PRESIDENTIAL ADDRESS

Reimagining Archives: Two Tales for the Information Age

Leon J. Stout

Editor's Note

In this issue we present two addresses by Leon J. Stout, 56th president of the Society of American Archivists. The first address, "Reimagining Archives: Lessons from the Museum Experience," was given as Stout was about to assume his duties as president at SAA's 2000 annual meeting held in Denver. "The Cyberarchivist: Mary Jane Meets the Information Age" was delivered at the opening plenary session of the 2001 annual meeting held in Washington, D.C. The following texts have been revised slightly for publication in the *American Archivist.*

Reimagining Archives: Lessons from the Museum Experience

Incoming Presidential Address, September 2, 2000

Most of you know me as a university archivist, a practitioner of our art for the last twenty-six years or so. However, as an adjunct instructor, I have also been teaching archives administration for the last twenty-one years. There is no more valuable experience than teaching to force you out of your comfortable habits of thought, and I still look forward to students who challenge those ideas of mine that have become encrusted with time.

Last fall I had the opportunity to work with two doctoral students in museum studies in a seminar comparing archives and museums. Both students had experience working in archives, but were now moving into the work of art museums and art education. This class gave me the opportunity to reflect on the commonalities and differences we share with our colleagues in museums.

It also made me aware of the soul-searching that museum professionals have been engaged in of late. Some took the start of the new millennium as an opportunity to focus this self-examination. In reading much of this literature, it struck me that I've heard very little of this sort of thing from archivists.[1]

Perhaps we've been too shell-shocked by technology's impact on archives. The opportunities and challenges associated with EAD and the Web are over-whelming to a lot of us. When it comes to electronic records, I think many archivists feel like those folks on the beach in the movie *Deep Impact,* awaiting the arrival of the thirty-story, comet-induced tidal wave.

Perhaps we've really felt the tide rising for the last decade, but I don't sense any strong impulse to reimagine ourselves for the future as the museum folks are doing in their discussions. Do we lack the imagination? Are we just too con-tent with the status quo? Or are we the deer frozen in the highlights of the oncoming information technology bus?[2]

Some of the reimagining in the museum field in the last few decades has stemmed from a growth in controversy over museums, their exhibits, their funding, their governance, and, in essence, their function and future in soci-ety. The historian Neil Harris, in a 1995 article entitled "Museums and Controversy," concluded, "We need to reflect on the ever-changing status of museums and museum exhibitions in the life of our culture. We have both an institutional inheritance and an institutional future to ponder. We can be—and should be—responsible for both."[3]

What reflections on the state of the archival enterprise does this provoke? Can we describe the status of archives as "ever-changing"? How much ponder-ing of our inheritance and our future is going on out there?

Let's look at three areas of controversy and consider the reimagination that's occurring in museums and what it suggests about archives. These areas won't be clear-cut and the themes will interweave, but I hope that the exercise will be useful.

Perhaps the most basic area of controversy is function. The fundamental feeling about museums over the last couple of decades is that it's not about the

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[1] A number of sources have influenced my observations. *Museums for the New Millennium: A Symposium for the Museum Community, September 5–7, 1996.* (Washington: Center for Museum Studies, Smithsonian Institution, and the American Association of Museums, 1997), and the collected articles in the issue entitled "America's Museums," *Dadalus: Journal of the American Academy of Arts and Sciences* 128 (Summer 1999) were particularly valuable.

[2] Richard Cox is, of course, the extraordinary exception and his prolific output has always stimulated my thinking. For example, "Archives and Archivists in the Twenty-First Century: What Will We Become?" *Archival Issues* 20, no. 2 (1995), 97–113, and "History's Future: American Archivists, Cyberculture, and Stasis," in his *Closing an Era: Historical Perspectives on Modern Archives and Records Management.* (Wesport, Conn.: Greenwood Press, 2000), 223–42.

[3] Neil Harris, "Museums and Controversy: Some Introductory Reflections," *Journal of American History* 82 (December 1995): 1110.

objects anymore; it's about the stories they can tell with the objects.[4] While museums have always had a didactic purpose, they have increasingly sought to be relevant to their public. They believe they can't simply provide stimulating and enjoyable experiences through exhibits and expect to get the crowds they increasingly need. Folks can get that at Disney World, or the mall, or a movie. Museums have to offer a unique experience, one that provides value in the larger work of the community it serves. Note that it is the experience that has to be special, not simply the collections.

Not only is this somewhat difficult to accept for museum professionals, it can be the source of controversy in the larger world. Museums are seeking to attract a larger share of the public through their doors, but the evolving curatorial mindset in many museums takes its values from the academic world, where exhibits that stimulate critical thinking are highly desirable, and may help determine, through the peer-review process, the amount of funding available from humanities and arts endowments. The public does "not generally enjoy the process of confronting and exploring the unfamiliar and learning from it."[5] One has only to recall the Enola Gay controversy to realize that by exposing itself in this way, the museum has become a political actor.

We must not forget the impact of marketing and merchandising on the museum. The blockbuster exhibition, the membership drives, the mail-order catalogs, the study tours, and the magazines simply complement the diversity of spaces, including the museum shop, the restaurant, the reception hall, the theatre, even the space to get married. This is not just a cabinet of curiosities anymore. Museum curators really are wondering, "What business are we in?"

What about the archives? Are we questioning what business we're in? Not as far as I can see. We have a very strong and coherent sense of our mission. Our 1997 statement on "Archival Roles for the New Millennium" states, "Global telecommunication and computing technologies are changing the way individuals and organizations communicate and do business. Moreover, these dramatic changes are occurring at a time of changing societal dynamics. Nevertheless, the fundamental archival roles and responsibilities remain the same but also are more important than ever."[6]

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[4] Over the last six years I have participated in a planning committee for Penn State's recently-opened All-Sports Museum. I was fascinated to observe the evolution of the exhibit designer's "storylines" and the *subsequent* hunt for images and artifacts to illustrate them. This, of course, reverses the normal archival process, in which we gather records and then see what stories can be told from them.

[5] Harold K. Skramstad, panelist in "Changing Public Expectations of Museums," *Museums for the New Millenium,* 37.

[6] Society of American Archivists, "Archival Roles for the New Millennium," August 26, 1997). <http://www.archivists.org/governance/handbook/app_j3.asp> (May 1, 2002).

The museum has become a purveyor of stories, a venue of opinion. This has opened it to criticism and controversy over freedom of expression as segments of the public question not just the judgments of curators, but even their observance of morality and law.

Archives, on the other hand, have consciously avoided the suggestion that we push a particular point of view. We assert that we don't tell the stories; we provide the raw materials for people to construct their own stories. In our core mission, we are not a venue for people to see something, as a tourist or a visitor sees an exhibit; we are there to facilitate the work of research. In some cases like genealogy, the research is a leisure activity rather than a vocation, but fundamentally, our clientele (we call them "users," not "visitors") is there for active work, not passive viewing.

Of course, we do engage in outreach programs—exhibits, lectures, slide shows, historical brochures, etc.—in which we sometimes take on the role of storyteller. But we assert that our purpose is primarily illustrative, we are demonstrating the use of the records and informing the audience of the variety of what's available. We are simply reaching out to entice them in for the real purpose—to get them doing research.

So, can or should we be reimagining ourselves in this sense? For us it still *is* about the collections, and, in appraisal, the stories *our users* can tell with the collections are what often guide us. One could, I suppose, make the argument that potential bias in deciding what to collect or preserve as archival could unduly influence the stories that could be told. Do we consciously avoid some records as unsuitable or inappropriate? I don't think we shy away from controversy.[7] Do we avoid some records because we just can't get worked up about the subject? Possibly. I hope some archives are documenting bird watching and the Tupperware phenomenon.

We have adopted "relevance" into our collection-building strategies. We responded to the new social history and reversed the under-representation of women, minorities, the working class, and the poor in our repositories. On the other hand, unlike most historians, we haven't abandoned traditional political, diplomatic, and military history as collecting concerns. And perhaps we should congratulate ourselves that our user community has expanded beyond the professional historians, who we traditionally believed were our majority and core users in the past.

Our audience has grown, along with the number of archival repositories. But do we need to expand the numbers coming in our doors by attracting people for something besides historical research? The National Archives has 'em lined up on the mall side to see the charter documents, and many look at the

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[7] See for example, Frank Boles, "Just a Bunch of Bigots": A Case Study in the Acquisition of Controversial Material: Acquisition of Ku Klux Klan Membership Records by the Clarke Historical Library," *Archival Issues* 19, no. 1 (1994): 53–65.

changing exhibits and do a little shopping too. Do I foresee a situation like the Family History Library in Salt Lake City, with bus after bus of tourists lining up to drop their passengers for a half-hour of genealogical research "lite"? Gosh, I sure hope not.

Of course, one factor that drove museums to change was funding. That certainly is affecting us as well. How do we secure more money for staff, space, supplies, and services? Most of us can't or don't want to charge admission, so fundraising and development work is called upon, as well as, perhaps, fees for special services, and some sales of reproductions and books. We're doing these things, but I can't say we're altogether comfortable with them. We have always prized our independence and integrity as honest brokers of records without a point of view to advance. Even the suggestion of a potential conflict of interest is discomforting.

An archives will probably never become an economic factor in its community. We'll never be a tourist attraction as long as we hold to our core mission. Compared to museums, we do what we do for a relatively narrow slice of the population. There are not an infinite number of people wanting to do historical research or needing historical information from records who are out there waiting to find and use us. There's no question we have "neat stuff" that people like to see, but the more we emphasize its display and attractiveness to visitors, the less right we have to put the word "archives" on the door.

Perhaps one of the fundamental shifts could come from technology. Museums have adopted the Web and all sorts of mediated exhibits with great delight.[8] Participation in museums, the use of interactive elements including video kiosks, touchscreen data kiosks, video special effects, ambient sound, and hands-on artifacts where visitors get the feel of an object and how it works in simulation, is increasingly seen as necessary to entice kids into the museum, and to get them to bring their parents back for a repeat visit.

Museums have also quickly gone beyond the website as an automated brochure and billboard and even ticket office, to putting more and more of the exhibits and related materials on the Web. Now museum professionals are discussing the virtual visit—the opportunity for visitors to come when they want, regardless of the time or day, and even to see what they want to see in the order they want to see it in—to structure their visit to suit their own tastes. Are you annoyed by modern art, do you want to skip the rocks and gems at the natural history museum, do you simply hate those first ladies' gowns? No problem.

Clearly, more people than ever before can visit a museum on the Web, but what does this mean for the quality of the museum experience? Is seeing it in person better than seeing it on the screen? Museum-going used to be primarily a private experience, you strolled the exhibits unimpeded by crowds or

[8] Sue Ann Cody, "Historical Museums on the World Wide Web: An Exploration and Critical Analysis," *Public Historian* 19 (Fall 1997): 29–53.

noise. Not so now. The blockbuster exhibit on a Sunday afternoon is more crowded than the subway at rush hour. Docent-led tours and not-always-quiet audio aids for self-guided tours are now the norm. And human-led tours are increasingly interactive. Docents ask the visitors questions, welcome their addition of special information others may not know, invite visitors to share their feelings and interpretations of what they're seeing.

The virtual visitor loses the stimulation of the other senses that a real visit entails. We don't see the art or exhibit in its context. No virtual visit could adequately recreate the sensitivity of being in the Japanese teahouse in the Philadelphia Museum of Art, for example. So while there *is* a dramatic change in the presentation of exhibits and the rituals of museum-going, there is no question that, thanks to the Web, the student or the curious can go places from their desktop that they previously couldn't afford.

There are, of course, concerns in the museum community as well. The management of images is a source of great concern. How does one protect intellectual property in the images being mounted on the Web, and conversely, how does one make them pay off if Web exhibits inhibit actual gate receipts. How does the museum authenticate the images, and certify them as reliable "truth"? Finally, how does the museum make the on-line exhibit satisfactory as a research resource for students? How complete will the exhibit be? How much of the label is there? How much background to the object, its creator, and the context of its creation or use will be presented? In some museums, much of this content began as interactive kiosk presentation material, there to supplement the actual experience of a real visit. Now, it's transformed into a virtual exhibit. The cost of all this is enormous. Museums have to appear to be up to date, but is this where a large share of their resources will go in the future? Will there even be places called "museums" for people to visit?

These concerns certainly parallel those of archivists in relation to technology for the archives. Archives on the Web so far seem to be largely collections of on-line brochures, photo exhibits and historical information, the beginning of access to collections through on-line finding aids, and the beginnings of collections of actual scanned images of archival records. Paralleling museums' issues, archives will have spent enormous amounts of money to increase the accessibility to archival collections on the Web. There are relatively few archives that have scanned any significant portion of their collections and mounted them on the Web. Just as we learned with microfilm, mediating access through technology does not save the archives any work—collections must still be processed and described, and then, in addition, converted to another format, in this case, digitized.

In addition, archives must consider the preservation aspects of converting archival materials into digital objects, as well as the additional need to craft more advanced finding aids to help navigate the architecture of massive archival websites. These indexes will likely provide the provenance-based con-

textual information we are used to creating, as well as some form of content-based indexing to enable users to move more directly to high-precision search outcomes from among the thousands of digitized images. And, of course, guaranteeing the long-term functionality and image quality of the scanned material and its indexes and the preservation of these digital objects is a major commitment in itself.

Even with a sophisticated package of catalog records, EAD-based search-able finding aids, and a linked set of masses of document images, we cannot duplicate the visit to the archives on the World Wide Web. For experienced users who understand the history of their topics and have used other primary sources, then there might be little diminishment of the value of the service. But for the inexperienced user—the high school student, the undergraduate, or the researcher beginning a new approach to a topic—the quality of the on-line experience will not replace the actual visit to the archives and the continuing interaction with the archivist. The on-line experience will not enable the shift in research direction that a serendipitous discovery can enable when you are actually in the archives. The "expert system" that is between the ears of the archivist will not be duplicated on the Web.

It seems inevitable that we will try to do these things, that we will try and find the funds to make some portions of our collections accessible online. Does this constitute reimagining the archives? Will there still be archives thirty years from now for our children to go to? Some futurists say we'll be more time-constrained then, so an on-line visit as the first choice is much more likely. In addition, life-long learning will be more of a given—both through a seamless transition from formal schooling to informal learning as adults and through an economy where change happens so rapidly that people are forced to re-educate themselves on a regular basis.[9]

As we mature as a society, we come to see change as a constant. Thus, it should not seem paradoxical that the stability of history and making connections to the past become increasingly attractive. We seek our roots not only in the history of our families and communities; ethnic, religious, or racial groups, but even our voluntary associations, avocations, and work. As a consequence, we'll see more people approaching us for historical information and, if it's not there in digested form, being willing to do it themselves. While the need for archives to guarantee our rights and hold our government accountable to its citizenry doesn't diminish, the cultural uses of archives will continually increase—and it's via the Web that people will seek that information. So the archives doesn't disappear—all of that content has to be somewhere—we just will do much more of our business for remote researchers, and this does have implications for how we spend our resources and our time at work.

[9] Jennifer Jarratt, panelist in "External Factors Affecting Organizations," *Museums for the New Millennium,* 26–27.

A final area of challenge and controversy has to do with representation and the connection of the museum and the archives to their communities. Michael Heyman, former secretary of the Smithsonian Institution, talked about the full plate of controversy he faced when he took that position in 1994. Besides the Enola Gay controversy, he remarked on the increasing desire for unrepresented groups of all kinds to have their stories told, and to be a part of determining what would be said and how it would be shown. In his particular case, it was the Latino community that was castigating the Smithsonian for not being more inclusive of Hispanic concerns and materials and people.[10]

Increasingly, underrepresented groups have come to the fore and said, "Wait a minute! We were there too, we participated; we have a history, a story to tell as well." All of us here know that archives play a valuable role for communities of people. We preserve the primary written, pictorial, aural, and graphic record of persons, both individual and corporate. As collectivities, these records are also the symbolic repositories of the cultures and history of their communities. In such general terms, similar expectations are held for museums. But with museums, it goes further. The museum presents the chance for the story to be put on display, and that's where the challenge comes in.

Since the community values the telling of the story so much, the story has the potential to add real value and esteem to the people's lives, to have others outside of the community learn of its history and culture, and, one would hope, come to respect it as an equal. Clearly, this places great pressure on museums to tell an acceptable story. The challenge of what is truth and accurate judgments, as well as the potential of the exhibit to stimulate critical thinking (as measured on the academic scales of the curators), may well be in conflict with a community that wants only to celebrate (like the World War II veterans who bitterly fought the Enola Gay battle), or with a community that wants a fuller and more positive story told.

This willingness to challenge the previously accepted authority of the curator has come along with social changes that make questioning authority by everyone the norm, and that reinforces the sense of entitlement that previously under-represented groups feel in the accepted need to redress past wrongs. Even the Smithsonian guidelines for ADA accommodations in exhibits include the need to consult with the disabled on both how their needs are met and whether (and how) they are portrayed in exhibits, literature, and other products of the institution.

While the archival community has affirmatively sought to address underrepresentation in our collections, we have not had the degree of criticism and desire for influence that museums have had. Clearly, we have always had a range of advisory bodies in our repositories, but these were usually scholarly

[10] Michael Heyman, panelist in "External Factors Affecting Organizations," *Museums for the New Millennium,* 18–20.

colleagues—the people who used the records, not the people who made them. This may come to be more of a factor in the future. We will likely have to share our authority in planning an archives that documents a particular group of people with representatives of that group. Some will see it as a risk, others as simply the right thing to do.

Those whom we have sought to document have usually ceded to us our expertise in selecting the record and describing it. They would say that we would know best what to save. Well, that will probably change. As we become a more significant cultural force, as we become more visible, we inevitably open ourselves to greater public scrutiny.

We have had exposés in the past. We don't much like them. We resent glib journalists who refuse to appreciate the nuances we regard as essential to our existence. We're annoyed when they inevitably mess up the details.

I think this will be part of our lives in the future, however, while we're focusing increasingly on the incredible revolution brought about by information technology and the electronic record. How we see our purpose in society, how we provide services to remote users, how we interact with the communities we seek to document—all of these factors have the potential to change the archival enterprise as we know it. Let's not forget that while we strive for greater support and acknowledgement of our role in society and our culture, we need to be realistic. Like the museums, we may get more than we bargained for.

The Cyberarchivist: Mary Jane meets the Information Age

Presidential Address, August 30, 2001

When I talked to you at last year's closing plenary session, I spoke of the potential for reimagining archives. In comparison, I discussed changes in the field of museum work and the challenges museum curators were facing in the realms of public involvement and information technology. In suggesting contrasts between our museum colleagues and ourselves, I noted that we had not yet reimagined ourselves as museums had; but the more we did so, I suggested, the more realistic and prepared we needed to be for the range of potential outcomes of these efforts.

Technology represented a significant portion of that talk. A discussion of the virtual museum online and the issues surrounding the intellectual property and preservation of images on the Web were the concerns that struck me about museums and computers. In the realm of archives, I touched on access to collections, both through finding aids and digitization of portions of collections for the Web, and on the questions surrounding navigation, website design, and indexing for searching.

As we've passed through a year, the impact of technology has sharpened for me. I described our strategic planning activity briefly in my last *Archival Outlook* column, in which I noted "the sense that the essence of 'archivist' is changing; both who it is and what it includes seems to be increasingly in flux. . . . It is increasingly obvious that our environment is changing and that it's not technology alone that is responsible. We perceive that we are on the brink of a new paradigm in our work environment and that archivists need to adapt."[1] While I said "that it is not technology alone that is responsible" for the sense of change we're perceiving, I do have to say, it's *primarily* technology that is bringing this to the fore.

Personally, I have to tell you that I'm comfortable with this change. I've had a long-standing interest in computers, going back to the information science and PL/1 programming courses I took in the early 1970s. I joined the SAA Task Force on Automated Records and Techniques at the 1980 SAA meeting in Cincinnati, and that changed everything for me. I discovered I was not alone in my desire to mix archives and computers. At that time, I was primarily interested in the technique side. I taught my first workshop on computer use for archivists at the 1984 SAA meeting right here in Washington.

With the arrival of the personal computer, I had diskettes and hard-drive files to think about as well as my main frame back-up tapes, and I became more interested in electronic records. With the development of records management at Penn State, we were awarded in 1991 an NHPRC grant to appraise administrative computing datasets. Since that time, I've been involved in an advisory capacity in a variety of electronic records projects. I now have the good fortune to be involved in both the InterPARES Project and the advisory group of archivists for the San Diego Supercomputer Center's persistent archives project.

In essence, I've been a missionary for computer use and addressing the challenge of electronic records for more than twenty years. I've seen most archivists move from indifference or open hostility to acceptance of and reliance on computers, and (more recently for some archivists), to delight and even fascination.

I believe our strategic planning direction toward a new archival paradigm is vital for us. However, I'm not suggesting that, through it, we'll abandon our core functions, or that we'll lose our sense of the significance of history in our work as archivists. Our foundation remains the history that we find in the records we preserve and help people use. However, the context within which we will find our future records and help people use them is a technological one.

The archivists we are now training in our graduate programs and want to hire are ever more computer-literate. We're expecting them to enter a world

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[1] "SAA and the Road Ahead," *Archival Outlook* (July/August 2001): 3, 27.

where discrete, stand-alone repositories are no longer "doing archives" as they please. We envision our repositories as networked, connected, and observing broadly accepted standards. The former world was largely paper, and it was managed in a paper world, too. We placed records in acid-free boxes and file folders, we typed up inventories of the contents, and we created catalog cards that described collections and served as cross-referencing tools. Some of this we still do, but the computer has become a dominant presence in managing archives.

First came word-processing software. It made correspondence and the creation (and inevitable revision) of inventories and lists so much more efficient. Then came database management software. As either home-grown databases to organize all types of information, or software packages bought off the shelf to manage collections, or library on-line public access catalogs to which we contributed bibliographic records, computer databases have almost completely replaced card catalogs. The arrival of networking to bibliographic utilities then made it simple to share these records and build massive databases of archival cataloging information, accessible all over the world.

Of course, along with networking came electronic mail. Not a day goes by now without messages from everywhere asking us for information or records to document some person, place, or event. That has become typical for most archives. Of course, what stimulates most of these long-distance inquiries is what people see on the Web. Every archives has or needs a website. As we increasingly recognize, our websites are our front doors to the world.

Initially, they were simply on-line brochures, briefly describing our collections and the services. As more listings of collection contents were prepared via computer, those files could be placed on the website for remote searching. The evolution of the Encoded Archival Description standard will revolutionize this all over the world. Scanning technology has stretched the concept even further—now we can have facsimile images of the records themselves on our website in the form of virtual exhibits or even "historical editions" with editorial commentary and contextual information. With these, researchers can visit us to look at records at midnight on a Sunday if they so choose. Of course, scanning for our needs opens the door to scanning for patron needs. Frequently now, users request copies of photographs and document images in scanned form to be e-mailed to them or placed on FTP sites for downloading.

While "*doing* archives" has become dramatically different in the last twenty-five years, the records themselves have changed as well. In the past, few archivists had experience with mainframe computers. In fact, many archivists ignored electronic records until the PC arrived on their desks.

Now we have word-processed documents, either random files or embedded in document management systems, e-mail messages, databases, spread-

sheets of financial data, statistical data sets, maps derived from geographic information systems and blueprints from computer-assisted drafting programs, digital photographs, digital audio and digital video files, and web pages that have become the only copies of records that used to be printed on paper. Some portion of all of these types of records has to be saved—no small matter. Virtually everything that could be paper in the past, can and probably will be digital in the future. Gradually, the proportion of accessioned records that are in digital form will rise inexorably.

The traditional challenge of making appraisal decisions doesn't change; however, the recordkeeping environment has altered dramatically, and that may make problems for archivists who need to access and examine these records and their contextual metadata. Access is frequently controlled and defined in security systems to protect both the privacy of the records and their vulnerability from being altered or destroyed. If the archivist and the archival process are not part of the normal operating procedures for electronic records in the institution, there will be severe difficulties in preserving an archival record.

We need to be perceived as natural partners in information technology, and be free to do our job. Of course, then we are faced with the challenge of saving something for centuries into the future that our colleagues insist on changing every few years. We've long known that the media on which we store these digital objects don't last and what's worse, the hardware and software to "read" them is redesigned as often as the market will bear an upgrade. Over and above these realities, however, is the exploding growth of electronic data in a variety of sectors. Dr. Parmesh Dwivedi, of the National Oceanic and Atmospheric Administration's National Ocean Data Center, tried to give some dimension to the problem at a recent conference.[2]

> [Worldwide, researchers are] exploiting massive observational and computer powers to generate many orders of magnitude more data or information in just a few seconds than was generated in the previous two thousand years. . . . [I]f the rate of processing power and the amount of data it generates continues to progress at its current rate of doubling every 18 months . . . we can anticipate annual data collection volumes to grow to a yottabyte (10^{24} or 2^{80}) in volume within the decade This is hundred times more bytes of data than all the stars in the Universe.[3]

[2] Parmesh Dwivedi, "Archive—Where It Started and the Problems of Perpetuity." *Large Scale Storage in the Web,* Proceedings of the Eighteenth IEEE Symposium on Mass Storage Systems and Technologies, April 17–20, 2001, San Diego, Calif., 354. <http://storageconference.org/2001> (May 1, 2002).

[3] Here is a brief summary of the ascending levels of terms for measuring the size of electronic data. MB, megabyte = 1 million bytes; GB, gigabyte = 1 billion bytes; TB, terabyte = 1 thousand billion bytes (contents of LC = 10 terabytes); PB, petabyte = 1 million billion bytes (2^{50}, = contents of 20 million 4-dr file cabinets); EB, exabyte = 1 billion billion (quintillion) bytes (10^{18} or 2^{60}); ZB, zettabyte = 1 trillion billion (sextillion) bytes (10^{21}); YB, yottabyte = 1 trillion trillion (septillion) bytes (10^{24}). <http://www.logophilia.com/WordSpy/yottabyte.html> (May 1, 2002).

Archivists require strategies to put records management and archives into the life cycle of electronic recordmaking and recordkeeping in our institutions. We need to create the environment where we can act on electronic records, appraise them, arrange, describe, and provide reference service for them. If we achieve that, then the methods for actually preserving the content, context, and functionality of the records into the future may be headed for resolution. Computer scientists and archivists are now cooperating to systematically model the preservation of authentic and reliable electronic records in the InterPARES Project, and they are also planning computer systems to preserve electronic records for us automatically. The Persistent Archives project at the San Diego Supercomputer Center aims to produce an "archivist's workbench"—a suite of software tools to do exactly that.

Who will do this, however? Unquestionably, we need to partner with information technology staff in our institutions. It seems less likely, however, that they will do all the heavy lifting for us. It's our mandate, they reason, not their's. Nor will it likely suffice to simply have a resident wizard, that computer geek we hide in the closet until we need something done with this stuff.

In our future, I believe we are talking about all of us becoming, to one degree or another, "cyberarchivists," people who comprehend and are comfortable with completing archival functions with the new electronic versions of traditional records, and who comprehend and are comfortable with running the archives in a computer-enabled mode. The cyberarchivist needs to understand not only how the software, system, and network contexts work, but also how to accomplish our core functions in that environment. A mechanistic knowledge of how to simply run various pieces of software will not be enough. More importantly, the cyberarchivist will require an understanding of how people use archives in both the traditional and new technology worlds. We will also need the ability to analyze the implications of designing computer tools to accomplish archival ends, an understanding of human-computer factors in our context, and the ability to plan accordingly for effective implementation.

In 1990 John Fleckner delivered what may be the best known of all SAA presidential addresses, "'Dear Mary Jane:' Some Reflections on Being an Archivist." In his three letters to his young colleague, he discussed what motivated him to become an archivist, the profession's satisfactions, and its values. I've thought often about that essay as I've discussed it with my students. Most of what John said about the satisfactions of reconstructing the past captured in the historical materials; of first learning and then teaching the craft of archival work; and of recognizing in what we do, its essential value for ourselves, our users, and the broader public, still holds.

But things *are* changing. In the future, we'll less likely be faced with a basement of records in various stages of decay or disarray. The challenge of bringing order out of chaos, of giving meaning to piles of paper, to feeling good

about saving history, both the tangible records and their intangible stories, will change. More likely, we will find a box of diskettes, tapes, or CDs which carry too little identification or haven't been upgraded into newer systems. We'll be fortunate to glean anything from such artifacts; instead, success will have to come from a systematic analysis of current recordkeeping applications and the implementation of a records retention and disposition schedule. John's Mary Jane might have found that hard to match up with her expectations for archival work. The cyberarchivist, however, will jump right in with both feet, taking the measure of the situation and using the tools they have to establish order in the potential chaos and find the records that are worth keeping for the future.

In a keynote address to the New England Archivists, John recently talked about the "glass house" the new archives has become, with our finding aids and our policies and decisions now open for the inspection, thanks to the Web, of an infinitely broader public than we have ever entertained before. It brings us back to our reimagining of the archives. We have much to consider in our potential transformation.

How do we reach this paradigm? Graying archivists (like me) will soldier on, learning as much of the new stuff as we can, for, as John said, this is a learning profession—the opportunity to learn something new every day is one of the reasons we love it. Many of our newest young archivists will find this role a natural. They're growing up with computers. Most will have more experience with digital objects than handwritten letters before they graduate from high school.

The technical concepts and knowledge base are being built into schooling as we speak. When eighth graders can download video clips and pictures from the Web and scan diagrams and charts in to create multimedia science presentations, well, I have no doubts that the expertise will be there.

Natural curiosity about history and the past will not disappear either, so our potential cohorts of archivists will continue to come forward. The challenge is for archival educators to teach not only core concepts but to also weave together these natural interests and talents, with understandings of implementing the computer-enabled archives and addressing the proliferating electronic record—the archives of the future. I know our best programs are already starting to do this.

So while I may sound painfully upbeat about this future to some, let me add a final caution. John's talk concluded by discussing four enduring values of our profession—that we are a profoundly humanistic, learning, ethical, and collaborative profession. I agree with them all, but let me add another. In the midst of technological revolution, let us not forget that this is a caring profession, that our primary function is service and that this business is personal. Regardless of laws or policies, "doing archives," funding it and providing the necessary resources, giving it a seat at the table, and turning over the record we deem worth saving—is usually a matter of choice for the people we serve. In

the end, we must demonstrate to funders and users alike our competency and usefulness, that we add value to their working or personal lives and that we share with them an interest in what they do and care about.

Technology is not an end in itself, although it is sometimes amazingly seductive. It is a tool, yes, it's the hammer; and now it's also the nail and even the wood, but the house we build is still for the history that we need. Cyberarchivist or not, I firmly believe that remains true.