



**Editor's Note:** NORTH CAROLINA LIBRARIES rarely reprints speeches or addresses. We are making an exception in this case because we feel Walt Crawford has dealt with issues of major importance to North Carolina Librarianship. "Moving Toward Extended Libraries: Sensible Futures" was originally prepared for and delivered at the Librarians' Association at the UNC-CH 1995 Spring Conference, "The Changing Landscape of Information Services." Some of this material also appears in the book *Future Libraries: Dreams, Madness, and Reality* by Walt Crawford and Michael Gorman, ALA Editions, 1995.

## Moving Toward Extended Libraries: Sensible Futures

Walt Crawford

Keynote for North Carolina Center for Independent Higher Education Conference,  
"Through the Star Gate"  
October 25, 1995

**I**t is a pleasure and an honor to be here this morning, to kick off what should be an interesting day for all of us. While libraries, particularly public libraries, are much more than information services, such services are key parts of what you do — and it is certainly true that the landscape is changing. Then again, that conference title could have been used twenty years ago or forty years ago, and it will work in another twenty or forty years as well. The library field is changing and will continue to change, just as it has been changing for at least the last century. I am not convinced that today's changes are revolutionary or somehow uniquely disruptive; indeed, I believe that sensible libraries will continue to evolve.

I began to speak about library futures because I was reading a surprising amount of nonsense about virtual libraries, the death of print, the electrosphere, and other technophilia — and, to be sure, because a group within the Arizona State Library Association invited me to speak and didn't have a set topic. That was in the fall of 1992. A series of related speeches and papers has followed, causing me to do more research and thinking on these issues and leading to the book *Future Libraries: Dreams, Madness, and Reality*, by Walt Crawford and Michael Gorman, just published by ALA Editions. In the process of preparing the speeches and co-authoring the book, I found that the madness of an all-digital library future in which only packets of information matter goes back more than twenty years. I believe that this madness is now

being seen for what it is, and hope that we can move beyond it in order to keep improving libraries and library services.

My title today is "Moving Toward Extended Libraries: Sensible Futures." Every word is there for a reason. We must think in terms of movement rather than either revolutionary change or a fixed goal; libraries must continue to move. We continue to move toward goals, but those goals continue to evolve over time: thus, we can expect to move toward, but we will never arrive at, a resting place.

The key words are *extended* and *libraries*. Future libraries will offer extended access and extended services, but will not become virtual libraries — and the plural, libraries, is critical, as no single model best serves all libraries.

Finally, *sensible futures*. I believe in common sense, uncommon though it may be. I do not believe that self-proclaimed futurists have some special power or claim upon the future. As far as I can tell, I am now a certified professional futurist: that is, I have been paid more than once to offer projections for the future, and have published a book about the future. You should have exactly the same faith in me that you should have in any other futurist: which is to say, very little faith — if what I say conflicts with the facts as you explore them and people's desires as you understand them. I hope to avoid the word "inevitable" in this presentation, as it is a red flag, meaning that the case being argued is not strong enough to stand on its merits. Death appears inevitable; otherwise, there is precious little that de-

serves that term. And there is not one future for libraries; there are many futures, depending largely on how we go about building those futures.

### *Heart of the Campus, Soul of the City*

In case you missed the December 1994 *American Libraries*, I must quote an almost-alumnus of the University of North Carolina at Chapel Hill, Shelby Foote. When he was visiting Wilson Library recently, he was reminded that, as he says, "A university is just a group of buildings gathered around a library. The library is the university."<sup>1</sup>

A good library is the heart of every campus and the soul of every city. That is neither dreamy romanticism nor metaphor; it is a simple statement of fact. A campus without a good library at its heart is an extension center, not a college or university. Libraries, as both places and service centers, are vital to our campuses and cities. Let's look at their futures—how some of the nonsensical projections come about, and some aspects of realistic movement toward extended libraries.

This talk has four sections. First, getting past the hype — disposing of some of the myths and dystopian projections for the future, and understanding the enemies of libraries. Second, coping with new technologies: some of the problems and some of the promises, with reasons that some caution on new technologies makes sense. Third, building from strength: recognizing the importance of today's libraries, building the output numbers to make the case for

academic libraries, and appreciating the need for solid print and media collections as the bases for extended libraries. Finally, moving toward extended libraries: a few notes on steps toward sensible futures.

## Getting Past the Hype

Let's talk about getting past the hype—coping with some mythical futures and understanding how those myths arise. We need to look at terminology, which does matter, and to be sensitive to those who would harm libraries either intentionally or accidentally. I'd like to touch on a few myths and dangers: the virtual library and universal workstation, the death of print, and disintermediation. Along the way, some notes on technolust and the importance of terminology may be in order.

### *The Myth of the Virtual Library & Universal Workstation*

What is a virtual library? Here are two definitions that I regard as mythical and dystopian:

A university's virtual library is a situation in which everything a user wants or needs is displayed on his or her scholar's workstation in an office, lab, or dorm room. There is no physical library and no physical collection. The scholar's workstation meets all of the user's library-related needs and information requirements.

A virtual library of any other sort is a combination of electronic organization, access mechanisms and electronic linkages that serves all the functions currently served by a traditional library at least as well as a traditional library, without involving a physical library or physical collection.

The universal scholar's workstation just isn't going to happen, for economic and other reasons. With the possible exception of a few corporate-library situations, I believe that the second case is also impossible without impoverishing the meaning of "library." One thing should be obvious for both definitions, at least when budgetary realities are applied: the virtual library will not employ librarians, either as currently defined or with nonsense titles such as "cybrarian" or "information specialist."

Not everything is in electronic form. Many things never will be, particularly while they are protected by copyright. Just because something isn't available electronically doesn't make it unimportant, except to the truly devoted elec-

tronic publishing enthusiasts. Even setting aside copyright issues and problems of adequate reading devices, conversion of print material is a slow and expensive proposition, particularly if you accept the idea that everything in print publications matters: not just the text in a *PC Magazine* or *New Yorker* or *Book of Hours* but also the typography, layout, illustrations and ads, where they exist. Without going into extended discussion, economic realities suggest that the most ambitious program of digitization will not even keep up with new printed publications, much less prepare the universal digital library.

Perhaps the most bizarre aspect of the push for electronic everything is that it's apparently a case of telling the users what they need, even though it's not what they want. As noted in the RLG report *Preferred Futures for Libraries*, "when push comes to shove, faculty want materials on campus. They don't want to be dependent on other distant libraries for needed materials. Many of them also, because of the structure of their disciplines, still depend on at-the-shelf browsing. Efforts by librarians to de-emphasize ownership are interpreted as a failure to understand both the political environment and legitimate differences in research methodologies among disciplines."

Somehow, however, we apparently know better. Or do we? As Steven Kirby (University of Georgia) said in a March 3, 1992 PACS-L message: "Faculty and advanced graduate students at research universities are the most likely beneficiaries of the virtual library. This is the group that most often makes use of obscure, possibly expensive, and seldom used materials. And if the prime beneficiaries have reservations about the benefits of the virtual library, then who are we building it for?" Who indeed?

### *The Life of Print*

For years, we were hearing assertions that print is dying, the book is obsolete, everything that matters will be digital in a few years, and this is a good thing in every respect. Curiously, every available fact says that the book is not dead, it isn't dying, and it isn't even feeling poorly.

One of the sillier cases for an all-electronic future is the idea that we'll do all our reading from computer devices. While this isn't impossible, it's extremely unlikely. The fact is that books work — as do magazines and newspapers. Not for everything, to be sure, but for many things. Books represent a highly refined technology, developed over several hundred years and made

more cost-effective and timely by today's computer technology.

Right now, no electronic medium can *begin* to compare with ink on paper for readability, even if we discard the pleasure of the book or magazine itself as a factor. The readability problems are not being solved as rapidly as you might believe. Some may not be solvable. I won't go through the major problems in detail, although I'd be delighted to discuss them; briefly, they are light, resolution, speed, and impact.

The point is not that we should just wait a few years and all these problems will be solved. Some of them will be; others won't. The point is that we have a first-rate medium for extended reading: ink on paper. Until electronic media perform *at least as well*, there is no reason to discuss displacement of non-reference, widely-circulated print material. Why give up something that works for something that doesn't?

Perhaps the most curious aspect of predictions of the death of print is that they come at a time when print publishing is growing, not shrinking. Print publishing as a whole is not in trouble. It is a \$75 billion a year industry (in the United States), and it is a growing industry.

Those who advocate an all-electronic future claim that it will be cheaper and save paper. Advocates of virtual libraries deride academic libraries as expensive buildings full of dead trees that nobody wants. These claims don't stand up to scrutiny. For public libraries, the ecological and economic impact of print-on-demand as a total solution would be devastating; for academic libraries, it would simply be fatal. What do I mean by devastating for public libraries? My rough calculations suggest that printing on demand in North Carolina public libraries would generate some six to nine times as much paper each year as is stored in their collections, and would cost—for printing and electronic distribution alone—some five times as much as the entire budget of the state's public libraries. As for academic libraries, more detailed discussion appears in *Future Libraries*; for now, it may be enough to say that replicating the existing use of, say, UCLA through totally digitized print-on-demand services would generate as much paper each year as is in UCLA's entire collection—and that the cost of such printing alone would devour much more than UCLA's entire current budget.

### *Disintermediation*

We hear from library futurists that refer-



ence librarianship is dying. In the all-electronic future, every user will be his or her own reference librarian. This is a remarkable assertion, particularly coming from within the library profession. It represents a sort of self-hatred that becomes suicidal.

I'm all in favor of bibliographic instruction. Of course college students need to have research skills. Certainly some people will make more direct use of reference sources in the future, bypassing the library — not that there's anything new about people getting information directly!

But what some librarians seem to call for is the *end* of reference librarianship: that *every* user in *every* library should be handling all of his or her own research work. There are at least two fundamental flaws in this position:

It assumes that reference librarianship is not only not a profession, it is no more specialized a skill than is driving a car or reading a bus schedule. That assumption devalues one of librarianship's most valuable aspects, and equates professional librarians with clerks.

It assumes that ordinary library users have some reason to build and maintain research skills strong enough to eliminate the need for reference librarians. Why should they? For most people, detailed reference work is not an everyday act. Even if most adults could learn to do most of their own car repair, plumbing, and electrical work — not a safe assumption, to be sure — why on earth would they?

Somehow I can't imagine plumbers or electricians giving speeches in favor of disintermediation — the desirability of training everybody to do their own plumbing or electrical work. Is reference librarianship so much less specialized and valuable than plumbing and electrical work?

I believe reference librarianship will be even more important in the future, as libraries attempt to add the chaotic resources of the Internet and other electronic distribution systems to their more orderly existing collections. The skills needed to turn a user's direct question into the user's actual requirements, the knowledge of where the best tools to meet those requirements might be and how to get at them, and the awareness of which tools are most appropriate and most reliable, will be even more important in the future than they are today — and they will continue to be professional skills.

### **Technolust and its Consequences**

Let's talk about a disease that leads people to get caught up in the idea of an all-electronic future: technolust. At its root, technolust is either an excessive fascination with the newest toys or an excessive faith in the new. It is healthy to keep up with developments in technology and information, but that's not technolust.

Folks with technolust look at growth rates for the first year of a new technology and project the same percentage rates for the long term, leading to absurdities such as John Sculley's supposed prediction of a \$13 trillion market for multimedia and personal electronics by the end of the decade, and projected annual PC sales in excess of population size.

Technolust assumes that the new is always better than the old, and that what's in the lab must be better than what just hit the market. The kind word is early adopters. The realistic word is technojunkies. Some technojunkies say that technology is a lifestyle, whatever that might mean — and those technojunkies regard books and libraries as archaic.

Victims of technolust assume that every new device will succeed, and succeed brilliantly. Market analysts of the technolust persuasion assured us four years ago that by now tens of millions of us would have CD-I or CD-V or VIS or some other CD-based system attached to our TV sets — and they still talk about the soon-to-explode home computing market, and claim there will be 2.5 computers in every household by 1997.

There is a special kind of technolust typified by Internet junkies: the preference for virtual reality over — well, reality. People who would rather read text on a screen than in a book, simply because it's on the screen. People who assume that a periodic table available over the Internet must be right — after all, it's on The Net, even if some of the symbols are wrong and it seems to be missing a couple of dozen elements. People who send out questions and assume that whatever answers they get must be correct (they're from The Net). I find that variety of technolust most difficult to deal with. It seems to be a kind that blinds its victims to reality in general. It also blinds its victims to economic realities. Because their use of the Internet is subsidized by a university, they assume that "the Internet is free" — and they assert that all information should be free, or at least free to them.

One suggestion I have for those suf-

fering from technolust is to get out more. Shut down that computer and take a walk. Take lots of walks. Take a vacation, preferably without your computer. Talk to real people. Try a little non-virtual reality.

Another suggestion is to repeat that computers are only tools — that technology, in general, only produces better tools. People are still the tool-users; without thought and creativity, the best tools in the world are not only useless but dangerous.

And be aware that life isn't simple, that the new doesn't automatically supersede the old, and that most new devices and technologies fail. We'll get back to that last point a little later.

### **Why Terminology Matters**

I need to say a few words about words. I've argued strenuously that the term *virtual library* is dangerous, and that if you mean extended library, that's what you should say. I admire the work being done at Cornell University's Mann Library toward building digital collections, but abhor the term "electronic library" used in conjunction with those efforts. I applaud the Library of Congress efforts to build significant digital collections, to make some of its unique resources available in ways that can best be achieved through digitization—but I would far prefer to see these efforts described as building digital collections (which they are), not building the digital library (which they are not).

Words matter. The wrong words can be used as clubs by those who want your money and your space. Terms such as virtual library, electronic library, digital library all imply libraries that don't need new buildings and can dispense with collection development—and, to be sure, with all those expensive non-virtual librarians. The wrong words disappoint, as valuable but limited efforts fail to achieve goals that appear implicit from the words, even if never assumed by the speakers.

Words matter, perhaps most of all, because of the new barbarians, those who would undermine library collections and services in the name of the all-digital future and inevitable progress.

### **Integrating New Technologies**

But enough of that. I'd like to talk about new technologies and the problems of integrating them into operations. I found a recent *San Francisco Examiner* article particularly amusing, as it discussed some real-world cases where early adopters had recognized the pointlessness of certain technologies. In one case, a person

decided to scrap their \$300 electronic organizer for a small paper notebook; that same person also stopped using his PDA because it was more trouble than it was worth. The amusing part is that the reporter called this person a neo-Luddite: a truly bizarre term to use for someone whose technolust had achieved partial remission.

Libraries have been integrating new technologies and new media for decades, and have been leaders in sensible use of new technologies. The first commercial CD-ROM was a library product. Until recently, more than a decade after that CD-ROM was published, libraries were probably the most important market for CD-ROMs.

### ***Spotting Nonsense & Rewarding Dreams***

We don't lack for dreams of the future, and that's a good thing. Unfortunately, many of today's writers and speakers seem to confuse dreams and reality. More to the point, many of today's futurists demand our support in realizing simplistic dreams that, when viewed rationally, appear not only unrealistic but quite undesirable. These people tell us that we must either sign up for their future or get out of the way, that what they describe is not only feasible but inevitable, and that there is no standing in the way of progress.

In one rather narrow sense, they're right. If you hate change, you won't be happy in the library profession for the next few decades—but then, how have you survived the past three decades? Of course we will see major changes in libraries, librarianship and the uses of information technology. How could it be otherwise? I can't project just which changes will occur when, and which won't really happen at all—and, I will argue, neither can the dreamers and futurists.

One of the longest-lasting dreams was Tedd Nelson's Project Xanadu. Nelson has been both visionary and crank. He invented hypertext more than two decades ago—but took this useful, if limited, idea much too far. Project Xanadu is hypertext gone global: a worldwide network containing everything ever written and everything that ever will be written, all linked from paragraph to paragraph, idea to idea, video clip to audio montage, in any way you could imagine. You go to an information kiosk, slide your credit card through the slot, and use the most wonderful navigation tools to find all the information you could ever want and make all the intellectual links and leaps that will make all

that information more worthwhile. Oh, and authors are protected—not in terms of the intellectual integrity of their work, since that tends to disappear in this global hypertext universe, but in terms of royalties: every time you touch a new paragraph, some payment is credited to the author's account.

Why, it's all so wonderful, with ideas building on ideas, paragraphs leading to paragraphs, making connections from here to there, finding everything you never knew existed—how could boring old books and print possibly survive in the face of such competition? Incidentally, reading Tedd Nelson's books might help you to understand his attitude toward linear text: it was never his strength. For years, Project Xanadu was touted as a certain winner, about to emerge into commercial production any day now. Autodesk was funding it, and it was just a matter of time. Well, Autodesk spun it off, and it appears to have gone into a well-deserved oblivion.

Those of you who deal with Internet/BITNET can hardly have escaped mention of Project Gutenberg. I can't decide whether Michael Hart is a dreamer, an expert at self-aggrandizement, or simply a curiously benign con artist. Hart's consistent use of incredibly misleading statistics makes it difficult to take the benign view, particularly since Hart consistently proclaims that physical libraries are irrelevant, and that librarians should make their livings as 900-number on-call information consultants. Hart's goal, repeated over and over again in a multiyear drumbeat of publicity printed by a remarkable number of gullible journalists, is to give away one trillion book equivalents by 2001. One trillion! Hot stuff! In mid-1992, Hart proclaimed that the project had already given away 2.6 billion e-texts, a quite remarkable number.

Let's look at that claim. At that point, Project Gutenberg had posted 26 electronic texts. The project asserts that by the year 2001, some hundred million people will have access to the Internet. Multiply 100 million by 26 and you get 2.6 billion. Which is where the one trillion comes from: PG hopes to have 10 thousand e-texts by the time it ends.

This is great stuff. I can go Project Gutenberg one better, using exactly the same logic. Namely, RLG has already given away 80 quadrillion bibliographic records—that is, 80,000 trillion! Isn't that wonderful? And it's equally true. Through our WorldWideWeb home page and separate eureka-info.stanford.edu Internet node, we offer real Eureka search sessions, rotating access to different files on

a weekly basis. Those files include some 80 million bibliographic records. Multiply 80 million by 100 million and, presto chango...RLG is the greatest benefactor in the history of the Internet! 80 quadrillion: what a wonderful number! That's more than a million records for every person on earth. And that claim is just precisely as legitimate as Project Gutenberg's 2.6 billion: not a whit more or less.

I could offer more examples, but they get depressing. Many dreams are worthwhile, but dreamers have a tendency to ignore the real world.

### ***Most New Technologies Fail***

Here's an unnerving thought, when you're deciding how far out in front you should be on new media and other innovations. Most innovations fail. Sometimes before really penetrating the market; sometimes after a short blaze of glory. There's no sure way to predict which will fail and which will succeed—and, much as I hate to say it, you can't wait out all of the likely failures.

Remember eight-track tapes? That was one of those blaze-of-glory situations (or, if you know how eight-track tapes actually worked, blaze of infamy: the technology was fatally flawed from the beginning). Then there were the half-dozen or more videocassette systems that were introduced, and failed, before Sony's Betamax made videorecording popular. Betamax has moved from the personal to the professional market—but it had more than a decade of reasonable consumer-market success. Still, I bet some libraries got involved with Cartrivision, or SelectaVision, or V-Cord—and lots of libraries (and others) still use U-matic tapes.

Then there are videodisks, only now just beginning to succeed in the consumer market, and then only thanks to CD players. The number of failed videodisk systems is astonishing, dating back to 1928 and pretty much ending in 1984, when RCA finally abandoned their wretched CED system.

The list goes on. Libraries have had more than their share of failed micromedia, including ultrafiche, aperture cards and various micro-opaque systems. Would anybody care to guess how many incompatible personal computer systems came and went over the past two decades—and how many semi-compatible systems are still out there? I wouldn't, but the number is depressingly large.

New electronic publishing media? Well, of course, CD-ROM is an overnight success. The standards were established in 1983, the first products came out in



1984, and predictions of massive marketplace success have been common since 1987 or 1988. Compared to some other technologies, CD-ROM is doing great. Ever hear of OROM, Optical Read Only Memory? 3M announced it in the early 1980s; IBM was involved; it offered much faster access than CD-ROM, with similar capacity; and in 1988, I thought it might be nearing the marketplace. Similarly, Sony's DataROM — which may, for all I know, have mutated into Sony's miniature CD-ROM for the Data Discman. How about Cauzin Data Strips: a big deal for a year or two, with PC World and Library Hi Tech News actively publishing the strips — but long since disappeared.

Compact Disc Interactive? It's been in the works since 1986; it's on the market now, with what appears to be tepid success at best. Compact Disc Video: also around since 1987 or so, but basically a dead duck. Digital Video Interactive, announced by RCA in 1987; unclear what's happening. Drexel's LaserCard, in use for niche applications for several years, with no breakout apparent. And we can't forget "digital paper"—the hot new medium that's been coming any day now for at least half a decade.

Why mention all these failures, only a few of the many? Because librarians have been urged to use almost every one of these media, before it's too late and their libraries become irrelevant—and some have. What does the library do after the technology disappears? In practice, one of two things happens: either the materials (some of which may be unique) become inaccessible, or the library—some library—becomes a museum of failed technology, all of it lovingly maintained so that the resources are available. We will continue to need some such museums, but it would be good to avoid adding too many new systems to their collections.

### **Old Technologies Survive**

Not only do most new technologies fail, but old technologies rarely disappear as rapidly as predicted. Technojunkies of a decade ago assured us that CRTs would be long-gone by now — and continue to assure us that CRTs are on the way out, even though as of today an 11" 1,024-by-768 color LCD screen, while theoretically available, costs a cool \$12,000, as compared to \$900 for a first-rate 17-inch CRT with twice the display space and the same resolution. Actually, the imminent replacement of those old-fashioned vacuum tubes has been predicted for some two decades now. They are, to be

sure, silly and archaic in terms of general technological development — but they keep getting better, making a moving target for replacement technologies. If anything, the gap between CRTs and thin-screen devices seems to be growing. For that matter, the most promising new technology for thin-screen displays is CRT-based.

Speaking of dead ducks, consider hard disks. I saw several well-considered projections seven years back that showed solid-state memory, with its far superior speed and resistance to crashing, becoming cheaper than hard disks by now. That's true: RAM is now much cheaper than hard disk storage was seven years ago, and even the kind of stable RAM needed for solid-state disks is about where hard disks were seven years ago. But, of course, hard disks are a whole bunch cheaper and faster now than they were then. I can almost hear the engineers who have brought down the price of durable RAM: "Well, we made it for \$100/megabyte; what more do you want?" Hmm. Right now, PC hard disk storage sells for 40 to 65 cents per megabyte; that seems like a good target. A tough one, though. Oh, and today's hard disk drives are at least ten times as durable as those of a few years ago; indeed, it's now pretty rare for a contemporary disk drive to suffer a mechanical crash.

With relatively few exceptions, new technologies complement older ones, displacing them over time and to the extent that the new technologies offer clear advantages. When it comes to communications, that's particularly true. Print did not destroy the oral tradition, although it extended its reach. Radio news did not destroy newspapers. Even though television has apparently hurt newspaper circulation to some extent, there are still many profitable newspapers. Neither did television destroy radio, which is more popular now than ever—although it did change radio's direction. Television and home video surely changed the motion picture business—but in complex ways still not fully understood, and ways that have not destroyed the motion picture industry by any means.

Some will bring up Compact Discs as a case showing that new technology can totally displace an older one quite rapidly. This is an exception, and the premise is faulty. Vinyl discs were already being displaced by audiocassettes. Vinyl was a minority sound medium before CDs took over. More to the point, vinyl discs represented a fundamentally flawed technology. Every use of a vinyl

disc tends to destroy it, and you need exceptional care to make vinyl discs work well in the first place. People moved to audiocassettes not because they were higher quality (they offer significantly lower sound quality) but because cassettes are more portable, don't require such agonies of cleaning, anti-static treatment, etc., and don't deteriorate sonically as rapidly or dramatically as vinyl discs. CDs combine the convenience of cassettes with sound quality as good as or better than vinyl discs; they sound as good on the twentieth playing as on the first; and you don't need to be a tweak to get them set up properly.

If books, magazines and newspapers were as hard to use as vinyl discs, they would be ripe for the trashing—particularly if CD-ROM and electronic access were as straightforward as CDs. Neither is true; far from it.

### **Building from Strength**

Libraries, both public and academic, need to understand and publicize what they are now, in order to maintain support for extended libraries. You need to build from strength. That means building coalitions and publicizing achievements, but it also means being realistic about what libraries are and are not. Let's talk a little about public libraries and academic libraries.

#### **Public Libraries:**

##### **Not THE Information Place**

Most people don't rely on public libraries for the most current facts: that's what newspapers, television and radio are for. Most middle-class and upper-class people don't get their primary information in their key areas of interest from the public libraries: that's what personal magazine subscriptions, bookstores and online services are for. But most people — two-thirds of adults around the country — do use their public libraries for pleasure reading, adventures in new areas, and many other aspects of life. A good public library is not an InfoKiosk. It's a vital part of the community, one that electronics won't and can't replace.

Almost all public libraries offer bargain services, perhaps the best bargain of any public agency. Nationally, print collections circulate at an effective cost of around \$2 per circulation (1991/92 figures), even if you assume that all material costs and 60 percent of all other library costs should be allocated to circulating print. For North Carolina libraries in 1992/93, the average was less than \$1.50 per circulation. It shouldn't be that low, to be sure, but it is.

There is simply no way you can get that kind of bargain through other means, not if authors and editors are expected to eat, not if telecommunications companies are expected to operate, and particularly not if people want to read long text in print on paper. At the \$2 level, the discussion is over: it just can't be done. There don't seem to be well-reasoned figures for the full cost of providing book-length items, printed on demand, through a realistic electronic distribution system that respects copyright. I'm guessing that \$10-\$15 plus printing costs may be a realistic average, and I'll swear that \$5 plus printing costs is a minimum (thus making the actual cost of providing a 200-page book at least \$10). Either way, the costs are much higher than those of circulating print collections.

Different public libraries have different needs and different patrons, and serve different purposes. Major public libraries usually have some research collections and components. Some public libraries have substantial outreach and literacy programs; others struggle just to keep the doors open. Well-funded public libraries are able to do much more than badly-funded ones, which is hardly surprising.

#### **Funding America's Public Libraries:**

##### **A Dime a Day**

Libraries of the future should be aggressive libraries, making their cases for strong budgetary support. More people use libraries than almost any other public service, and libraries offer some of the most cost-effective service possible. That won't change, if libraries don't lose their way in ill-thought plunges into all-digital adventurism.

A dime a day (1990 figures, plus inflation): that's a good starting point for a truly robust library in an economically healthy area. In other words, \$36.50 per person per year, plus inflation. And, incidentally, a dime a day should be an average: the best public libraries, with the most support, will and should spend even more. My home-town library is funded at \$59 per capita; Berkeley's public library gets more than \$70 per capita, because Berkeliens love their public library and use it like crazy.

##### **Understanding Academic Libraries**

Academic libraries come in many categories. Junior college and community college libraries serve several kinds of students and communities. Small private humanities colleges have very different patron needs than either junior colleges or large research institutions.

Even among large institutions, there are differences between public and private, large and very large, ARL and next-level libraries.

One problem is common to almost all academic libraries as they attempt to get the kind of funding they need and deserve. That problem is lack of output measures, at least on a national scale. ARL doesn't gather or report any output measure except interlibrary loan transactions. Neither does ACRL, for the next-largest group of libraries.

When non-librarians, out to save a buck, and librarians who don't understand the functions of academic libraries come to sell you on the virtual library, they look at individual transactions. If a library doesn't measure what it's doing now, how can it predict the cost-effectiveness of doing it differently? If we don't have national figures as benchmarks, how do we know what's reasonable?

For almost every academic institution that does report output measures, the cost per transaction is lower than could be achieved by document delivery, print-on-demand, or other futuristic means, even if all library costs are allocated to output. Although in-house use is almost always unreported or badly under-reported, indications are that even

## **BROADFOOT'S OF WENDELL**

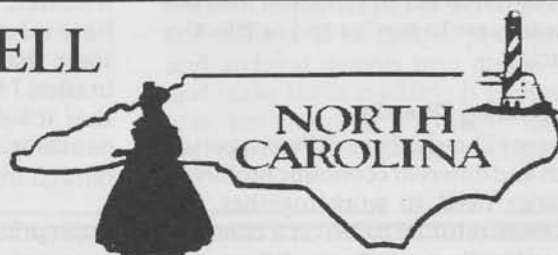
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the largest collections have healthy turnover rates — e.g., 32% for UCLA, 20% for Berkeley, but an average of 77% at California community college libraries.

Perhaps even more than public libraries, academic libraries must make their cases for appropriate funding. ARL finally admitted what some observers have suspected: library funding as a percentage of campus expenditures has been dropping for years, even as subscription costs and number of journals have been rising.

Academic libraries need to state their particular missions clearly, and those missions must involve the long-term needs of scholarship and the immediate needs of students and faculty. Academic librarians need to understand their users as well as their funding agencies. They need the clear and adamant support of those users in the face of administrators who see the library as overhead, rather than as a common underpinning for all academic life.

Academic libraries, and particularly the largest, most specialized institutions, will surely see more use of electronic distribution. With luck, university consortia and other means can be used to ameliorate the serials crisis that is specific to academic libraries. But these new tools cannot and will not replace print and collection development, at least not if libraries are to survive and be effective agencies.

### ***Appreciating Diversity***

Different libraries have different patron needs and different economic problems. Libraries need to work together, but that work must be based on a common understanding of those differences. Large academic libraries and the public libraries in the same cities should complement one another, not compete — but it is surely unreasonable to tell the public library that it should sacrifice its material acquisitions budget so that scientists at the university have better access to overpriced scholarly journals!

### ***Maintaining a Strong Print Foundation***

When we talk about electronic access and distribution, and other ways that technology can and should change tomorrow's libraries, we should be talking about extension, not replacement. Today, most libraries use contemporary technology to expand their on-site collections in ways that print cannot do as effectively. We will see more of that in the future — and we're beginning to see the next step, in which digital publications such as CD-ROMs become circulating items for advanced library users.

More and more libraries use networks to gain access to collections far in excess of what they can maintain in-house. In some cases, these extended collections represent print resources available after some delay, or available at some cost for rapid delivery. In other cases, these extended collections are available only (or primarily) in electronic form, retrieved on request from digital repositories that may be in-house or around the world. We can expect to see more of this as well.

Today, most good libraries provide a range of services that do not require patrons to come into the library itself. We can expect to see these services grow.

All these things extend the library, making it more effective. They do not, and will not, replace the physical library, the librarians, and the physical collection. It's not just that printed books and other printed materials will continue to be vital. It's also that the library as a service center, and as a way for the disadvantaged to gain access to information and enlightenment, serves functions that technology won't replace.

### ***Toward Extended Libraries***

The good news is that many libraries, groups of libraries, individuals within libraries, and related organizations have taken on some of the many small steps that will continue to extend libraries. I have no laundry list, but feel that it's useful to add some notes to consider while working toward extended libraries.

### ***Appropriate Technologies***

Electronic distribution should displace print in some areas, just as it has for many print indexes. When material is best dealt with on the single-line or single-paragraph level, when the body of stuff to be dealt with is enormous compared to the individual usefulness, then CD-ROM makes more sense than paper and online may be the best choice in some cases. Some other cases have been mentioned.

In general, however, we can assume that electronic distribution and digital publishing will complement print, making their marks as new media, just as each new medium has done in the past. *From Alice to Ocean* is a print book with accompanying CD-ROM (or, for technophiles, a CD-ROM with accompanying print book). The CD-ROM publisher that acquired rights to Randy Shilts' *Conduct Unbecoming* will release the text on CD-ROM, with full-text search capabilities, but the major point

of the CD-ROM will be video interviews with some of the people in the book — and the publisher regards the CD-ROM as a complement to the printed book, not a replacement. The CD-ROM version of *The Way Things Work* offers effective and delightful explanations that aren't possible in print: that's a case where CD-ROM is a clear winner.

Only the most fervid electronic enthusiasts and some doom-crying librarians still speak of electronic books as inevitable replacements for printed books. But then, some librarians asserted that print and libraries were doomed when TV came along, when radio came along, even when sound recording came along. Simplistic views are nothing new.

### ***Avoiding Overkill and Grand Solutions***

Let's talk a bit about grand solutions. One recent proposal would have ARL libraries establish a compulsory electronic distribution system for scholarly articles, and eliminate the purchase of commercial scholarly journals. This, it was posited, would replace the \$400 million per year being spent on such journals with a mere \$40 million per year. And, after all, aren't libraries just "buying back the scholarship that their campuses generate?"

The solution relates directly to that wonderful catch-phrase about buying back your own work — and that's not what's actually happening. According to *Science and Engineering Indicators*, only 22 to 45 percent of science papers come from the United States. According to one informed estimate, 90 percent of American R&D is done outside of campuses. Presumably many of those employed by someone other than universities and colleges also have worthwhile contributions to make.

If we assume that 30 percent of scholarly articles come from America, and that half of those articles come from academia, then perhaps 15 percent of what's in the international scholarly journals comes from American academia. And some sampling of such journals shows results right along those lines: 6 to 15 percent of the papers came from American colleges and universities.

Will scholars at American universities give up the other 85 percent of the papers? Should they? Will they tolerate being locked out of those journals? Should they? If not, then this grand solution adds another \$40 million to the \$400 million, saving not a dime.

I won't bore you with the antitrust issues that would be raised if American universities took the incredibly concerted efforts that would be required. Yes, anti-

trust law does apply to nonprofit institutions, as a number of private colleges have learned. Concerted action in restraint of trade is illegal, and this universal academic takeover is quite clearly such concerted action. The plan would be tied up in courts for years, and it's exceedingly unlikely that universities could win the case.

Yes, I want to see universities and libraries more actively involved as publishers, either in print or digital form. Some pressure must be exerted on the oligopoly of international STM publishers. Despite the most persuasive arguments for the pricing policies of these publishers, I think there's a convincing case that many price and publishing decisions are arbitrary and assume a captive market.

I believe there are real potentials for universities to create new journals, in print or electronic form, edited by top scholars in the field and attracting the best papers away from overpriced commercial journals. That's a slow process, but it has the advantages of being legal and plausible. In the long run, it could save libraries some money.

#### *"Loosely-Coupled Scholarship"*

As far as wholesale action in this regard, there are several catches. Charles A. Schwartz of Rice University wrote a thoughtful, well-researched and, I believe, fairly conclusive paper, appearing in *College & Research Libraries*, March 1994 issue: "Scholarly Communication as a Loosely Coupled System: Reassessing Prospects for Structural Reform." His conclusion? "Prospects for restructuring the scholarly communication system are nil." I commend the article to you. While not pessimistic, Schwartz is realistic and convincing. He calls for incremental exploration, a call that I would enthusiastically second. Libraries and universities should work to improve the STM situation, but set aside the grand scenarios; they just won't work.

Any grand solution must be thought through in its entirety. There are precious few island universes out there. In practice, any grand solution is likely to be useless. Meanwhile, small initiatives such as Eric Lease Morgan's work at NCSU appear to offer real possibilities for increasing the limited role that electronic journals will play, and integrating those journals into mainstream library operations. This is one of the many little efforts that is likely to yield more fruit than Grand National Solutions.

#### *Many Solutions to Many Problems*

You need to think through the futures

and solutions that are proposed, whether they are my projections or those of the all-electronic advocates. When considering proposed solutions, I would suggest a few cautionary measures:

First, try to find specific solutions for specific problems. Some solutions can indeed be generalized — but the more you generalize a solution, the more likely it is that you're solving the wrong problem.

Second, look at the implications of a solution, both short-term and long-term, and recognize that you can't accurately predict all the long-term implications. Keep track of them: has the solution of five years ago started to become its own problem? Think things through before attempting a solution, and keep thinking about the impact of the solution.

Third, think in terms of multiple solutions, not one massive agenda that succeeds or fails.

Fourth, recognize that the future grows out of the present, and that the future will certainly be at least as complex as the present. When predictions call for futures that are simpler than the present, ask yourself how such grand clarification could occur without economic devastation?

Finally, and most importantly, don't accept the word "inevitable" and don't let anyone tell you that something that seems undesirable is

going to happen whether you like it or not. Check the facts; check the assumptions; and believe in your ability to influence the future.

There are no panaceas: no grand solutions that will yield perfect libraries at no cost. For that matter, there is no such thing as a perfect library — not as long as libraries serve imperfect people who aren't all the same and who don't all just want small chunks of current information.

#### *A Few Possibilities*

If we accept that grand solutions and single futures won't work, then we can concentrate on a variety of smaller steps, some coordinated and some not, that will yield good short-term and long-range results. Eric Lease Morgan is doing yeoman work at NCSU in making sense of electronic serials. It's not clear whether electronic serials will become a major component of the scholarly publishing field, or how long it might take for a critical mass of such serials to emerge, but Morgan's early work in this field will help libraries and potential publishers to identify problems and make such serials more practical.

While I regard the digital library as an unfortunate phrase and real-world impossibility, digital collections make sense in many areas. For LC to put several million of its unique photographs and archival records into digital form and make them available is commendable. For groups of libraries to identify and convert key collections, that would

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not otherwise be available, makes enormous sense. Such collections do not replace print collections, but can add richness to local resources and provide outreach in unique ways.

As the Mann Library and others have found, increasing electronic access also increases use of print collections. That's particularly true if new technologies are used to provide deeper and richer bibliographic access. Some librarians have struggled recently with the fact that students and users may have better access to articles in periodicals than to chapters in books, even though the book chapters may provide much better starting points for research. Some commercial firms and libraries are taking steps to improve this situation, through table-of-contents access and other enriched forms of bibliographic access.

One enormous set of problems that will only yield to a multiplicity of efforts is quality control, organization, and authentication of electronically-available material. I've already mentioned this in connection with the Stuff Swamp; Eric Lease Morgan's efforts are one aspect of addressing the problem; there will be many others. No profession is as capable to address these problems as librarianship; no other field has the demonstrated ability to make coherent constructs from tens of millions of records over several decades.

Who else could possibly make sense of all this? Are you seriously going to trust computer scientists to bring order and quality control to electronic databases? Librarians have the professional background; some of you have the specific training; and we've simply done a better job of it than anyone else.

One problematic aspect of electronic distribution is solvable, namely authentication—assuring that the document you get is exactly what you wanted, that a referenced paper can be retrieved as it was referenced. The tools to solve this problem are available, but they're not used. What's astonishing is the number of intelligent people who proclaim that this doesn't matter—that a big advantage of electronic texts is that they are mutable, constantly being updated and revised. Well, if you're talking pure factual information (and you know that the source of that information can be trusted), and if it's the kind of information for which history is irrelevant, that may be a good thing. Right now, the only such information that springs to mind is the current time. Electronic distribution is an excellent way to provide checks on the current time. That's how it's been done for decades now.

What other categories of information, knowledge, and wisdom really live without history? Even stock prices have historical significance, and require authentication as to their date and time. Where can we simply assume that whatever we get is what we wanted, even though anyone along the line could have revised it? If someone cites an article as being outstanding, I want to read that article as it was cited—not the author's current version of it, and certainly not a mutated text that's been updated and improved by other scholars along the way. A well-written article is usually much more than a series of facts. If we derive information from data, knowledge from information, and wisdom from knowledge, I don't want to read someone else's knowledge as improved by anonymous others along the way. At least I don't want to without knowing about it.

Let's look at some other steps toward extended libraries.

### *National Bibliographic Access*

Libraries will reach beyond the walls more for resources beyond their local collections. One aspect of reaching beyond the walls is effective bibliographic searching. Here, there are two obvious tools that most public and academic libraries should have in the near future, as part of the Internet access that every library should eventually obtain. Those tools are Eureka and FirstSearch — one from RLG, the other from OCLC. It's not an either-or proposition; effective libraries need both, and the combination is cost-effective. For some libraries and consortia, now and in the future, Zephyr and the Z39.50 version of FirstSearch will make more sense, when the local user interface is sufficiently strong: that is, using that same interface to search the local catalog, the regional union catalog, and the RLIN and OCLC databases. These are good, cost-effective solutions.

What is not cost-effective is the so-called "free" alternative of searching Internet-accessible online catalogs directly to see what's out there. That makes sense in special cases. But as a general technique, it's hard to justify the time and complexity of several hundred searches (done manually or automatically) in order to save something between \$1 and \$1.80 in combined Eureka-FirstSearch costs. It's also hard to justify in terms of rational use of the Internet or computer resources, even discounting the truth that all those Internet-accessible catalogs won't provide the resources that Eureka and FirstSearch make readily available.

Eureka includes several hundred

thousand archival records, of substantial scholarly interest and frequently available to researchers; very few of the holding institutions have Internet-accessible catalogs. Eureka also includes a comprehensive view of pre-LP sound recording, all United Nations cataloging and many other specialized and unique resources within its 23 million title BIB file, some of them only available online through RLG. FirstSearch also offers many resources that can't be obtained directly through free searching. Even if that was not so, the truth is that Eureka and FirstSearch provide access to the universe of bibliographic information in two quick transactions, compared to a confused, sketchy, partial view after hundreds of transactions. Sometimes, centralized availability really does make sense, particularly when there's enough competition to keep the prices of both services reasonable.

Is it always silly to provide access to other online catalogs? Not at all. As the solution to access to the bibliographic universe, yes: it's neither an efficient nor a particularly sensible solution. But there are cases in which access to specific other online catalogs makes very good sense. More and more libraries will be involved in local and regional consortia with special access provisions. Access to the other online catalogs — or, better yet, to a real or virtual online union catalog — makes extremely good sense, as the second step in searching beyond the local collection. In many cases, a library and its patrons use the resources of other nearby libraries without formal consortia. Here, too, it makes sense to offer those other libraries' catalogs as choices on the local catalog. Finally, scholars can make effective use of specific online catalogs when they're planning research travel. In that latter case, automatic searching doesn't seem useful, though; specific access to the remote catalog, through a secondary function within the local system, is more sensible.

### *Tools and Techniques*

While every good library needs a strong local collection to serve most of its users' needs, no library can be self-sufficient. Libraries need and should continue to maintain a variety of document delivery methods. That can include regularly-scheduled book trucks and mail pouches. For some regions and some states, book delivery trucks may be the ideal technology for some access problems. Illinois has demonstrated that a combination of regular delivery and statewide access can provide effective and inexpensive access; similar mixed-technology solutions

may work equally well in other areas.

There are others, of course. I'll mention one other RLG service, because I think it's an important aspect of realistic access. Ariel for Windows offers cost-effective, high-quality, high-speed article transmission: not just from commercial suppliers, but perhaps more importantly from library to library, retaining fair use rights in the process. Hundreds of libraries have Ariel installations. There's no link between Ariel and RLIN; you don't need to use one to use the other. It's not the right tool for every library, but it's a worthwhile tool for many: not a grand solution, but one of many specific small aids.

#### ***Maintaining the Dialogue***

Finally, librarians must continue to discuss these matters, to identify interesting new tools and techniques, to guard against simplistic futures and unrealistic grand solutions. There is no single library future, but library professionals of all varieties must continue to discuss the many futures that will make us stronger. Today's meeting is one means for that discussion, held in old-fashioned non-virtual reality. Through conferences, papers, discussion groups, and those key discussions that take place on exhibit floors and in lobby bars, we

must continue to discuss and consider.

#### **Conclusion: And, Not Or**

I believe that electronic publishing and dissemination will continue to grow in importance, displacing print where electronic does it better. I also believe that printed books, magazines and newspapers will survive as vital media for the indefinite future. I believe in a future of print *and* electronic distribution.

I believe many future users will get most of their information without the mediation of librarians. That's true now; how would it be otherwise in the future? I also believe librarians will organize, collect, interpret and mediate for the many cases where professional understanding is needed. I hope that funding will improve for libraries, and particularly for strong support of the true expert systems in libraries: the wetware, the stuff between the ears of good librarians. I believe in a future of librarians as intermediaries and direct access.

I believe that libraries will and must rely more heavily on access to materials (and non-material information) that they don't own, and that they will find ways to share the risks, costs and benefits of such access. I also believe that most libraries, except for some in specialized areas, will and must continue to main-

tain and build strong collections of print and other media, to serve the essential needs of their users. I hope that librarians won't accept monolithic solutions to access problems; therein lies disaster. I believe in a future of collection development and access.

I believe librarians will reach beyond the walls of the library, providing many services electronically and gaining much information in that manner—and, for that matter, continuing to make use of physical delivery systems. I also believe that the library will stand, in the future as in the past, as the heart of every good academic institution and the soul of every city. I believe in the library beyond walls, but not the library without walls. I believe in future libraries as edifice and interface.

And, not or: that's what I believe, and what I hope for. It is also, I firmly believe, both the only realistic and the only worthwhile future for libraries and their users.

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#### ***Reference***

<sup>1</sup> Ron Chepesiuk, "Writers at work: How libraries shape the muse," *American Libraries* 25, no. 11 (December 1994), p. 984.



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