The modern library: lost and found*

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The *modern library*, a term that was heard frequently in the mid-twentieth century, has fallen into disuse. The over-promotion of computers and all that their enthusiasts promised probably hastened its demise. Today, networking is transforming how libraries provide—and users seek—information. Although the Internet is the natural environment for the health sciences librarian, it is going through growing pains as we face issues of censorship and standards. Today's "modern librarian" must not only be adept at using the Internet but must become familiar with digital information in all its forms—images, full text, and factual data banks. Most important, to stay "modern," today's librarians must embark on a program of lifelong learning that will enable them to make optimum use of the advantages offered by modern technology.

The video presentation you have just seen gives you the essence of the high-performance computing and communications (HPCC) activities, circa 1995. The earlier years were more focused on basic research; the future plans include more applications. I want medicine, health care, and health sciences libraries to be important parts of that future.

Did you notice that we did not hear the modern library mentioned in the HPCC film? Indeed, when was the last time you heard someone say "the modern library"? Does it sound almost an oxymoron? Do *modern* and *library* go together at all? It puzzles me that we seemed to have had a modern library years ago and now seem to have lost it. I remember the modern library. It was still there in 1950. Even my prep school had one: good books, a nice librarian, and a fireplace to read by. What could possibly have been better or more modern?

As I recall, somewhere around 1960, I stopped hearing the term. The advent of the modern computer must, I suppose, have seemed to the public mind to eclipse the modern library.

What induced us to turn away from the familiar library, with its demands for diligence, training, and attention (not to mention attendance)? Probably the

promise by computer promoters of just about the opposite. That is, computers were said to demand virtually no strenuous effort on the part of the user. Instruction in scholarly conventions and library indexing and cataloging were thought certainly to be irrelevant carry-overs from a gilded age of quill pens and feather dusters. Why, after all, would such things matter when the computer could so easily search free text on whatever words the user uttered? Never mind if there were some problem choosing just the right words; quickly—or, at least, sooner or later—the modern user would surround—if not corner—the sought-for knowledge simply by the shrewd device of a "free text" deluge. Never mind either the temporary inconvenience of having to keyboard one's request. Soon the computer would be taught to understand spoken requests.

As to the issue of physically going to the library—this, too, we heard, would soon be obviated by computer systems. After all, because storing information in computer-based storing systems seemed so clearly to be more dense, compact, and efficient than in books, the survival of the paper-based old things seemed quite unlikely. And as for leather bindings—well!

I remember a speaker telling our medical faculty at Missouri in 1962 that the "rotating disk memory storage unit" that IBM sold would hold just about all the medical records in our university hospital. In another setting but in the same sizzling sixties, another

director told me personally that his computer rotating storage device would hold all the medical records at the Massachusetts General Hospital and that once this was "done," he intended to offer the remaining capacity to the other hospitals in town. So, we conclude, the computer people overspoke and underperformed.

How were health sciences libraries themselves doing during this time? In fact, not especially well. By 1960, although book collections were modest but stable, the volume of periodical literature was increasing significantly. The National Library of Medicine (NLM) systems for indexing and "announcing" these publications were overloaded and untimely. *Index Medicus* itself could be months late. Of course, most health sciences librarians know that it was precisely this problem that drove NLM to investigate and later adopt the new computer technology.

The advent of the computer-produced *Index Medicus* led to systems for automating the search for scientific articles. Even if these searches took weeks to be returned to the requester—as they did—the result was rightly viewed as close to miraculous. Thus, even before the advent of much-improved online searching systems, we had essentially lost the idea of the modern library. The residual value of this concept had already become utterly subsumed by the idea of computers and files. Even the connection between these wondrous computer artifacts and the national library that produced them was swiftly lost. Certainly, the connection was not always emphasized by vendors, who (perhaps naturally) strove to connect in the user's mind the medical bibliographic data with other elements of their commercial (but somewhat disembodied) product line. In other words, the selling of computer-based information products without connection to libraries paralleled the commercial promotion of consumer items such as bacon without a connection to pigs—or to farmers. My wife's friend in school asked her one day, "Mary, what is a veal? I don't think I've ever seen one."

The system of connections between computers and their users has remade our world even more than the computers themselves. Network technology has produced remarkable increases in the connectedness of medical institutions—especially of health sciences libraries. The modern electronic telecommunications system is a U.S. invention. Tymnet set new standards, and NLM was its first major commercial account. Thus, health sciences libraries and the health professions were beneficiaries of telecommunications technology right from the start. However, the universal availability of medical literature and literature searching for the same low fee in all parts of the United States was by no means inevitable. That it became so is commendably democratic, but I warn the audience that constant vigilance is the price of this liberty. Forces are arrayed to "save the people money" by

taking away such grand achievements and urging us to price communications costs separate from the information costs.

NETWORKING HEALTH SCIENCES LIBRARIES

Time does not permit a full summary now of that remarkable institution, the National Network of Libraries of Medicine (NN/LM), and its predecessor organization, the Regional Medical Library Network. Suffice it to say that the spirit of voluntary cooperation and helpfulness within the library and the medical communities permitted the work of NLM to be fruitful. The human network, in other words, preceded the electronic network—as it always must if useful services are to result.

Even so, the NN/LM, with its thousands of institutional members (and locations of holdings) and its connections to hundreds of document delivery arrangements, and NLM's score of overseas partners might have been viewed by the average library user as overly complex, even forbidding. That it by and large is not viewed in this way is a tribute to the professional skill of health sciences librarians. NLM systems help, but always to facilitate voluntary sharing between persons and institutions that wish to share. That the vast majority of library users have no clue whatever that these elaborate infrastructural arrangements have been deployed on the reader's behalf is a tribute to good work and poor press agentry on the part of librarians.

One aspect of this lamentable modesty was— strangely enough—the hesitancy of some health sciences librarians to rally round the concept of end-user searching. The librarian's role as an expert could best be demonstrated by teaching searching to willing students. As opposed to the role of the silent, competent search intermediary, such public displays of helpful proficiency could enhance the profession's image in the eyes of all. One library authority opposed end-user searching via NLM tools on the mistaken grounds that the librarians would demean rather than elevate their positions.

THE INTERNET

What actually has happened since 1989, when the Internet began in the United States, and especially since 1992, when the HPCC program became operational, is just about the opposite of what was predicted by the "anti–end user" theorists. The astounding increase in the number of U.S. and worldwide online users has been matched by an increase in the number of online knowledge sources, computer centers, and network service providers. It is certainly obvious to this audience that some of this seeming

profusion is due to gross repetition of offerings, a great many derivative offerings (for instance, the scores of products that actually are watered-down MEDLINE files), and the fact that many knowledge sources have not been kept up to date after their initial emergence. The nonlibrarian users also are getting this picture. Guess what is now demanded! Organization, indexing, order on the Internet! The world is looking for librarians—modern librarians.

And guess what else: all the old temptations are coming to life again; this time, in cyberspace.

■ Legislation is billowing up to call for monitoring of the electronic reading room.
■ No obscenity is needed; someone should purge it.
■ Some of the Internet sources are not current; someone should update them.
■ Some of the claims made are not truthful; someone should correct this.
■ Other material might be truthful but not suitable for youthful eyes and ears.

What are we to make of these demands? My view is that the electronic world of the Internet is the natural environment for the health sciences librarian. The more users of these information sources the better. Outreach to underserved users and to populations not optimally connected will continue to be a high priority for NLM and, I sincerely hope, for all health sciences librarians.

These are the real needs. These and the increasing challenges to facilitate all uses of information for discovery should occupy our days and gratify our concerns for work and for relevance. We should be deaf to the calls for librarians and other information professionals to police and censor the electronic networks.

Do you think I exaggerate? I will read you an example from the 1995 Essen University Conference on the "Information Highway: The Role of Librarians, Information Scientists, and Intermediaries." After reference to the burgeoning Internet, we find the following:

Acting as screeners of this information, to make sure that the "good" material gets through and that the irrelevant never bothers the client, will require a new profession of information "traffic policemen," individuals who can be respected and trusted. Someone will certainly fill that role. By preparation and experience, it should be librarians . . . [1].

Fortunately, in the proceedings of the very same conference is a most encouraging statement from a modern nonmedical library: the Massachussetts Institute of Technology (MIT). It literally takes the form of a credo:

■ We believe access to information should be free and unimpeded and not subject to censorship.

■ Access to information should be ubiquitous, easy, and satisfying.
■ Consumers are the appropriate judges of the value of information [2].

For me, this is a much more satisfactory world view, or *Weltanschauung*.

The question of the role of librarians in the electronic future naturally occupies our thinking. No doubt this is an area in which reasonable people may differ. I think we should make explicit and conscious choices about these possible roles; we should not respond using the old arguments or out of pique that things nowadays can be confusing and frustrating. A recent article from the *Chronicle of Higher Education* may illustrate what I mean. A librarian from Columbia University was interviewed about the weighty matter of the Internet and its relationship to librarians. The librarian, David Magier, apparently had earned the reader's attention by his scholarly work in organizing the part of Internet sources that related to South Asian studies. The conclusion conveyed by the writer as a result of the interview, however, was not the cheery message, "Let each of us scholars put our shoulder to the wheel." "Ideally," Mr. Magier says, "the entire Internet should be the focus of a coordinated project to impose some structure and standards on its content" [3].

My own view is that such an approach would be inappropriate. Of course, we all recognize that the Internet is an intellectual Wild West. To be sure, the quality of some data is suspect. Nevertheless, I would argue that this might well turn out to be the most intellectually productive time for our country since young Tom Jefferson was appalled and excited by Patrick Henry's remarks on treason. That was a day in 1765 in the Virginia House of Burgesses when the quality-control filter (as we would call it today) failed to operate. We don't really understand yet why those early years of the country were so intellectually fruitful, but it certainly had to do with open communication among thinkers in the American colonies. News and ideas traveled remarkably rapidly and freely in those days. In many respects, the most far-reaching move our forefathers made was the creation of public presses on this side of the Atlantic.

In any event, it does seem that one result of the current Internet frenzy is much quite-unexpected and valuable innovation. Let's not choose this moment to close down progress. And let's array libraries and librarians on the side of the innovators, not the regulators.

The experimental approach embodied in the HPCC Digital Library projects seems to me a better model. Here, the National Science Foundation, the National Aeronautics and Space Administration, and the Advanced Research Projects Agency have jointly funded

research into separable aspects—or special foci—at leading libraries and consortia, selected through competitive research proposals. Many of the problems of our future digital libraries are only dimly glimpsed now. It is regrettable that health sciences libraries were not included in this legislation and appropriation; conceivably, we may be able to join in future years. Nonetheless, I was pleased to note that some of the major scholarly digital libraries in this program share some fundamental conceptual problems with NLM and advanced health sciences libraries. An example that surprised me entirely is the difficulty of organizing the geographic collection of charts and maps at the University of California's Santa Barbara campus and the similar problems encountered in working with the Visible Human data set. Another problem for the modern librarian's knowledge and skills.

THE MODERN LIBRARIAN

As the public and scientists return to the library, they seek the modern librarian. In order to stay "modern," each of us needs a concerted self-improvement program that includes time at work and time off from work for education. Many employers are resistant to these ideas. Colleges and medical schools tend to be semi-reasonable about the ideas. The federal government is surprisingly unreceptive and uninformed. They tend strongly to view employee education as a benefit conferred—and pretty much of a suspect and unreasonable personal benefit—rather than as an investment for the future. At NLM, we have been asking all divisions for the past three years to budget formally to support education for their employees.

I personally place much more faith in courses at universities and colleges than in commercial training, because the employee has a better chance of accruing negotiable credit toward professional advancement or even a better job with another employer. But many schools have only recently begun to develop flexibility in their schedules and arrangements for adult learners. Hence, most opportunities for short courses of learning in modern librarianship (if you will pardon this formulation) actually occur under the auspices of the Medical Library Association (MLA) and other professional associations. Whether the future will see collaboration between MLA and universities, only time will tell. I hope so. Likewise, the future of the newest college ventures into network-based learning is hard to predict. I have not personally seen any international ventures in "teaching at a distance," but it is hard to imagine that any business opportunity will go unexploited. Unless some of the adult-learning ventures succeed, the recent rediscovery of the modern library and the earnest quest for

the modern librarian will be of no avail. After all, in this setting, we can surely acknowledge that the modern librarian is exactly right here. We—I'd better say "you"—are the modern librarians. There is no time for anyone else to play that role. The people who will run the modern library of fifteen or twenty years from now have already been trained and graduated. More will come, one hopes, but, for the next couple of decades, you are it. Our mental model of the modern health sciences library is the critical element in planning for the future. No one of course can state unfailingly what the long-term future will be, but the broad features of the modern library's evolution during the next ten years do seem somewhat more clear. First, we are all told repeatedly that information is much more than bibliographical citations. Few here will find this news alarming. Indeed, much of the online information even at NLM already consists of factual databases. On the other hand, getting medical users—or even skilled librarians—to love complex information sources, such as those in toxicology, has proven difficult. Nevertheless, most of us do accept that medical information will increasingly be computer accessible *ab initio* and will be sought by users of libraries via network connections [4]. Second, when considering our future libraries and future librarians, one wishes that all those who tell librarians so condescendingly about the need for full-text information could eventually understand that computer information nowadays—especially biomedical information—comes wrapped within or packaged integrally with data-format standards, database structures, controlled vocabularies [5], and retrieval software. Not everything is as simple as ASCII text of articles or fax-like, bit-mapped page images. Obtaining such information is easy; the only problem there is finding ransom money for the copyrighted texts. Beyond simple page images, however, important information comes with its own difficulties even when it is cost-free. What good, for example, would 150 million nucleotide sequences be without the software to search and compare them? What good would the 15 billion bytes of Visible Human data set be without segmenting or scanning software? In these "modern" situations, more sophistication will be expected both of the user of the information and of the librarian who arranges for it. In this respect, the modern library will be ever more interesting.

Yesterday, I had to miss the morning session to attend a meeting at the Library of Congress concerning the U.S. participation in the next G7 conference. Paul Peters made an interesting distinction between "digital libraries" and "digitized libraries." In this view, the Library of Congress' projects to scan 5 million documents by 2002 will produce merely a "digitized library"; whereas, the Visible Human is inherently digital and a kind of child of the Internet from

birth. Library users will increasingly be more so-phisticated—to some extent, preprogrammed like the sequence information. This is true of the general pop-ulation, too. Families and patients can utilize—and deserve—good and easy access to medical informa-tion. I won't elaborate on this point. Many health sciences librarians are out ahead of NLM already in serving the public directly.

An additional point should be noted. Even NLM sees changes in the nature as well as the quantity of public databases expected of us. I'll mention two ex-amples. The U.S. Congress recently required of us and of other National Institutes of Health (NIH) com-ponents that we try to do something about the need for a database of clinical trials, starting with those concerning diseases of women. We are beginning with those sponsored by NIH itself. The real issue here is not data processing, let alone computer science; it is medical and scientific management, in the usual sense. This kind of responsibility, I believe, will increas-ingly in the future be expected of the modern li-brarian in the modern library.

The second congressionally requested database concerns "orphan diseases." It, too, is distinctly a management problem and one in which any library would need strong medical partners. In addition to scientific literature and clinical-trials information and lists of relevant groups and associations, the patient support groups actually want what amounts to a "reg-istry" function. The file would include the names and addresses of those afflicted patients and families who want to be available for possible future clinical trials. This is another example of the increasingly close re-lationship between medical literature and medical libraries, on the one hand, and medical records and patient information on the other. Jana Bradley spoke very well to exactly this point in her Janet Doe lecture yesterday [6].

The broadened future role of health sciences li-brarians within the health sciences center is ad-dressed by the NLM plan on the *Education and Training of Health Science Librarians.* In addition, the plan fo-cuses attention on the need to recruit to the profession more persons from minority communities, the op-portunities for advances in university graduate ed-ucation of librarians, and the great need for increas-ing opportunities for adult learning in health sciences librarianship and related informatics fields. NLM will institute a follow-on "challenge grants" program in these four areas. We hope excellent proposals will be submitted and that other persons, associations, agen-cies, and foundations will make common cause with health sciences librarians in solving these challeng-ing problems.

In closing, I thank you for the chance to participate in this historic 7th International Congress on Medical Librarianship. The future certainly beckons us en-couragingly. I have every confidence in this group and this profession. Best of luck in all that you un-dertake.

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