

SCHOLARS AND RESEARCH LIBRARIES IN THE 21st CENTURY



American Council of Learned Societies
New York, N.Y. April 27, 1990

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The Annual Meeting of the American Council of Learned Societies affords an opportunity for scholars and teachers of the humanities and social sciences in the 51 disciplines and sub-disciplines represented by the Council's constituent societies to engage in formal and informal conversation on topics of broad common interest. The principal formal session of the 1990 Annual Meeting was a panel discussion on the subject of "Scholars and Research Libraries in the 21st Century."

The Council invited five speakers to reflect upon the relationship between scholars and their most essential intellectual resource: the research library. Speakers were invited to conceive the topic broadly and to approach it from whatever perspective seemed most appropriate to them. The stimulating panel that the Council was able to assemble included Patricia Battin, President of the Commission on Preservation and Access; Billy E. Frye, Vice President for Academic Affairs and Provost at Emory University; D. Kaye Gapen, Dean of the General Library System at the University of Wisconsin, Madison; Richard A. Lanham, Professor of English at the University of California, Los Angeles; and A. Richard Turner, Professor of Fine Arts at New York University and Director of the New York Institute for the Humanities. The presentations were both thoughtful and provocative. They prompted equally challenging questions and responses from the audience.

This panel discussion was part of a larger effort that ACLS has been making to address the general problem of scholarly resources over the last several years. It followed upon the completion of the work of the Research Library Committee, established by the Council on Library Resources and co-sponsored by ACLS, the Association of American Universities, and the Social Science Research Council. That Committee, which included university presidents, senior academic officers, faculty members, librarians, and archivists, met five times during 1988 and 1989 in an effort to explore the future form and substance of the academic research library. The Committee placed particular emphasis on the needs and expectations of faculty members in the humanities and social sciences. The "Statement from the Research Library Committee," which was distributed to those attending the ACLS Annual Meeting and later published by the Council on Library Resources, is included here along with the presentations of the five speakers. A fuller version of the Committee's report will soon be available from the Council on Library Resources.

The ACLS plans additional activities on the subject of libraries and scholarship over the next several years. They will be reported in the ACLS Newsletter and in subsequent Occasional Papers. In the meantime, the Council wishes to record its gratitude to the Council on Library Resources for sponsoring the Research Library Committee and to the five speakers at the Annual Meeting whose talks are reproduced in this publication.

Table of Contents

Statement from the Research Library Committee	1
The Future of the Library: A View from the Provost's Office <i>Billy E. Frye</i>	9
The Needs of Scholars: Libraries in Transformation <i>D. Kaye Gapen</i>	15
Access to Scholarly Materials <i>Patricia Battin</i>	21
Lights Are On, Will Anybody Be Home? <i>A. Richard Turner</i>	27
Electronics Texts and University Structures <i>Richard A. Lanham</i>	31

Statement from the Research Library Committee

The Challenge to Research Libraries

Higher education is in a period of questioning, reflection, and change. While the importance of universities is widely understood and their work endorsed, they are, nevertheless, now more than ever before in competition for financial support with other, equally essential, public enterprises. The audience universities serve is increasingly diverse and brings additional requirements, more attention to teaching is being strongly urged, and the pertinence of what is taught is being scrutinized carefully because there is persistent concern about the purpose and results of undergraduate education. Further, the dependence of teaching and research on computer and related technologies has grown rapidly and has added a new level of structural complexity to continuing operations. Staffing problems loom large, and it is assumed many universities will have to take heroic measures during the next decade to cope with anticipated faculty retirements, especially in humanistic and historical disciplines.

Each of these forces has economic implications, and because financial resources will continue to be limited, the years ahead will require refinement of purpose and invention in method. Choices will have to be made and new ways of accomplishing university objectives will have to be found.

What is true for universities is true for their libraries, where obligations to the past, present, and future have converged with great force. Large portions of accumulated collections are physically fragile; current publication volume is expanding worldwide, and expectations of users are honed by what they now see as technically possible. More fundamentally, it is not clear that the research library of today can be a paradigm for the 21st century library. The rise of new fields of inquiry and the shifting organization of knowledge into new configurations present a demanding challenge for libraries, which conduct their collecting and bibliographic work on an historically established base. Further, uncertainty about organization and operations is implicit in a future where

the extent and influence of innovation in telecommunications and electronic publishing are essentially unknown.

The form of future library service will be shaped by how well librarians cope with the sheer quantity of published material, the growing number of print and nonprint formats used to store information of interest, escalating requirements of users for access to everything of importance, new and rising costs, and the structural changes in the system of scholarly communication brought on by the interrelated technologies that are transforming how information is stored, organized, processed, and transmitted.

Fortunately, librarians have a strong record of accomplishment. They have cooperatively developed computerized bibliographic systems that identify and locate millions of publications. They have pioneered in the application to library operations and services of an ever-increasing array of information technologies. Most important, they have demonstrated that they can join forces to attack, on a national level, such intractable problems as preservation.

The years ahead will be demanding ones, but the foundation on which to build is largely in place. The members of the Research Library Committee recognize the difficulties libraries face, but also see an exceptional opportunity to make constructive change and assure for academic research libraries, individually and collectively, their unique, educationally important role into the 21st century.

The Central Issues for Research Libraries

For libraries to succeed in a much-changed setting, the policies and priorities of each university relating to library resources and services need to be explored fully and set. Of equal importance, the capabilities required to follow those policies need to be identified and provided.

Many issues requiring attention were identified by RLC members. These examples suggest the range of pertinent policy questions.

- How can the university determine and maintain a proper balance in library support of the various scholarly disciplines that may require different services?

- What are realistic expectations for, and limits to, interinstitutional cooperation in such areas as developing complementary collections, lending materials, sharing storage space, and preserving historical collections?
- How can librarians and scholars, working in close collaboration institutionally and nationally, promote the development of additional specialized collections and the penetrating bibliographic analysis required by multidisciplinary research?
- How should the university manage access to and funding for electronic texts and information services that are charged on a per-use basis rather than sold outright? Should such charges be passed through to users, as long-distance telephone and other priced services often are?
- How far beyond conventional print materials should the library's responsibility extend, particularly in electronically stored information?
- How should the university deal with the space requirements for storage of the ever-increasing volume of printed scholarly materials?
- What should be the instructional role of libraries?

Policy issues need to be addressed specifically and regularly in each university. Faculty, librarians, and administrative officers must all take part in the process. Librarians have the responsibility to bring the issues to the table and press for a response, but they should not be expected to set policy in isolation.

Recommendations

Policy guidance, while essential, is not enough. The capabilities required to act must also be in place. While many specific points were made during RLC deliberations, they can be gathered under a few principal heads.

The Library of Congress

The relationship of the Library of Congress (LC) to other "national" collections must be carefully reexamined. A means to assess periodically the needs and performance of that relationship should be created, with special attention to the state of the nation's resources and services for research.

For research librarians and for scholars working in humanistic and historical fields, the Library of Congress is an institution of great importance. The many bibliographic services, especially LC bibliographic records, serve as the national standard. The special formats of material, such as maps and recordings, that are comprehensively collected and cataloged add substantially to the national pool. The LC collections range widely and deeply into almost all areas of interest to researchers, and again, the comprehensive inclusion of special materials — prints, photographs, music, manuscripts — that complement printed works make the library a national treasure for scholars.

But even given the distinction of the Library of Congress, from the scholar's point of view the *de facto* national library for humanistic and historical scholarship is the aggregate of the Library of Congress and the other academic and independent research libraries with distinctive collections. This small group of libraries, collectively, contains scholarly resources that are unmatched in any country of the world. However, there is too little true collaboration among them and with the Library of Congress to assure that the full benefits those resources offer are realized and their comprehensiveness maintained.

Change in every aspect of our national information structure and the importance of such change to the national well-being calls for broad and consistent public attention to the quality of the nation's research base. Scholars, the directors of principal research libraries, and the Library of Congress need to join forces and plot the course for a fully productive alliance.

Commitment to collaboration

Historically, research libraries collected and acted in isolation from each other. Individuals visited libraries to make use of available collections and went elsewhere for what they did not find. During the past 50 years, research libraries have sought to respond to what have become essentially unconstrained interests of faculty and the ever-expanding agenda of higher education. Collections became global in coverage, the categories of publications acquired increased, and, still, user expectations have consistently kept ahead of collecting efforts.

The sheer quantity of material has made self-sufficiency an unrealistic aspiration. In both collecting and building the bibliographic base, interdependence is now an acknowledged, but not necessarily fully

embraced, principle. Underscoring the fact, telecommunications capabilities have expanded dramatically and changed forever the relationship among libraries and between libraries, their users, and the producers of information.

While a far-distant future may hold the prospect that some combination of perfectly integrated technologies will make all information personally accessible (the ultimate form of academic independence), the reality is that all of the forces at work — e.g., the rapidly growing quantity of information sources, the increasing complexity of demand, the volatility of technology, and the obvious presence of escalating costs inherent in any dynamic setting — make it essential that there be an aggressive commitment to effective collaboration. Improving the capacity to shape and use cooperative enterprises deserves full administrative attention. Here, perhaps more than in any other university effort, innovation in organization, appropriate financing, and assessment of performance is required.

Research libraries and scholarly communication

Scholarly Communication, the report of the ACLS-sponsored National Enquiry, clearly and forcefully describes scholarly communication as a system of interdependent elements — the interests and work of individual scholars, the disciplines, research libraries, the book and journal publishing communities, and public and private funding sources. Action (or inaction) in one element inevitably affects all others. This message of 10 years ago is still valid and is still insufficiently attended to. It is essential, in the light of the great changes now under way in each system component, that the scholarly community take the lead in assessing the impact of actual and projected change on system performance and in making visible both negative and positive results. Changes made anywhere in the system, including in the practices of scholars themselves, need to be scrutinized regularly. Promising trends need to be encouraged; disturbing ones should quickly be explored and, if truly threatening, forcefully identified. Communication among scholars, across disciplines, and between the world of scholarship and society at large must be unconstrained and effective. The scholarly world, both for its own well-being and for the public benefit, must be the system monitor.

The library in the university structure

The scope of library responsibilities reaches across all academic levels and affects all fields of study. Research libraries, by their nature, not only respond to individual users; they also influence what users do. The work of universities is inseparable from the substance of libraries, and the continuity inherent in the scholarly enterprise is reflected in every aspect of library operations. Libraries can be active contributors to the work of universities, but only if librarians are constructively involved in the development of academic programs. It is essential that the library be linked effectively to the faculty and the academic and administrative leadership of the university and that each of those university sectors does what is required to make the process work.

The library staff

The university community obviously expects that library management will be responsible, imaginative, and productive. Collections must be built and maintained, needs of users met, and operating capabilities constantly refined to contain costs and assure that future as well as present interests are served.

But universities should expect a great deal more than managerial competence. Librarians are each university's information service specialists. Of necessity, all librarians should be well informed about the issues of the information age — the structures for publication and distribution, information economics, government information policy, direct and indirect constraints on access to information, and the influence of information technologies. Some must have a sound understanding of the capabilities and prospects for the technologies pertinent to scholarly communication and library operations, not simply the techniques of use. Many staff members must have an active interest in a subject area, because a professional staff with strong academic credentials and a visible academic presence can greatly extend the range and influence of library service. Further, at least some staff members should be capable teachers, not only of the techniques of library use but of the substance of their calling, helping students to understand the information setting in which they will live and work.

While scholarship and the nation's information structure are inseparable, an understanding of how that structure works and its effect on research and teaching is not yet well developed. Broad-gauged,

interdisciplinary research in information studies is required, and librarians have an obligation to encourage such work. As those in the academic enterprise most knowledgeable about the organization and management of information, librarians need to contribute to the analytical work that is required for a better understanding of how information is generated and used. Librarians need also to work with the growing number of scholars who are adopting information technologies for their research, both to assure that library systems enhance such scholarship and to assure that research results can be productively integrated into library information services.

The factors that affect the flow of information within disciplines, among institutions, through society, and across borders must be identified and their importance to the educational enterprise understood. The ultimate responsibilities of the profession are to control information system complexity, to maintain information authenticity, to assure equitable access to information, and to promote effective use, by all components of society, of that which has been learned.

Funding

The budgets of research libraries are always complex and often incomplete — complex because they reflect a continuing capital investment in building and maintaining a research collection as well as the costs of current service and instructional support, and incomplete because, in most cases, such items as space costs and certain components of institutional overhead are seldom included. Funding is further complicated by the need to invest in the information technology now required with no clear sense of the magnitude of continuing costs, and by the growing number of costly commercial information services being offered to libraries and their users.

Library costs need to be more carefully dissected and better understood in order that the value of past investment in collections not be unduly jeopardized and to insure that the fiscal implications of innovation are fully understood. Policies and costs must be more carefully related to each other, and the long-term financial implications of policy decisions need to be fully described.

The capabilities of the information age cannot be viewed simply as an extrapolation of what has gone before. They are essentially additive, and the new costs as well as current funding realities suggest that

some subtractions from established operating patterns will be required to keep accounts in balance.

A Final Note

The Research Library Committee has been able to underscore the importance of its assignment, it has identified issues that need attention, and it has speculated about the implications of alternative courses of action. It cannot by itself, however, take effective action. Given a topic as complex and diffuse as the future form of research libraries and the information structure underlying teaching and scholarship in humanistic and historical studies, action will have to come in many places and over a period of time.

This statement reaches the obvious but not always recognized conclusion that each university should put in place a continuing capability to set and make known its particular specifications for library resources and services. For such an important matter, an institutional touchstone is required to help keep expectations realistic, to guide the administration of libraries, and to provide a base for assessing the costs, values, and service implications of offerings from the growing number of information vendors seeking a market for their wares.

Beyond the large array of immediate questions, there are other topics of great interest needing attention. The economics of information, information ownership, the influence of technology on access to information, public information policy (both national and international), and factors affecting information utility are only examples. The discussions of the Research Library Committee mark the beginning of a new effort to deal with one of the most important and complex subjects of our time, but it is certain that the discussion must be a continuing one if the voice of the academic world is to be heard by those shaping the information age.

The Future of The Library: A View From The Provost's Office

Billy E. Frye
Emory University

When my daughter Alice was about three years old, she and her mother engaged in a discussion about growing up, specifically marriage and family, and she announced, "When I grow up, I'm going to marry Daddy." "But honey," her mom said, hoping to explain the inexplicable to a three year old, "you can't do that. Daddy's already married to me." Alice's reply, a stern and authoritative echo of a lesson she was herself struggling to learn was, "Well, Mommy, you'll just have to learn to share!"

That is my main point. Let me spend the remainder of my time telling you why I believe it is so. To do this, I will read an imaginary letter that you might receive from your president or provost.

Dear Colleagues:

I am writing to begin a dialogue about a matter of great importance to each of us: the future of the university library.

If, as I suppose, our objective is to provide our faculty and students now and in the future generations with the greatest amount of information resources and services that we can for the money that we shall have to spend, some of our most fundamental expectations of the library will have to change. Specifically there will have to be a shift from a principal (if not absolute) emphasis on building the largest collection of published and archival material that we can afford, to an emphasis on making accessible to you the users the greatest amount of information we can, wherever it is located, and in whatever format. Our primary goal for the library must shift from maximum *ownership* of material to maximum *access* to materials.

The reasons why I think this is so lie in three areas: costs, technology, and intellectual need.

It is common knowledge that books and journals have become much more expensive in recent years. But do we fully appreciate the facts: that journal prices have risen by 400% in the past 20 years, and

books by almost 40% in the past 5; that on the order of 15% of our expenditures for library services now goes for computer technology that didn't exist 20-30 years ago; that the amount of published material worldwide that our and other libraries will need to acquire will increase by as much as 50-100%, while prices continue to outstrip both the general rate of inflation and the rate of growth of the university's resources; that despite more than a 300% growth in expenditures in the past 20 years, acquisition of books and monographs declined by 30%, and we have been forced to significantly cut our journal subscriptions; do we further understand that 30% or more of our collections printed on acidic paper will crumble in our grasp within the next few decades unless steps are taken to preserve it, at great cost; that if we continue to acquire new materials at the present rate, much less at the rate we might wish to, we shall have to build new space at a cost of tens of millions of dollars, with associated ongoing maintenance and operating expenses.

These things add up to enormous costs that we simply cannot afford. Moreover, university resources, already tight, will grow even tighter over the next decade, as we face limits on tuition increases; as competition for faculty grows increasingly fierce with the forthcoming Ph.D. shortage; as we struggle with the renewal of our physical plant; and as we try to maintain our commitments to both teaching and research excellence in a broad array of programs.

If cost necessitates change, technology provides the opportunity and the means for it. Beyond its familiar impact upon the internal operations of our own library, computer technology has enabled the establishment of national databases about library holdings, promoted uniform standards, and created powerful networks for quick and inexpensive distribution of information. We are told that we are on the threshold, some suggest within five years, of the capability of electronic publication and transmission of complete texts. If so, soon it will no longer be possible to deny shared collection development on grounds of technological feasibility. Moreover, this technology will itself almost surely provide a further incentive for change as a competitive "information market" develops.

In the final analysis, then, the need for shared collection development and access rests upon the need to do better what the library was invented for in the first place. The ultimate argument is neither costs

nor technology, but what intellectual resources can and should we have access to.

Stating the problem is easy; and if we set aside our traditional prejudices, it takes no genius to name cooperation as the only tenable solution. Envisioning how it can happen is another matter. But although the glass of ignorance through which I view these matters is very dark indeed, I have some thoughts to suggest. To begin with, we should not fear neglect of our own considerable collections. Indeed, every university will have to maintain basic collections for teaching and research, as well as to accept responsibility for building depth in focused areas of the collections. But we ought to envision a time when the autonomous individual collections of our nation's research libraries are in substantial degree melded into a large dispersed collection to which we all contribute and in which we all share equally, with appropriate allowances for our respective needs and investments; a time when our faculty and librarians will make choices between acquisitions and other expenditures not on the criterion of "volumes added," but on the basis of "units of access" provided. We may hope for a time when the Library of Congress will truly function as a national library at the hub of a nexus of collections, and not just as *the* library of *the* Congress; and a time when important regional or national consortia, such as the Research Libraries Group and the Center for Research Libraries, may not only help guide the collection policies of their individual members, but supplement those physical collections with regional or national collections that are mutually owned and operated.

There is much I cannot visualize, of course, such as how the economics of the publishing industry will adjust to such new modes, or how copyright law can be revised to continue to protect the rights of publishers and authors. But these should not be used as excuses not to confront the problem.

There will be losses of course: some degree of autonomy will have to be sacrificed; collective ownership implies some loss of the preferential treatment that we expect of our own library. And to the extent that we commit more of our resources to the support of such cooperative programs the growth in our own acquisitions budget may be curtailed. But considering the erosive forces that are already reducing to myth any idea of maintaining comprehensive collections in our own library, the net effect of such trade-offs can only be positive.

Cooperation among libraries is not a new idea, of course, and cooperative organizations have had a major impact upon librarianship, ranging from expansion of interlibrary loan services, to the development of tools for acquiring, cataloging, searching, and sharing information electronically. But these developments have for the most part been in service of the traditional role of the library and have had relatively little effect in focusing the collective capabilities of research libraries on the task of developing the best possible national library resources and in bringing acquisition costs back within our range of budgetary capacity.

If shared collection development has failed up until now, why should we expect it to succeed in the future? I would suggest that this failure is in part the result of failure of the scholarly community to engage change, and perhaps even to our active resistance to it. When we demand the greatest possible expenditure on acquisitions year after year; when we measure the success of the library in terms of volumes added; when so much of our sense of stature and pride is vested in the library; and when we structure our library budgets so that cooperative programs are directly competitive with acquisitions, even the most far-sighted librarian can do little. Inevitably the consortia which they comprise reflect this pressure, and so little creative effort goes into changing our traditional approaches to collection development.

It is hard to know what steps need to be taken to escape from this situation and move us from speculation to action, but in conclusion I will suggest two things that need to happen concurrently. First, we and other faculties need to commit ourselves to full exploration of the possibilities that cooperation offers for future collection development and access. Second, we need to direct or redirect existing consortia to focus primarily upon this issue, give them the support and freedom to do so, or if necessary create other organizations that can.

To initiate these steps on our own campus, I will shortly establish an office of library planning and development. This office will be under the supervision of the University Librarian and will report directly to me. In order to extricate it from the ongoing business of the library, a budget and staff will be established for this office independent of current library operations, and support for it in future years will be as determined by its ability to demonstrate progress toward making shared

collection development a reality. An advisory council will be created to plan and direct the efforts of this office.

Its most immediate tasks will be (1) to conceptualize in practical terms the alternatives that are presented by the prospect of cooperative collection development; (2) to assess the costs and benefits of these alternatives over the next 10-20 years as compared to our traditional approach and to define ways by which we can measure and reward progress; (3) to evaluate the feasibility of the proposition of shared collection development in terms of available or prospective technology, costs, and organizational capability; (4) to determine which part of our collections are most amenable to shared collection development and which we should continue to focus on locally; (5) to support and direct our policies toward cooperative library programs in which we participate, including, for example, the Research Libraries Group, the OCLC, and the National Preservation Commission; (6) to find ways to educate and engage the faculty in these issues; and (7) finally to advise the university community in general concerning what it should do in the coming years to help make shared collection development a reality.

There is probably much that is naive, vague, overly optimistic, overlooked, or otherwise mistaken in these remarks. But I am firmly convinced that the fundamental points are valid: that we have much to gain by moving thoughtfully from our present stance of rugged individualism to a cooperative approach to collection development and management; and that in our own self-interest we, the faculty, must become engaged in decisions about our options. I ask you to enter into serious consideration of these matters, and I look forward to your response and the opportunity for further discussion.

Sincerely,

John Doe, Provost

Postscript: I ask you, colleagues, would such a provost be better advised to put his creative writing talents into preparing a letter of resignation, or could he hope when asked about his faith in shared collection development in a few years to be able to reply as did the man who was asked if he believed in baptism by immersion: Believe in it! Why I've *seen* it!!

Thank you.

The Needs of Scholars: Libraries in Transformation

D. Kaye Gapen
University of Wisconsin, Madison

I would like to share with you a few examples of faculty requests for library support which I am seeing at the University of Wisconsin, Madison:

- A significant increase in the amount of intra- and interdisciplinary research — with requests from faculty members in the many disciplines involved for the creation of new libraries to meet their needs:
 - asking for collections to be brought together
 - asking for expert librarian reference and information assistance
 - asking to be able to acquire, store, and retrieve new formats
- A significant increase in the kinds of research which involve simulation, modeling, and visualization — working from digitized and numerical primary sources:
 - requiring the archiving of the primary digitized source
 - requiring the storage and retrieval of graphical and visual result
- In the humanities a significant increase in the use of scanning and the Kurtzweil technologies to turn print publications into digitized formats for computer-based analysis
- A steadily increasing number of requests for assistance in choosing the software for managing individual faculty information — PIM's (personal information management software)
- A steadily increasing number of requests for assistance in choosing and using the communications software packages required for using online library systems and other online information resources
- Requests regarding the library's present or potential capabilities for the creation of online textbooks
- A steadily increasing number of faculty members developing video- and micro-based courses wishing to be able to place the courses in the library as a type of reserve collection for student use

- A steadily increasing number of requests for classes conducted by librarians in the introduction to libraries, to online information resources, and in personal information management software and techniques — for their undergraduates, for their graduates, and often for themselves
- On Bitnet, over 2,000 subject interest lists created by faculty and staff members for communication regarding topics in their disciplines — with requests for information noted in the Bitnet list

What do trends like these mean for libraries and their parent universities? Before we begin to draw conclusions, we must consider a few facts:

- Print and near-print publishing has doubled every 10 years since the 1930's and the trend is continuing
- Digitized publications available for purchase or selection by librarians have been doubling in quantity annually since the middle 1980's
- Rapid growth of campus, state, national, and international high-speed telecommunications networks
- Growth in faculty interest in librarians' information literacy-focused courses

Patterns such as these have produced a research library which today combines four models of library service. These include the following:

- Library as repository
- Library as electronically supported channel for scholarly communication — for both teaching and research
- Library as teacher — beyond bibliographic instruction to information literacy which flows into the faculty teaching of critical thinking
- The physical library and the logical library

Supporting the four models congruently has many implications for the functions, financing, contents, and accessibility of library collections and programs. First, all four models must be supported at the same time. We know how to manage and fund the repository library. We are learning how to manage the electronic library, but we are still learning how to fund it. The electronic communication channel library requires

a much higher level of equipment budget, as well as significantly higher budget support for reskilling staff and for staff development.

In fact, staff support is one of the most serious challenges facing libraries and their parent institutions today. We need new skills which encompass the newer technologies. Thus, we need new and different training programs. In addition, staff with different skills and professional experience are joining with librarians in the continuing development of library programs.

Integration of other professionals requires the refinement of staff evaluation programs and a new look at the assessment of professional service as it relates to merit considerations, promotion, and tenure (or its equivalent).

Second, the resulting library is intellectually labor intensive more so than the repository library which is more physically labor intensive. Therefore, today's library requires more staff rather than less, and the library staff need to be more highly paid as responsibilities are becoming more complex. Finally, competitive salaries must be responsive to a greater variety of markets. Resulting salaries among types of professional library staff at times may create uneasiness among all library staff.

Third, in today's library "access" is becoming as important as "ownership" of scholarship and information. Comparing today's experience with that of the past indicates that faculty use of libraries continues to differ by discipline. In order for today's library to be responsive to faculty in the varied disciplines of a university, varied patterns have to be budgeted for and implemented. For example, not only do print collections have to be acquired which support teaching and research programs, equipment and staff training also have to be provided for gateway access to digitized databases and information sources. Both have to be in place to meet the needs of faculty members who continue to rely heavily on print and near-print publications, as well as meeting the information needs of scientists who are beginning to rely heavily on digitized publications and online databases.

There are a bevy of new copyright and intellectual property rights issues related to campus reliance on digitized publications. In addition, accreditation standards must be adapted to include an assessment of information gateways established via the library, complementing the evaluation of the library's repository print and near-print collections.

Finally, the communal environment in which libraries have forged partnerships is also in evolution as a result of the impact of technology. An increasing number of interleaving decisions are now being made by librarians in conjunction with computer center staff, telecommunications staff, and by faculty and deans in the purchase, implementation, and use of information technologies.

Wisconsin as a scenario

The University of Wisconsin, Madison libraries can serve as a useful scenario exemplifying the results of the kinds of changes which I have been describing. An online library system has been in use since mid-1983, now supporting all of the major functions of a normal library system: public catalog, name and subject heading controlling capability, journal control system, ordering/acquisitions system, circulation system, and telecommunications capabilities.

To that basic online information system is now being added a software subsystem which will provide online campus access to the full-text databases becoming increasingly available: e.g., *New York Times*, encyclopedias, chemistry journals, and so forth. In addition, the software also handles indexes and abstracts like Medline, Biosis, the Humanities Index, and so forth. It is a simple step in imagination to realize that the same information handling capabilities can provide access to faculty research databases, procedural manuals, and the like.

The next horizon addition to this evolving fully capable information system is the exploration of expanding the capabilities of the online information system centrally to store and retrieve large databases of "images" — digitized photographs, graphics, modeling, visualization research, acidic and deteriorating publications, and so forth. All of these capabilities are available through telecommunications linkages and networks such as Bitnet and other networks which together comprise the Internet.

Finally, microcomputer laboratories have now been located in five of the 22 libraries of record on campus. These centers are staffed by librarians who not only provide assistance in the use of general software, but also provide networking of CD-ROM publications, courseware put on reserve by faculty members, courseware on the use of library and information resources developed by library staff, and telecommunications linkages to the online library information system.

In summary, the libraries on the Madison campus are still very much “repository libraries” providing physical housing and access to print and near-print publications. We expect to continue that role well into the next century. Complementing that collection and supporting staff service programs is the expanding capabilities of the library as electronic communication channel with its accompanying expansion in potential for enhancing faculty and student productivity. Finally, we have the emerging role of library as teacher, bringing sense and sensibility to what can seem a chaos of information glut. Taken together, balanced through careful and daring budgeting, and continually supported by expert librarians who creatively anticipate future academic needs, the library of the 21st century begins to exist today.

Access to Scholarly Materials

Patricia Battin

Commission on Preservation and Access

Last October I was asked by the M.I.T. Communications Seminar to join a group of futurists to discourse on my vision of the “electronic library.” For the last 10 years, I have lived a disconcerting schizophrenic existence — in the company of humanists and my library colleagues, I am cast as a flaming radical, because I dare to talk about change, but in the midst of engineers and computer scientists, I suddenly become a veritable pin-striped conservative. While my colleagues on the panel spoke enthusiastically about “knowbots” and other digital aliens of the future, I was full of caution about the transformation process, the real world, and our continuing capacity to provide access to recorded knowledge.

The year 2010 will represent the end (or at least a milestone) of an organized 20-year effort to preserve our crumbling knowledge base recorded on acid paper. Also in 2010, we are told, scholarship, libraries, and publishing will be completely transformed. Students, scholars, and librarians will be sitting in front of powerful workstations, linked around the world, sending and receiving both textual and non-textual data, images of a quality higher than the original, voice, music, and other forms of multimedia not yet known to us.

Vast amounts of text and image will be stored optically, and inexpensive bound volumes will be available on demand. Sophisticated artificial intelligence software and expert systems will guide the user to the desired information and provide custom-made packages of selected information to be routinely digested by the individual consumer.

Well, I asked — what’s wrong with this picture? Nothing, except the fact that, despite this eminently plausible and even conservative scenario from a technological perspective, most of the nation’s private colleges and universities and well over half of the public institutions

filed for bankruptcy in the mid-1990's in a futile effort to pay the staggering costs generated by the enthusiastic and indiscriminate adoption of information technology in the exuberant 1980's.

On the other hand, back in 1850, there undoubtedly were similar skeptics decrying the enthusiasm for cheaply produced acidic books which fueled the spread of literacy and the amazing explosion of scholarship. The mere notion of huge multi-million volume collections of books and journals, meticulously cataloged, and housed in massive buildings duplicated across the country at enormous expense was probably ridiculed in similar fashion. And yet the 19th century concept of the research library — the acquisition and storage of printed materials, organized and cataloged according to nationally accepted bibliographic standards, and subsidized by private and public institutions of higher education — became our primary means of providing access to recorded knowledge.

I think my schizoid experience is a metaphor for the condition research libraries and the scholarly community face today. We can't afford, intellectually or financially, to maintain the historic model, any more than we can afford, intellectually or financially, to unthinkingly jettison print on paper, a refereed publishing process, and an institutional archival responsibility for the technical glories of an ill-defined electronic scholarly communication process. The characteristics of information technology and its extraordinary impact on the scholarly process and the quest for knowledge are such that the past is no paradigm for the future.

The most significant change, in my opinion, is that we can now generate, store, disseminate, and use a scholarly work in different formats. We can store text in image format — on paper, film, or CD-ROM's. We can store text in ASCII format on a variety of media. The technology exists to disseminate it by parcel post, UPS, FAX, or data networks and to repackage it in a variety of convenient formats for the requesting scholar, depending upon the contemplated use.

In the academic community, it is far easier to create than to transform; easier to introduce new networking capabilities, electronic mail, and sophisticated retrieval mechanisms than to link those capacities in a meaningful manner to the information habits of working scholars, whose inquiries span decades, disciplines, and formats.

If we are to proceed in an intellectually responsible way to transform our research libraries — our 19th and 20th century means of providing access to our society's accumulated knowledge — I think we need to separate myth from fact.

It is a human tendency, I have found, to demand, in the transformation process, absolute perfection from the new model and adamantly deny the failings of the tried and true.

What's wrong with the old model?

- Paper disintegrates: we have an enormous and costly deferred maintenance challenge on our hands if we are to insure access for future generations to the literature of the past.
- The rate of publication continues to increase, demanding more space and more dollars to collect less and less of the world output of publications.
- Periodical costs continue to escalate: up 9.5% for 1990.
- Average price for domestic serials — 1990 = \$93.45
1989 = \$85.37
- Our large research libraries report that in the past 15 years, their annual acquisition of the world's literature has declined from 15% to 5% in 1989. Statistics of ARL libraries indicate that "volumes added" declined during 14 of the last 19 years through 1988; the average collection nevertheless doubled in less than 19 years.
- The illusion of space for continuing storage of print on paper in most of our universities is just that — an illusion.
- Despite the spectacular growth of bibliographic utilities during the last decade, cataloging arrearages continue to grow in large research libraries, so that access to acquired materials is severely limited or non-existent.

One hundred and fifty years ago, the innovative technology of acid paper provided the foundation for a greatly expanded system of scholarly communication. We stand again at such a watershed, and we can't afford it all. Unlike the book, the visible, intrinsic obsolescence of the new storage media and access to hard- and software now forces us to confront upfront the costs of insuring access to future generations as we design the library of the future. How can we use this amazing

capacity to generate, store, disseminate, and use information in an intellectually and financially responsible way which enables us to insure our primary objective of access to a very broad, very disparate scholarly clientele?

The new technologies bring with them their own set of access barriers:

- Transitory hardware and software storage and access systems
- A wide range of storage media of uncertain longevity
- Lack of standards for every aspect of electronic communication, reminiscent of the old institution-specific bibliographic systems
- A whole new set of quality control concerns, such as the authenticity of the information and the quality of the database
- The need for a new and costly infrastructure of networks, hardware, and software to provide access to all
- Problem of controlling costs centrally in a system of distributed access
- Capacity to control the distribution and ownership of electronic information: The ALA has monitored government publication through the past decade and issued a continuing report entitled "Less Access to Less Information by and about the U.S. Government." A strong federal trend toward privatization of information published at taxpayer expense has severely constrained access to important research materials.

How do we transform our research libraries in an intellectually and financially responsible manner? What do we give up and what do we carry forward with us? How do we assess the value of the new technologies to the primary mission of instruction and scholarship so that we have reasonable grounds on which to accept or reject their utilization?

We have to take a clear-eyed look at our mythologies. How much browsing really takes place? Is it worth the enormous cost of space? Is it worth giving up access to a much larger slice of the world's literature in order to have an increasingly smaller selection at hand? Is it worth crippling the institution's efforts to share the costs of bibliographic control, archival storage, and more efficient means of document and content delivery?

These are the painful questions we must explore together if we are to provide the scholars of the 21st century the breadth of access to scholarly resources that we have known. As one of my colleagues recently observed, sticking our heads in the sand is not an option.

Choice is the key word in librarianship today, as it is in the broader higher education community. The making of choices now permeates the entire process of developing collection strategies and insuring continuing access to our knowledge resources. And since no one institution can do it all, we need to develop a rational, cooperative national context in which local and regional decisions can be made. The higher education community is faced with three formidable obstacles to traditional access: lack of space to continue as before, the costly preservation of our historic knowledge base, and inadequate financial resources to support the traditional concept of the research library.

More than 40 years ago, my father, a politically conservative businessman with a sketchy educational background, taught his politically liberal, self-styled intellectual daughter an enduring lesson. I came home from my radical-chic college to find he had purchased the newest bourgeois monstrosity — a primitive black and white television set. After listening patiently to my intellectually pretentious railings, he said to me quietly and firmly that the new technology was here to stay, that it would be a major force in the world I would live in, and that I had better put my energies into channeling its potential into socially useful purposes. And so it is with information technology. If we don't recognize what has happened, we could lose it all. Universities and colleges won't be able to afford books and journals, our massive collections of acid paper will turn to dust, and we will be forced to buy, screen by screen for a hefty fee, the privilege of exploring the knowledge we have created.

In the 21st century, we face not only the preservation of the storage medium, but more importantly, the assurance of access. The library as a social institution was created to provide continuing and equitable access to knowledge in a free society. In the past, we could achieve that goal by storing, preserving, and providing access to printed books and journals. Access in the Information Age will be infinitely more complex, since we must insure not only the longevity of the storage medium, but the means of access and retrieval as well.

Lights Are On, Will Anybody Be Home?

*A. Richard Turner
New York University*

Concerning the title of this panel [Scholars and Research Libraries in the 21st Century], the one thing I'm sure of is that I'll be dead for most or all of the period in question. At least there's the solace of knowing that my scholarly progeny will be roaming the stacks.

But what will be their intellectual quality, and how satisfying a social, ethnic, and racial cross-section of the talented will they represent? My remarks are not about what research libraries will be like, rather about the nature and quality of their future clients. Does the responsibility of the research library commence when the professionally committed scholar walks through the door? Or given the contracting borders of the culture of the book, does the library bear a share of responsibility in educating the promising undergraduate, in enticing him/her towards a life in scholarship? I risk being off the mark of the intent of this panel, but believe deeply that an assumption of a business-as-usual flow of humanists into the professoriate, and hence into the research library, would be a serious error.

I'm therefore going to talk about current undergraduate students, who will be the users of the research library in the next century.

I teach three kinds of students. A small group I'll call the Stuyvesant-Andover variety, largely at home in the culture of libraries and their varied contents. The rest fall into two groups. The first is mostly middle class, some extremely intelligent, but by and large unbruised by unsettling ideas, and often under specific vocational pressure from their families. The second includes some individuals of high raw intelligence. Not infrequently they come from disadvantaged social and economic backgrounds, may be new immigrants, and first generation college attendees. For almost all of this group a life in scholarship is an unimagined possibility.

Of these latter two groups, perhaps half, I would say, are not in the habit of reading and writing. Notice I did not say ripe for remediation. Whatever their current abilities or potential, they by preference do not engage in these activities any more than they have to. Their cultural equipment tilts to the oral and visual, and a surprising number of them are fluent in the *homo ludens* sandbox of electronic manipulations. They often view books as so many warehouse inventories from which unconnected parts can be ordered on demand. The idea of reading as a meeting of interesting minds generally eludes them.

This is a blunt, perhaps caricatured, assessment, and in a mood of cynicism one might say fine, process them and send them out to sell used cars. But we know this attitude won't do: in that mass there is an intelligent and inquisitive minority capable of a life of the mind of which they themselves have not even dreamed. If they are to have that dream, we've got to get them hooked on the library.

In a time filled with challenges to the intellectual and curricular status quo, we easily forget that the most genuinely subversive thing we can do is to give a student a library card, thereby potentially opening a world of intimate and often troubling revelations over which we properly have no control. But how do we get the student to use that card, to enter an unsuspected world? Our faculty lead-the-horse-to-water-and-the-best-will-drink mentality is unacceptable: we need to take more pro-active steps. Let me get specific and offer some illustrative suggestions.

First, I believe if two years pass without the student moving beyond the paperbacks in the bookstore and the reserve desk in the library, the game is usually lost. But we are culpable of usually not encouraging this sort of exploration. We need carefully constructed assignments that lead to the stacks, and in the library a tutor ready to stand at the student's shoulder on a one-to-one basis. A tutor's function would not be primarily to teach mechanics; students learn with alacrity online catalogue, and with passive reverence believe the completeness and finality of what the screen serves up to them. Rather these tutors would be coaches in the rudiments of scholarship, implanters of the notions that guiding ideas tend to determine facts rather than vice versa, that the patterns are in the user's head, not in the terminal. In short, the tutor's function is qualitative, to teach that use of the library is a matter

of intelligent strategies, imagination, and discriminating judgment. I see not a few, but dozens of them in service.

Who would these tutors be? I would suggest dissertation-level graduate students, well founded in their disciplines, students who in teaching one-on-one will in turn themselves learn, learn both their subjects and the possibilities and problems of libraries, and in the process receive financial support towards realization of their degrees. Their preparation would require workshops and continuing interaction with the librarians.

Second, it is conventional wisdom that faculty fret over a lack of progressive intellectual sophistication in courses as students move through the major. Generally we do nothing about this, falling back on the time-honored habit that progression means a succession of courses chiefly characterized by a sequence of subject areas narrowing in focus. Perhaps not much can be done about this, but it would be possible to hand-tailor a series of progressively more complex library challenges for that handful of promising individuals who begin to emerge from the pack. This would require a careful tracking of courses elected, consultation between a given student's teachers on a continuing basis, and the use of the sort of tutors already mentioned, working in conjunction with faculty.

Last, we need to identify those few rising seniors who are most promising. Each during the course of the summer or during the senior year should participate in the work in progress of a faculty mentor. Such programs are in place at some institutions, and the reports I have heard are enthusiastic.

You may or may not like these suggestions, but for the sake of argument let's say that you do. What sort of issues would come up in trying to implement them? For starters, the clean budgetary separation of instructional and library budgets would be called into question. Worse, the uneasy truces between the value accorded teaching versus that given research, and between a graduate and undergraduate emphasis in use of faculty time, might begin to unravel. As everyone in this room knows, each institution has its actual practices in these matters, and its rhetorical dissimulations. God help that the discrepancies should rise to the surface. My suspicion is that open discussions of the sort of proposals I have made, or indeed of any others involving new relations

of libraries to their institutions, would flush out a dirty little secret. It is that traditional vehicles of policy formulation, governance, and definition of budgetary units have ever less to do with the realities of the increasingly symbiotic relations of research libraries and the other teaching, research, and functions of the university. In short, we are trying to play a substantially new game by an old set of rules.

But I've begun to go down a road that my time disallows. I'm saying that in the interest of a strong and diverse cohort of tomorrow's humanists, the library, faculty, and administration together had better take another look at what they're doing to and for undergraduates, and I'm further saying that serious discussion of this will doubtless open a can of worms.

In closing, my message is simple. If we do not nurture a talented future clientele now, the research libraries of tomorrow may be like downtown Tulsa today, plenty of real estate, but few live tenants. That nurturing must involve cultivating the poise to process information in the context of those structured intellectual artifacts called books, the ones already written and the ones our students will someday write. Unless we impart this lesson before graduate school, the excitement of scholarship and libraries will be lost on our best students, and they will go elsewhere to make their lives and work.

In all of this, let's not lose sight of what it's all about, knowledge and its structures, not mindless safaris into galaxies of informational garbage. Remember the old Carnegie libraries with names of the worthies chiselled on the frieze? In weaker moments I'm tempted to climb up there and add the names Von Neumann and Turing to the list. But in a saner mood I'd settle for replacing all the names with words written by John Steinbeck a half century ago:

"The design of a book is the pattern of reality controlled and shaped by the mind of the writer. This is completely understood about poetry or fiction, but is too seldom realized about books of fact." (*The Sea of Cortez*)

And, oh yes, I'd make the letters large enough so they'll be legible to the tenured faculty as well as to the students.

Electronic Texts and University Structures

Richard A. Lanham
University of California, Los Angeles

A couple of months ago I happened to hear the Chancellor of my university campus discuss the future of big institutions like UCLA. He was speaking to a small group of university presidents and provosts and library directors — I was invited through a fluke, as a one-time sacrificial humanist — and he spoke with candor. He said a number of surprising things about the financial and political realities of university life, but what piqued my curiosity the most was his insistence that the university should prepare its undergraduate students, seriously and directly, for the world they will really live in, and the lives they will in fact live out. I was struck not so much by the *originality* of this exhortation — although it *was* new coming from the Chancellor — as by the extraordinary changes which would be required if anyone took it to heart. There's not much chance that anyone will, of course, but I couldn't help asking myself what would happen in my neck of the woods — teaching in the arts and letters, and more especially in literature and composition — if someone did.

The students we teach are going to do most of their writing and much of their reading on an electronic screen. They are going to live — they live now — in a world of electronic text. The changes in this regard in the last 10 years have been altogether remarkable. The two predominant learned professions, medicine and law, depend now in fundamental ways on electronic databases.

Most of our students, though, will work not in law or medicine but in the world of business or, as it is out where I live, the business-government-military complex. If we look at the world of “training,” as applied education for business, government, and the military has come to be called — with typical humanistic invidiousness, “training” being inferior to the higher-toned “education” which humanists provide — the dominance of digitally displayed information is even stronger than in the learned professions. The military establishment — an enormous

force in American education since the second World War, and one the university world has always ignored — has moved to interactive video-disk as its central technology. We may anticipate that they will follow the permutations of this technology into unforeseen ground, but wherever they go, it seems unlikely that they will return to pen and paper. The deep changes in the *logos*, in words as our central expressive medium, which I shall describe in a moment, and which have not yet fully reached the university world, are everyday reality there. The training world has much to teach us in the university, though we show no inclination to learn it. This world, we might reflect, is *enormous* — last year, more money was spent in it, and more students educated, than in all of American higher education put together. It constitutes, in fact, the university world's long-delayed "Japan," the main competitor which may finally force some changes in our own institutional practices. And it is a competitor which already has an over-50% market share.

If we glance from business toward the arts, we find an electronic revolution of at least equal magnitude occurring there. Over half of the music performed in the United States last year was digitally based. In the entertainment business where many UCLA students find their living, for example, the whole basis of music has been revolutionized. Musical instruments themselves have changed, the whole 19th century Romantic orchestra collapsing into a generic electronic keyboard, horn, and drum pad. Musical notation, for so long the great bottleneck of musical production, has been taken out of the hands of individual engravers and put on an average electronic desktop. And both composers and performers have been given an enormous repertoire of recorded sounds to play with, reform, and collage, a vast library — usually built into, or bundled with, an electronic keyboard when you buy it — which reminds one of the *topoi* of ancient rhetoric, the stock of ready arguments a classical speaker would regroup into a newly tailored oration. These "samples," as they are usually called, are "revised," as we might say, visually, on an electronic screen as waveforms which can be manipulated by eye and hand before being returned to sound.

If you spend much time in this world, the world of rock music and video, you'll find that those folks live in a genuinely different world from people of my generation, fond as we may be of all the arts. They think of sounds and shapes as interchangeable, and they assume as everyday fact an electronic smithy where all the signals of the sensorium

can be refashioned at will. When I was growing up, the kid who used to take apart old radios was a very different type from the kid who took piano lessons from Miss Fidditch, and both were very different from the infuriating guy in the front row of geometry class — in my class his name was Bill Hoover — who invented proofs which weren't even in the *teacher's* book. Not any more. A new set of types is emerging which mixes the old categories of self — another rhetorical commonplace — very differently.

In the visual arts, to which one naturally segues from music in such a world, digitization has had the same enzymatic effect. Anyone thinking of earning a living as a graphic artist must contemplate doing so using an electronic screen. Everything from advertising to architectural drafting to cartography now possesses a radical electronic base. And yet in one campus of the University of California system where I work, when I recently had occasion to inquire into its offerings in the studio visual arts — one of its strong points, I was told — there wasn't a single course in digital graphics of any sort. Fine Artists presumably do not do this sort of thing. But of course the fine arts are doing it all the time now. And arts which we usually think of as media-based to begin with — film, most obviously — are facing a revolution just as profound as that facing written text.

And there is a profound revolution in educational techniques occurring as well. If we really wanted to prepare our students for it, though, I don't think we should send them to our local Ed School for two years' worth of pedagogical methods. It would make more sense to send them to the firms which are creating the new multimedia programs, firms like The Voyager Co. or And Corp., or Lucasfilm, or the work being done by Disney and MCA for the new generation of theme parks. That's where the real educational revolution is taking pace, the revolution we would attend to if we really wanted to prepare our students for their world rather than ours. Yet again and again, people working in all these areas of the "real world" for which we are now to prepare our students say the same thing: "no one is trained to do not only the work, but the *kind of work*, we need them to do."

Here I must pause for a moment to acknowledge the objections to what I have just said which already must be rising in the breast of every right-thinking humanist. For many humanists, perhaps the majority, would deny that education ought to prepare our students for the world

we live in now. “Surely humanists should be the ones to defend, instead, the traditional culture based on The Great Books, the culture which transcends time and place and will provide a secure platform of ethical values upon which students can stand in a changing world” — should defend everything, that is, which we mean by “education” as against “training.” Or, reading the signs on the other side of the current humanist political boulevard, “Surely humanists should be the ones pointing out the deep internal contradictions of late-capitalist consumerist culture. Surely we should not be teaching our students to accept this world and work in it, but to reject it and subvert it.” These two “Surely” arguments are the most common humanist responses to the educational world we live in now, and I want to assure you that I have not forgotten them and will return to them by and by. But before I do, let me try to map what the world of electronic “text” looks like, and plot on it the changes implied for university and disciplinary structures and procedure.

What happens when you write and read on an electronic screen rather than on a piece of paper? Well, the first change comes in the nature of authority. Humanistic scholarship and humanistic thinking have since the Renaissance been built upon the fixed text, the classical word recovered, edited, and printed in its purity for all time. We have made this over into a general cultural ideal, a fixed canon of Great Books which together embody Western cultural history and moral values. The Great Values all live there in the fixed printed texts, and we need only read and ponder to be made whole again beyond confusion. Clearly enough, electronic text changes all this. The electronic reader, unlike the printed one, can interact with the text and change it, rearrange it with subheadings to make it clearer or suit the immediate purpose, reformat it in a different typeface for easier reading, intersperse it with a commentary no longer marginal but as central as the canonical text itself. Readers become writers. Critics become creators.

Many things change thereby. In electronic artistic media, as Stuart Brand has pointed out, there is no “final cut,” no final form. Films, rock songs, and computer games are now being produced with alternative endings among which the audience may choose. In the computer-based genre of interactive fiction, the reader collaborates with the original author to “write” and at the same time reenact the fiction. Digital music of all sorts is now available which invites, with one degree or another of

conscious didacticism, the creative interaction of the listener/composer. Computer artists work in a medium dynamic by its very nature; their main problem is how to “print” their work — fix it in a single form — for a peripheral non-electronic distribution.

This volatility metamorphoses scholarly inquiry in the same way. Western poetics and philosophy are transformed, for a start. The Aristotelian categories of beginning, middle, and end, it turns out, are based on fixed texts. Think of all the arguments about coherence and Arnoldian perfection of artistic form which are based on these Aristotelian coordinates. Again, such arguments have been made a general ideal of written expression of all sorts. All our arguments build toward a conclusion, a “final cut.” We find scholarly disputation unthinkable without one. How else do we separate the true from the false, the good from the bad?

And this same volatility, as we have already seen, dissolves the boundaries between the arts. At the center of this repositioning in the human sensorium stands a major readjustment of the alphabet/image ratio in ordinary communication. We are now using images for a wide range of communication which formerly used written, alphabetic explanation. We see this not only in the digital videographic effects used on broadcast television, but increasingly in the daily communication and training procedures of business, government, and the military. The cultural prejudices of alphabetic literacy make us interpret this change automatically as a threat and a degradation. People who need a bottle sign to find the liquor store are people who can't read, illiterates.

If we want to prepare our students for the world out there, it must be a new kind of preparation for a very different world. What would a Freshman Composition Handbook look like if it were a guide to the world of electronic text rather than print? What first principles would it avow, and what practices would it advise? I share these speculations with you here because they involve equally the teaching of literature and writing, and because they span the whole spectrum from practical pedagogical details to profound theoretical implications. For what happens to one textbook will happen to them all, to some degree to all books, as electronic instruction moves into the bloodstream of higher education.

What would such an electronic text look like? Well, we must begin by saying that our Handbook cannot be a textbook at all, not a book at all, and that we have as yet no word for the multi-media entity into which it has metamorphosed. And its conception of “text” is so different from print that we probably need another word for it, too. And the “reader” — his or her role differs so from a print reader that we need a new word here, too. Both “author” and “authority” become softened and diffused as the reading event moves from a one-time exchange to a continuing conversation.

Our new text-non-book will be “published” in a different way, too. It will be a dynamic, open-ended information system, critiqued and updated on a daily basis by its users, both local and distant, both teacher and student. It will be “published” on telephone lines — if the regulatory environment permits it — or through fiber optic ISDN (Integrated Services Digital Network) of some sort. Such systemic textbooks will grow, take on local coloration and emphasis, mutate into new forms of collective cultural enterprise, as they become part of that gigantic structure of 30,000 electronic billboards already out there. Not only will the idea of single authorship be knocked for a loop, but royalty payments, copyright law, and academic merit badges for publication as well. Such systems will clearly be self-selective for multiple levels of difficulty, and soon for different languages. They will carry, too, a remarkable charge of self-teaching power which will force renegotiation of the teacher-student contract, a renegotiation already reported by those teaching in networked computer classrooms.

And there will be a final new expressive parameter for the electronic reader as well — the manipulation of scale. The non-linear nature of hypertextual information has been universally remarked upon but dynamic scaling is at least as important. I refer not only to the ability to manipulate typography, crucial as that is, but to decide on what scale you are going to read, what levels of generality you need for your particular purpose. We all do this now by skimming books, of course, but in so doing we often miss — I speak as a dedicated skimmer — crucial elements this way. Outlining programs only suggest how scaling decisions will affect the reading of electronic text. And, of course, every move from single workstation to class network to local and then national network is a scaling decision as well.

Such a delivery system will teach a very different kind of composition lesson; what will it look like? (I know “delivery system” sounds too much like a rival for UPS, but I haven’t come up with a better term.) Here are a few oracular speculations.

First, the essay will no longer be the fundamental unit of writing instruction. The world will not come to an end therefore; the essay was not always central. In classical times it was the declamation, in the Middle Ages, the letter; now it will be something else, partaking I would guess of both declamation and letter.

Second, we can back off a turn or two on the thumbscrew of spelling instruction, spelling checkers being what they are.

Third, surely there will be some kind of fundamental change in the nature of punctuation. The present system was devised as an *aide-memoire* for the public performance of a written text. Electronic text offers a much larger repertoire of performative signs — I am thinking here of the use on bulletin boards of certain letters or signs as tonal colorizers, to indicate the spirit in which to read — and it seems likely that they will come into more common use. Again, I don’t think the world will come to an end if they do. Think of all the human effort spent on teaching the rules of punctuation; suppose we didn’t have to do it. Or at least had some new rules to play around with.

Fourth, writing will be taught as a three-dimensional, not a two-dimensional art. Hypertext does this in one way. Computer animation will do it in another. Prose as we know it, printed prose, is based on an aesthetic of black and white linear renunciation. We use “figures of speech,” but we never let the figures realize themselves in their native iconic form. Ever since Greek rhetoric created the basic figures of speech to recreate in a written culture some of the powers of oral speech and gesture, we have implied patterns — this is what one branch of rhetorical figuration is all about — but we have never let them complete themselves. Now, we can let them explicate themselves in animations selected by the reader. The text will move. And given the current state of digital animation programs, it will move in three dimensions.

And of course we will add the whole dimension of color. We talk about the “colors of rhetoric,” but our texts are all in “black and white,” that phrase itself having come to symbolize the stability of legal writ.

Now, the colors of rhetoric can become indeed multicolored. And with better compression techniques and gigantic memory storage, we can add sound to our reading as well. Word, image, and sound will be inextricably intertwined in a dynamic and continually shifting mixture, as is happening in the world of work. Clearly, we will need a new theory of prose style to cope with it. In fact, I would put the matter more strongly: for the first time, we will have a genuine *theory* of prose style, rather than the present folk wisdom and exercises in the psychology of rumor. It is only by seeing the enormous area of expressiveness which printed prose *excludes* that you see how it works, and that area of exclusion is just what is now coming clear. Think of having a theory of prose style as clear as the periodic table in chemistry. It would make things a lot easier. Upon such a theory our new electronic text non-text non-book will be built.

Fifth, I think this new mixture in the human sensorium will revolutionize the world of instruction which we now stigmatize as “remedial.” Some people are better at images or sounds than at words, and some people who have not had the verbal education they wanted or needed can come to it later in life through images and sounds. It will all be one single spectrum of expressivity, with no need to stigmatize any area of it.

Such a delivery system would condition the teaching of literature, too, would it not? The whole of Aristotelian poetics is pretty much stood on its ear by a changeable, interactive, and non-linear text which has no final beginnings, middles, and endings, no unchanging dominant tonalities, and no non-negotiable rules about verbal excess and expressive self-consciousness. And much of current poststructuralist theory suffers a sea-change as well. If the reader can adjust the writing by becoming the writer, and in any combination desired, a great deal of the current controversy about the role of the reader can be conveniently shelved. There is as much connection between reader and writer, or as little, as you want to dial in. Is every critic a creator and vice versa? Is textual order a product of our rage for it more than of the text itself? We can shelve that debate too. Contrive whatever mixture you want. Is there a neutral language of conceptual expression or is all expression radically metaphorical? If we cannot settle this controversy finally, we can at least point now to a very broad spectrum of expressivity that includes not only words but images and sounds, a spectrum controlled

by a real general theory of expressivity (which is what a theory of prose must become). This spectrum runs from least to most metaphorical and you can locate yourself wherever you want. And you have an identical spectrum for the reader as for the text. Mix and match just as you like, anywhere along either one.

I've said that the world of "remediation" is as print- and book-centered as the rest of our pedagogical apparatus and may be expected to change. If we move our gaze from this bottom of the curriculum to the top, to the interdisciplinary humanities course now attracting so much press attention, we'll see a similar metamorphosis going on. For the deepest implication of electronic text for the teaching of literature is that literature can no longer be taught in isolation from the other arts. Digitization has made the arts interchangeable. You can change a visual signal into a musical one. You can zoom in on a letter until it changes from an alphabetic sign to an abstract pixel-painting. In fact, I suggest that the digital equivalence of the arts has finally provided a genuinely theoretical basis not only for comparing the arts, but for teaching them together. The new theory of prose style proves to be a general theory of style for the arts altogether. Such reflections suggest that the current debate about the humanities curriculum (the streetfight between Great Books and Relevant Race/Gender/Class Books) is *otiose*, based on a print technology totally at variance with the electronic medium in which artistic activity and its reception will take place. And, of course, a completely different kind of educational practice is suggested by this line of thinking, a wholly different kind of core curriculum in fact, dominated by a rhetoric of the digital arts. Again, such an educational *practice* is intrinsically, essentially, self-consciously, *theoretical*.

Electronic text allows us to reconceptualize the whole history of literary criticism; it seems, under electronic light, to consist of a series of arbitrary positions taken toward fixed alphabetic information. The great critics have differed since Aristotle on the nature of structure, on the relation of literature to the other arts of image and sound, on the desirable place and density of verbal ornament, on the self-consciousness with which typographical clues were to be used, to distinguish prose from verse, for example, on the relation of "literary" to "non-literary" discourse, and so on. All of these expressive parameters are so much more easily adjustable in electronic text that perhaps our

historical differences have been generated as much by an inflexible technology as by genuine differences of principle. Might electronic text, by making all arbitrary positions adjustable, make them all potentially correct by removing their contradictions with one another? It will be fun, at all events, to see how things work out. The history of criticism may fall *back into time*, into a continuously roiling present.

Electronic text will also serve as the vehicle for displaying all of Western literature in a new light. Since much of this literature is oral in origin and nature, and self-consciously rhetorical, and since electronic text is both oral and rhetorical to a degree, such “re-purposing” can reveal to us aspects of our greatest works of art — literary, artistic, and musical — which we have never seen before.

I think, then, that the whole of Western culture, for which The Great Books has come to be a convenient shorthand phrase, is not threatened by the world of electronic text, but immensely strengthened and invigorated. I think we shall come to understand our great literary texts, and especially their neglected oral and rhetorical aspects, in ways which we could never before have understood. The Great Books side of our politicized curricular street need not feel imperiled.

But what about the other side, the cultural Left, and its critique of late capitalism? How should that critique react to this unprecedented technological determinism? Here we surprise a curious case of cultural convergence. For, if we look at the world of electronic text from the perspective of what we have come to call Literary Theory, such an electronic world comes not as a technological *vis à tergo*, but as a fulfillment. The conceptual, even the metaphysical, world digital text creates — dynamic rather than static, bi-stable rather than monostable, open-ended rather than complete, participatory rather than authorial, based as much on image and sound as on word — *is* the world of postmodern thought, the world which begins with Italian Futurism and Dada at the beginning of the century and is now being focused in theoretical discussions in disciplines all across the human sciences. In introducing our students to electronic text in the practical world of work, it turns out that we also introduce them to the central issues of our intellectual life. The world of “training” at its most *practical* turns out, in its essential core, to be very like the world of “education” at its most *theoretical*, whichever side of the theoretical street we happen to walk on.

But if the intellectual, humanistic center of our university world, its fundamental debate between Right and Left, is oddly and surprisingly affirmed rather than threatened by the world of electronic text, I'm not sure we can say the same thing for the university's administrative and disciplinary structures. If the arts are finding a common digital base, can the academic disciplines and departments which study them remain indefinitely apart? If the arts and sciences are confronting an emergent discipline we call "visualization," will not such a scientific/humanist half-breed find itself the bastard at the academic family reunion? If what we hopefully call the "real world" is moving toward the electronic word, can we continue to plan our curriculum on great *books*? Can we, in fact, continue to think of the curriculum in our customary linear terms — preparatory courses, intermediate ones, advanced, prerequisites, the whole big catalogue enchilada?

Hypertexts spin a world of information out of a single unitary artistic work or political topic. They bring their "preparation" with them at every point, aim to make the student self-sufficient for information, able to reach back in time and out in space for the "background" needed to understand the "text" at issue. They stand, in their fundamental structure and rationale, at odds with our heretofore unquestioned idea that the curriculum ought to be linear if it possibly could. Especially will this be so if we can succeed in using one part of the brain to illuminate the others in new ways, so that "remedial" students who are good with sights or sounds but not with words can change media when they get stuck. It is not too much to suggest that the whole idea of educational order, at every level, will have to be renegotiated. We won't be able, for a start, to cry "Back to the Basics!" because we really won't know what the "Basics" are.

The question of access to new educational technologies by disadvantaged groups is certainly a hot topic now, but it has not gone beyond wondering how to buy enough computers for everyone. The real issues are considerably deeper and more complex than that. We really must cease conducting the whole "literacy" debate on the basis of a print technology which is even now in radical metamorphosis.

And if to digitize cultural texts is to *desubstantialize* them, what of the whole architectural plan of a university, based as it is on *substance*, the book, the embodied teacher, the chairs we rent out to our students? And what of the only center the multiversity has left, the library? The

library world feels *depaysé* today, and rightly so. Both the physical entities, the buildings and the books they contain, can no longer form the basis for planning. And the curatorial function has metamorphosed, if I may borrow a phrase from an archivist acquaintance, “from curatorial to interpretive.” Librarians of electronic information find their job now a radically rhetorical one — they must consciously construct human attention-structures rather than assemble a collection of books according to commonly accepted rules. They have, perhaps unwillingly, found themselves transported from the ancillary margin of the human sciences to their center. If this be so — and I don’t see how it can be doubted — how should we train librarians, much less plan the building where they will work? Maybe the novelty of the challenge explains why the number of Master of Library Science degrees awarded in the last 10 years has fallen by 50%.

We shall also have to renegotiate completely another aspect of our university structure which we have taken for granted — the environment of copyright law which defines our major product at the university, “intellectual property.” Anglo-American copyright law since the Statute of Anne at the beginning of the 18th century has been built on print, arose from print. And since the famous *Sayre* case of 1785 (the case which first defined the two extremes of social benefit and authorial profit upon which we still proceed) and the subsequent recodification of copyright law by a Victorian statute of 1842, it has built on a second pillar — the idea of originality, or authorial substance and authority. That, too, as we have seen, is called into question by electronic text. Electronic text and copyright law, in fact, are on a collision course at practically every point. Think of all the ways in which the structure of the modern university is based on the idea of originality — faculty recruitment and advancement for a start, all our individual and collective merit badges are tied to that now no longer unquestioned star.

And another protective umbrella, like copyright so familiar and reliable in the world of print that we scarcely notice it, has started to leak. As de Sola Pool points out in a brilliant recent book, *Technologies of Freedom*, the First Amendment guarantees of free speech are strongly print-based as well. These guarantees have by no means been uniformly extended to electronic communication, which tolerates a degree of regulation, by powers both public and private, which we would think intolerable for print. Here, too, a great deal of fundamental rethinking

lies before us. And we might go yet further, into the nature of law itself. The legal changes heralded by electronic text will not be confined to copyright law or First Amendment issues.

The influence of “electronic text,” in our now expanded sense of that term, must then be pervasive. If this is so, why are we not discussing this influence, as in almost every instance of which I am aware, we are not? Surely it is because the university departmental, disciplinary, and administrative structures work implicitly — and often explicitly — to discourage it. It is almost as if the university’s structures were invented specifically to deny a place for such a vital conversation to occur.

Where will the architects of future university information structures come from? Where will they be trained? What *department* will they be in? In humanities, all the basic educational contracts are now being renegotiated — and they are all being renegotiated off campus. If educating our students for the world they will live in, for a competitive global economy and the unprecedented high level of daily symbolic processing which comes with it, really is to be a dominant university purpose rather than a routine Chancellor’s Exhortation, then we must find ways to bring these new contracts onto campus and to understand them. We must modify our departmental and disciplinary structures so that this vital conversation can occur, and be prepared to modify them much more after the conversation has occurred. I am not sure just where the conversation should take place. The library, or library school, seems a logical place. So, from a purely theoretical standpoint, does the Freshman Composition program, since we are dealing with what is finally a revolution in social rhetoric. All the regular academic departments seem disqualified by their characteristic professional bias. Perhaps we need a new entity all together.

But we must begin a coherent central conversation somewhere, and it must include the main players in university governance. If we don’t begin it, and if we don’t move forward swiftly into basic changes in institutional structure and practice, we mustn’t be surprised when American society, public and private, steps in and does it for us. For it is hard not to conclude that what we are doing now is not preparing our students for the world they will really live in, and the lives they will really live out, but training them, instead, to be the “clerks of a forgotten mood.”