the collection first before any access can be meaningfully applied.

The advocates for Access as the central role of the research library have of course some seemingly valid reasons for their position, and I fully appreciate their motives. In the first place, as I indicated earlier, the relentless growth of research library collections has indeed put many in an untenable position: it simply cannot go on forever at this accelerating speed, lest the library should fall on its own bulk and weight. If one assumes that the culprit is the collections, or at any rate, the growth of the collections, then it may seem plausible that the solution lies in the elimination of this cause, namely, the collections. Coupled with the dazzling promises of technology today, to provide heretofore unheard of access possibilities, it is but natural to want to think that the solution lies in the redefinition of the role and purpose of the research library. If we can no longer meet the needs of the traditional research library, perhaps we should pause and ask whether the traditional research library needs to continue to exist. I submit this is an understandable approach, and a very tempting one too, especially as sometimes it is the right approach. However, in this particular case, I am very much on the side of tradition. I do not think the essence of the research library can be substituted by access, however miraculously efficient. The problem I think lies partially in the confusion of ‘information’ with ‘knowledge’. Or, to quote Oscar Handlin, American historian and Director Emeritus of the Harvard University Library, “information is essentially a large but inert body of material, for which the terminology warehousing is entirely appropriate.
Neither the vocabulary nor the underlying concepts of warehousing, however, can apply to research collections, since the research process is so fundamentally different from information gathering."1 Much of the talk about access these days refers to information access, which is important, but not research. Many of those who advocate the change from collection to access as the central role of the research library also advocate the change of the name library to information center. It is a basic difference in the very understanding of the role and the process of research. Should one not ask, with T.S. Eliot, "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?"2

Another aspect of the research library also warrants some comments. It is tradition bound and mindful of the past, but its collections are very much future-oriented. To quote Professor Handlin again, "Building collections to satisfy current demand is building them too late, and librarians must instead anticipate the research interests of twenty years hence."3 Collection development, in other words, calls for knowledge and foresight. The research library is not a mere repository of past records, nor is it a mere gathering of inert data. It is a dynamic collection of the cumulated records of our intellectual heritage so assembled and organized to serve the research needs of today and tomorrow. Such then are the parameters within which the technical and reader services of the research library perform their functions.

The research library today faces a number of concerns, some of which are in fact quite similar to those noted by our predecessors some fifty or sixty years ago. An ALA study in the 1920's, entitled College and University Library Problems, enumerated these by now very familiar concerns: the impact of research and pedagogical methodology on library collections; the need to meet growing demands with limited and indeed diminishing resources; the call for cooperation and resource-sharing among research libraries; and the lament over insufficient training and inadequate status of research library staff.4 In
subsequent years, similar or related questions were raised again and again: 1951, a symposium at the University of Pennsylvania cited “patterns of research and changing library needs” and “the ever expanding demand for materials and the threatened decline of support”\(^5\); 1955, the Association of Research Libraries convened a conference to discuss the problems and prospects of the research library, and noted the “consequences of growth” and the ensuing frustration of “financial squeeze”\(^6\); 1967, in its report on the research libraries, the American Council of Learned Societies too cited the “problems” facing the research libraries—“shortages of space, staff and funds” as “consequences of the double challenge of the greatly increased demand for their services and an unprecedented increase in publications at home and abroad.”\(^7\) Soon, however, new concerns were added to the old ones. In addition to the perennial problems of the exponential growth of publications and the inescapable fiscal reality of limited funding support, the library now has to cope with some new challenges, the more important of these are the all pervasive impact of technology and the urgent need for preservation. These too are not new concerns discovered only yesterday. The aforementioned report by the American Council of Learned Societies recognized the issue of automation as “at once a problem and a promise”, and cited the importance of durable paper for preservation. Library literature, in the years following, abounded in references to automation and preservation, to the extent that in recent years these two topics seem to have taken precedence over other issues, including the basic question of the raison d’être of the research library.

I have thus far discussed the issues in very general terms, and primarily from an administrative point of view. How do they apply in technical and reader services? The research library, being collection-based (at least this I trust is still the case today) is, by and large, bibliographically oriented. This means that its technical services are primarily bibliographically oriented, and so are its reader services. At least this is true with Harvard. I recall
that the first instruction I received when I began working as a reference librarian at Harvard's Widener Library more than 30 years ago was "Harvard does not believe in spoon-feeding". Translated, it means that the Harvard reference librarian is not supposed to "do the work" for the student who is expected to learn to be self-reliant. This goes hand in hand with the tradition of open stacks and the acclaimed virtue of browsing. Detractors, however, sometimes view this "restraint" on the part of reference librarians as a sad reflection of the lack of scholarly interest, or ability in the librarians, and sometimes thus unfavorably compare the American librarians with their European counterparts, who often are trained and function as research scholars themselves. Of course some of us may dispute this. Moreover, American libraries are justly proud of their user-oriented philosophy of service. The fact remains that for the research library, the traditional emphasis has been on the collections rather than services. Witness the statistical emphasis on holdings rather than services in ARL surveys, but there is recently some talk of reordering the priorities. This of course would be necessary if access rather than collections should become the central role of the research library, in which case its technical and reader services will see some dramatic changes. But regardless, the research library in the immediate years to come will see many changes in its long established practices, if not policies.

Doubtless, technology is the prime mover behind many of these changes. For the research library (and probably for other types of libraries as well) LC Marc and the computer-based bibliographic database have made shared-cataloging a necessity as well as reality. Cataloging as an institution-independent activity has rapidly ceased to exist. The organizational structure and the staffing pattern of many a catalog department in libraries across the land must make the necessary adjustments. This has already taken place. Libraries, large or small, these days catalog via some network or utilities. Many have progressed beyond; automation has reached circulation and acquisitions as well. Indeed, in a sort
of reverse logic, automation in certain library activities has actually started in smaller libraries first, partly because its very limitation in size might be conducive to pilot experimentation, but sometimes, alas, because the smaller libraries lacked the necessary expertise to detect pitfalls.

Reference and literature searching have also seen many changes under the impact of computer technology. Beginning with the science and technology-oriented indices and guides, the field soon expanded to touch other disciplines. The National Library of Medicine computerized the production of Index Medicus in the mid-1960's, a pioneering enterprise. Today there are more than 2,000 readily available databases. I said "readily available", because probably there are quite a number of others which already exist but are not yet "readily available". Libraries subscribe to Dialog and BRS, and a host of other services. At Harvard, on the whole not yet a particularly aggressive electronic database user among its many libraries, the librarians regularly conduct searches on diverse databases, from ADTRAK to Water Resources Abstracts, from A-V Online to Zoological Record, from Art Index to Westlaw, and from Abstracts of Working Papers in Economics to Toxicology Online.

Indeed no longer are electronic databases the exclusive preserves of medicine, law, business or the physical sciences. Quantitative research has become quite the vogue in social sciences inquiry, and textual analysis has found new vitality in the humanities. Technology has much to do with this new phenomenon, but not exclusively so. What has happened, and it is still happening, may be described as a sort of combustion induced by the interaction between technology and research methodology. Computer technology not only can increase the speed and efficiency of the old method, but has introduced new methods heretofore deemed impossible for human undertaking. The power of successive generations of mainframe computers is indeed awesome just to contemplate, and the increasing capabilities of the mini and microcomputers, not to mention the
desktop PC, have quite exceeded the fond dreams of only a
decade or two ago. The excitement spills over. Today we may
find classicists and literary critics hovering over their personal
computers and testing the softwares designed to explore the
sources of late Roman poetry, or to compare the narrative styles
of a Sir Walter Scott or Victor Hugo.

Contemporary research, particularly in the social sciences,
and perhaps predominantly in the United States, has become
increasingly quantitative in nature and approach. There are many
different reasons for it. There is, first of all, that all-pervasive trust
in numbers, an outgrowth of certain preoccupation with “scientific
objectivity”. Then there is the heightened interest, both social
and academic, in behavioral studies of people in such contem-
porary themes as voting habits, market analysis, or new implica-
tions or applications of vital statistics, such as birth and death and
marriages and divorces. The incentive is part social action and
part academic fashion. The net result is the increasing popularity
of quantitative databases. And the computer arrives just in time.
Perhaps it can also be said that the availability of the computer
as the high-tech research tool has undoubtedly helped encourage
this heightened interest in quantitative research. Furthermore,
this heightened interest on the part of the academic researcher
and social planners in turn encourages and stimulates the develop-
ment of new technology to meet this new need. The spiral of
research needs and technology innovation ascends continuously.
Research interests and needs affect and in turn are affected by
 technological advances. New technology makes new information
available, which creates new research possibilities, and new re-
search activities demand new tools which new technology is
couraged to provide.

In 1984, the Association of Research Libraries conducted
a study and discussion among its members, seeking to forecast,
or at least suggest, the likely models of the research libraries in
the 1990’s. It proposed four “options”, ranging from the
“traditional” library with its emphasis on physical and biblio-
graphic access to published resources, to the still collection-based but access-promoted library which "provides newer technologically-based services as a supplement to traditional library activities"; to the "sophisticated discipline-oriented information services modeled after the medical field where national and regional services provide the infrastructure for local agencies to provide timely, user-tailored information support", and finally to the "highly automated Academic Information Center", —mission of which is "ready access to information regardless of type, source, location, or format". The ensuing discussions on these 'options' did not give much consensus among the ARL member libraries, except perhaps the predictable one of a general acceptance of an increasing role of technology and varying degrees of confidence and concern for the future.

Technology is here to stay, and the most conservative institution, as well as the most innovative or the most experimental, will be much affected and thus perforce must adjust and make changes, by choice or by necessity. The research library is no exception.

What are the issues involved? Why? And how do we resolve them?

The challenge of the next decade is not a "paperless library" or the "electronic information center". The challenge is to maintain, nurture and optimize the resources of the research library with the help of new technology. The resources of the research library today and tomorrow will no longer be confined to collections of printed books, journals, documents and manuscripts, but will also include multi-media source materials and mixed format publications. Reference and bibliographical work can no longer be limited to searches in catalogs and finding lists, but also must include databases and interactive tapes and disks. This means the library must be prepared to acquire, process and service these additional resources. Note I repeatedly use the word "also", because I do not see the future as an either/or situation. Instead, the new shall be an add-on to the old. This
of course has always been true, even under the most revolutionary circumstances. Such is the base for continuity and stability; but herein also lies much uncertainty, even anxiety. Exaggerated promise or fear of the total take over by electronic technology does not advance the contribution of the library, for it will surely lead to neglect of the old and leave the library ill-prepared to cope with the new. Add-on's can be vexing, because incremental changes sometimes appear to be more troublesome than drastic alteration!

For the research library then, technical services will continue to keep somewhat its traditional bibliographic orientation, but with more and more dependence on electronic technology to improve efficiency and to facilitate cooperation. Access will be promoted, and it will be more and more technically feasible and politically salable. Budget constraints and space crunch will undoubtedly put further pressure on collection building. Access alone cannot provide the answer. Resource sharing is a noble concept that has always been with us, but perhaps its time is coming. Access is a means for sharing, and the libraries must all have adequate bibliographic tools to make it possible. Thus the basic task of cataloging remains indispensable.

The high and increasing cost of cataloging has been called to question. Professional pride and the conviction that the maintenance of "standards" cannot be compromised, lest this indispensable tool be rendered useless, have deterred efforts for change. The consequence is yet to be seen. As more and more large research libraries find it difficult and costly to contribute to the national database cataloging records of their uncommon holdings, more and more libraries find themselves forced to resort to "short cuts" and create "non-standard" records for local use, and simply by-pass the cooperative national database. Thus, the very goal of cooperation and sharing might be jeopardized by the good intentions of maintaining standards to facilitate cooperation and sharing.

For many research libraries, computer technology came to
technical services first. This, I think, is partly a reflection of the fact that research libraries to date have been primarily bibliographically oriented. But reader services have not been left behind for long. Circulation, inter-library loans, and reference and literature searching have been extensively automated in many libraries. Except for circulation, which in general must be bibliographically-based and thus needs to be closely coordinated with the catalog record when automated, some of the other reader services such as inter-library loans and information retrieval searches can be automated independent of the state of automation in the rest of the library. The pressure, or the temptation, or the opportunity, to introduce computer-assisted reader services is therefore present and easily felt. And the library certainly can add these new services incrementally, database by database, if it should so choose, that is, budget permitting. The issue here, one finds, is not so much whether electronic databases will replace traditional print reference tools, for some of them already have. And many of them were never available in any other format. The question that troubles the library is who should assume the cost. Librarians believe in access, and many if not all believe in free access. Computer and telecommunication costs are not only high, but rather difficult to control with a fixed budget. The practice of charging fees for such service rendered is perhaps a necessary but nonetheless “unhappy” solution, for it is something which runs against the grain of the cherished philosophy of free access. This is an “add-on” that is welcome as a service, but the necessity to charge fees remains troublesome to the service-oriented.

Technology promises not only electronically based guides and indices, but electronically delivered documents and texts as well as content analysis. Indeed, much has already materialized in certain fields, such as law, medicine and business—the professions which can better support these services financially. As developments in this area will mainly be commercially based and profit driven, the degree of automation will vary considerably
from discipline to discipline. Some less "profitable" fields will lag behind and continue to depend on "traditional" sources of reference. Reader services in the research library will therefore remain a "mixed" service, providing the needed tools and assistance in whatever format available. The 21st century "Renaissance" research librarian will need to be adept at interpreting both erudite 19th century scholarly annotations and the state-of-the-art marvels of the CD-Rom or interactive video disk.

The challenge for the research library in the decade to come is multi-faceted. On the one hand, there is the well acknowledged fact of "information explosion" which at once opens up vistas but also challenges the established process of scholarly communication and indeed may threaten the very fabric of traditional library operations. The building and management of the traditional base of the research library, the collections, have encountered near insurmountable obstacles, so much so that some today question the rationale for the research library to remain collection-based. Furthermore, the social/cultural imperatives of the day have noticeably shifted contemporary research interests and significantly affected methodology. Study has become increasingly inter-disciplinary, and scholarly communication needs to be, and is, less and less confined by national or regional boundaries. The research library by the end of our century must in some degree be international in its outlook and multi-disciplinary in its approach. These will have direct and profound implications on the organization and the staffing of the technical and reader services of the library, both of which require professional expertise in the old and the established, as well as the new and yet-to-be tested skills. Moreover, it has been suggested that the research library may evolve into "a series of sophisticated discipline-oriented information services", in which case perhaps the "traditional functions of acquiring and cataloging published literature" might be "achieved through commercial and network services" while the staff would consist mainly of subject specialists to provide "personalized and intense" reader services. This is
Option 3 of the aforementioned ARL study and projection in 1984. It is not as “revolutionary” as Option 4, with its vision of the “highly automated Academic Information Center” where “the production, dissemination, and use of scholarly and administrative information are centralized” in a “brave new world” fashion. Yet, Option 3, if adopted, will certainly entail fundamental changes in both the structure and the direction of the research library. The shift will be towards access, and its “success” will depend greatly upon a viable national or international program of collection/information gathering and resource sharing.

Much then depends on both political and technological feasibilities. The 1984 ARL study suggests that Option 2, which envisions the research library continuing with its traditional functions, which would be greatly enhanced by new technology, as the most likely model in the next decade. This, it was explained, is the case because “many libraries are going in this direction. It is foreseeable, and reasonable. It is a logical extension of where we are today.” Just the same, this raises another important question which requires serious consideration.

This is the question of funding. Incremental change or revolutionary restructuring both require financial support. The former, being relatively gradual and non-dramatic, if not unexpensive, is sometimes less noticeable and often can be “absorbed” without having to re-set priorities. But this is dangerously deceptive and misleading. Many a naive university administrator, as well as inexperienced librarian, had earlier miscalculated the true cost of automation. Ronald L. Orcutt, Associate Director of Harvard University Office for Information Technology, reminded us that universities are “uniquely vulnerable to miscalculations”. He cited, among others, the tendency to overspend on hardware purchases leaving none for software and technical support services. Indeed, he described “overspending for equipment and the resultant unanticipated increase in future costs for support, maintenance, and future development” as “symptomatic of an immature approach to the effective management of informa-
tion technology.\textsuperscript{12} He warned us against pinning our hopes on the trend of steady decline in unit cost, as it often exacerbates the funding problem by increasing the rate of demand to the point that it counteracts unit-cost reductions. And he further cautioned us that "vendor grants and joint-study projects are the single biggest threat to a university seeking to restrict diversion of resources to technology." The crux of the matter is that the financial commitment for technology has increased steadily and dramatically. Mr. Orcutt estimated that, at Harvard, the cost of information technology will increase by 25% each year.\textsuperscript{13} It will not be dramatically different for the library. What are the funding possibilities? New outside money? Re-ordering of priorities within the university? Re-ordering of priorities within the library? This is the basic task to be tackled, regardless of whether the changes be incremental or revolutionary.

Librarians, \textit{despite} or \textit{because} of being a "conservative" profession, have long appreciated and cherished the importance of vision. Librarians are ever mindful and fascinated by the future, because they are aware of the past. Hopefully or fearfully, we await the dawning of the paperless society. The future may not be here yet, but it is coming. Paperless society may never materialize—a relief rather than disappointment to most of us, but automation technology can be ignored only at our own risk for survival. Earlier this spring, when a senior professor of the History Department at Harvard requested not only a copy of the facsimile edition of the \textit{Great Domesday Book}, which first appeared in the year 1086, but also a copy of the database prepared by two researchers at the University of California, Santa Barbara, in 1986, I knew the Electronic Age had arrived!

But lest we conjure up too vividly a world of online retrieval and interactive video imaging, I should like to cite two "visions" which appeared in two recent articles in \textit{Information Technology Newsletter}, an in-house publication of the Office for Information Technology at Harvard University. The first one was by John Simon, editor of the \textit{Newsletter}. In the article he described, in
some detail and with much enthusiasm, the many automation
innovations at Harvard libraries, and then summed up with the
following:

Libraries are no longer the animals that they were. If they were
mules, now they are horses. If they were owls, now they are
eagles. Their response to the information explosion is faster and
their field of vision broader. Those who haven't visited a major
library recently should do so.¹⁴

Then he added in conclusion:

But though many are capable of conducting much of their
business at the speed of light, though they are wont to deal
with vast stores of virtual information whose very existence is
ephemeral as an electric current, and though, through the agency
of international telecommunications, they have been put veri-
ably in touch with the world, one should not take leave of this
discourse with the impression that the libraries have evolved from
the cloistered rooms of the medieval friaries to the user rooms
of the computing centers of the 1970's, all terminals and a
handful of dogeared reference manuals in disarray on a table
or stuffed into wall-mounted wire racks.

Notwithstanding the growth of full text database, the sources
cited in the neatly composed bibliographies output by on-line
search services are still predominantly printed documents. Be-
hind, or to the side of, or above or below every circulation
desk, and likewise for reference desks, one will continue for
sometime to find books— stacks upon stacks of them. Nor
is there any near-term prospect for putting on-line the wealth of
materials published prior to the age of machine-readable com-
position. Neither should we expect libraries to rush to put a
terminal on every table. Those who long for the quiet alcove,
the heft of a book, and the feel of its pages will continue to be
accommodated throughout their lifetimes, and it is not unlikely
that their children, too, will know books. If we allow that
libraries have become horses from mules or eagles from owls,
we should not lose sight, in crediting their speed or loft, of the
The other "vision" is that of Stephen C. Hall, Director of the Office for Information Technology. Concluding his "Thoughts on Emerging Technology", he wrote:

I expect that people will continue to read books by the fire; but coming, perhaps, to an obscure reference, rather than noting, mentally or on a convenient scrap of paper, the intention to look it up, they might push a button on the arm of their chair or to pick up a sleek plastic device, connect with a remote database through a university or national network, and, in the next moment, using multiple media, peruse the course of the citation to the crackling of the logs in the fireplace.

I should like to think that perhaps the reader was reading Su Tong P’u or Hong Lou Meng.

REFERENCES


15. *Ibid*.