Doing History in the Digital Age

How 'digital culture' is replacing 'material culture.' and what it means for historians, archivists and conservators.

by
Gordon Bond

"There is a generation of kids who have now grown to young adulthood having never known what it was to not have a keyboard of some sort to communicate."

If you're of a certain age–like me–you probably remember those long charts from grade school, that ran along the top of the chalkboard, from one end to the other, showing the cursive letters, both upper and lower case, complete with guidelines. (And you probably also remember things like film strips and the contact-high from quizzes printed on "Ditto" machines.) Somewhere between then and now, however, I stopped writing in cursive. I'm not really sure why. I still marvel at folks who have fluid, flawless cursive handwriting and love old manuscripts and letters–at least when the handwriting is legible. When I did a lot of my note-taking by hand–before computers–I evolved a printed upper and lower case style. Recently, however, I have fallen into an all-caps printing that, even when my hand is tired, is still reasonably legible for me even months later. While I still take notes by hand (with a fountain pen, I might add, unless the archives requires pencil), these days much of my writing is done on a laptop. Granted, like my handwriting, I have developed an idiosyncratic method using the index and middle finger on my right hand and the index finger on my left, with the thumb thrown in for the shift key. I have no idea what my "words-per-minute" may be, but it gets the job done.

It was a slow and personal evolution, taking place over many years, driven by practicality and comfort. I can't say my lack of cursive skills hurt me. Yet it still jarred my sensibilities to a surprising degree when a friend, a former NJ public school teacher, told me there was a serious debate in education circles about getting rid of teaching cursive.

Really?

But then I looked from the *email* in which she mentioned this down at my fingers on a *keyboard*...in a way, I *was* the reason.

And now there are even rumblings about the necessity of teaching spelling–though I'm not all that sure how serious they are. After all, the argument seems to go, doesn't everyone have SpellCheck?

There is a generation of kids who have now grown to young adulthood having never known what it was to *not* have a keyboard of some sort to communicate–be it on a computer or handheld device. Or, for that matter, what it was to have to remember to bring some quarters for a payphone in case of emergency. Or having to wait for a roll of film to get developed. Or the crackle and hiss when you first put a needle onto a vinyl record. Or have to untangle the tape from the audio cassette your cheap tape deck just tried to eat.

Wow. I feel old.

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The New "Digital Culture"

Back in 2008, I attended a lecture by historian and Pulitzer Prize winning author, Gordon S. Wood at Princeton University. He posited that the 18th century was the naturally ideal period for the historian.

I agree. Why? Think Goldilocks.

Before then, literacy and printing was the exception and limited to reflecting too narrow a demographic for anyone trying to gain a broader understanding of the period. After that, the sheer quantity of material culture–made possible by the demands of greater literacy and the ability of mechanically-powered presses to supply it–starts to become a bit overwhelming. In the 21st century...well, forget about it! Consider for a moment the billions of emails alone, flying back and forth over the internet at this very second. Think about the hundreds of millions of websites–one source claims there were exactly 266,848,493 at the end of December 2010–and all the print magazines, newspapers and books published every year. For Wood, the 18th century provided a "just right" balance of literacy and technological ability to mass-produce the written word.

Print media in all its forms exploded thanks to rapid, mechanical printing, and a steady supply of cheap paper, all coupled with an increased consumer market made possible by increased literacy, spare time to read, and accessibility through the business models of book stores, libraries, newsstands, home delivery, etc. Add to that the advent of mass-produced movies, audio recordings and vernacular photography and you can see how lots of people began to leave behind massive piles of "material culture"–physical items that later generations could sift through to read or see or listen to, that provides access to first-hand interpretations of life back when.

(I should say at this point that this article focuses more on the ephemera–paper-based artifacts like letters, books, broadsides, photographs, etc.; as opposed to more durable artifacts, like buildings, cars, tools, pottery, etc.)

Up until recently, much of what historians, archivists, preservationists and librarians had to deal with has been what is broadly called "material culture." Basically, the phrase refers to the relationship between physical artifacts and the societies that produced them. Study and interpretation of this material culture, along with other disciplines, can help create a picture of what even ancient cultures might have been like. But now there is another form of culture–what I call "digital culture"–that is being produced by present societies at a prodigious rate that is replacing analog material culture. And, it will be these kinds of

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"artifacts" that future historians will have when they look back at us–assuming, of course, we can figure out how best to preserve enough of it.

What is "digital culture"? It's the emails that have replaced handwritten letters. It is blogs that have taken the place of handwritten journals. It's the digital content of online magazines–yes, like Garden State Legacy–that are rapidly replacing broadsheet newspapers. Paper artifacts are ephemeral by nature, vulnerable to discarding, burning, dampness, fading, insects, mold spores or even inherent self-consuming qualities (think old, brittle, crumbling newspapers printed on paper with high acid content). Nevertheless, properly preserved or even by a little dumb luck, and someone's letter from 1776–a physical thing–can survive to present day and beyond. By contrast, an email–a digital file existing on some server somewhere or on someone's computer–is even more ephemeral than its old fashioned paper counterpart. As robust as our digital culture is, it is also amazingly fragile. Same goes for digital pictures, video or audio. What will archivists and librarians a hundred years from today still have to tell our story from the dawn of the digital age? How can historians, archivists, librarians and curators adapt to this new paradigm?

I decided to put this question to the New Jersey history community via the H-Net New Jersey History listserve–and yes, I am aware of the inherent irony in that.

The Digital Boon to Research

There is, of course, a "curmudgeon factor" here. Pretty much every major shift in technology has been ushered in with an older generation on the sidelines sorrowfully lamenting the death of the old ways–or even how it will bring about the moral decline of the younger generation. The reality is that most change is a mixed bag of tradeoffs. I personally witnessed the emergence of computers into the graphics and printing industry. I saw how it put a lot of people out of a job. And it wasn't just a matter of adapting, since it reduced the number of people needed overall. But the same technology that played havoc with the lives of men and women who had long earned livings from doing things one way, also opened up the opportunity for someone like myself to do freelance work from home and even to start Garden State Legacy.

The digital domain has both opened opportunity and presented problems for historians as well. On the plus side, it has been a boon to researchers of all sorts. The gift this paradigm shift has given the world is *convenience*. As I sit here in my

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–Frank Curcio

home office at my laptop, sipping tea, I can access information from all over the world. I can inflict upon my Facebook friends pictures of something cute our cats did five minutes ago. I can put this article on my website and have it accessible to the world in maybe fifteen minutes, tops. If I find a typo, I can fix it by simply swapping out the content. No printing costs; no postage costs.

And, I never even have to get out of my chair.

I have learned the value of a subscription to both Ancestry.com for access to census and other records and Genealogybank.com for their expanding collections of digitized newspapers. While they've raised some interesting copyright law questions, Google books has brought even obscure titles within clicking distance. And, even when material isn't online, the digitization of library and archive card catalogs–and the ability to quickly email their staff–has saved me countless hours, miles and effort, by knowing in advance which institutions have what. I can hit the ground running, call numbers in hand, confident my gas and tolls to get there won't have all been for naught.

"As a local historian I champion the digital culture," explained Frank Curcio, a member of the Hunterdon County Cultural & Heritage Commission, "because I have no access to large grants or university funds to jet about visiting the Stanford University library, Harvard library, etc., etc., etc. Now those collections are only a few clicks away via Mr. Google and Mr. Gates."

Curcio also points to how digital access even plays a preservation role. "As a collector of maps and a photographer, I find digital the only current way to treat paper based artifacts. Every time an old paper-based map is unfolded or unrolled and exposed to light, it is damaged. Digitized, a paper-based map stays safely stored. I have nearly a thousand historic maps downloaded from numerous archival collections from the Library of Congress to Rutgers Special Collections on my external hard drive. I can reference them any time I need, zoom in and zoom out–even make notes on them! All while the originals remain safe."

"One of the best parts of digital magic is the ability to disseminate," concurs William Neumann, a Rutherford, NJ historian, preservationist and commercial photographer. "Sending and receiving virtual information is revolutionary and frankly, absolutely delicious. But this magic also furthers the probability to preserve itself. By spreading digital information to many locations such as museums, libraries, education centers, researchers, webpages, Facebook groups, blogs and personal hard drives, it

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vastly extends the possibility of future preservation. Dissemination may also add or sometimes subtract value to the information or cause derivative research to result."

While I'm obviously biased, the internet has also permitted a whole new means to get history information out to the public, often in engagingly dynamic forms. True, it also means that misinformation can spread like wildfire along with it. But the printed word isn't exactly immune to such problems either and, it could be argued, online sources are easier to correct once an error has been identified.

I doubt you'd find many historians these days who would argue that the emerging digital paradigms are bad for access to research materials.

Nevertheless, it is still a process of difficult and competing tradeoffs.

Accessing Artifacts in the Digital Age

"Why worry about printing photos on paper?" Curcio asked, an apparently irrepressible champion of the digital domain. "As...long as an image is digital, it remains. With hardcopy publishing fading fast–images now go from digital camera or scanner to computer, electronically inserted into text copy, formatted and published to e-Readers. Paper copy skipped–and rightfully so, as much as I love books. But when I saw that there are college textbooks that cost more than a year's tuition when I was a Rutgers undergrad: Mind = Blown. e-Reader, here I come!"

Others, however, are not so enthusiastic and may even have precedent on their side.

Intel co-founder, Gordon E. Moore, predicted in 1965 that integrated circuit technology would double in capacity roughly every two years for at least the following decade. Known today as "Moore's Law," it proved remarkably prescient. As the theory pushed the physics that underlies computer components, the manufacturing methods managed to keep pace, meaning the computing power in the hands of an iPhone- or Blackberry-user today is proportionally greater than the big honking desk units of even a few years ago–a fact exploited by computer and software makers who constantly work to make the current models obsolete almost as soon as they hit the market. New and faster systems mean new software (or at least upgrades) and even new file formats are possible or required to make the new computer speeds and capacities functional. Moore's Law seems to be starting to slow these days, to doubling every three years. But cutting edge research into nontechnology and quantum computing hold out the

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promise that Moore's Law won't itself become obsolete any time soon.

Fallout from these trends for historians and archivists includes a major concern over the mechanical means by which digitalized materials gets accessed. Think how much that has changed just in the last decade or so–remember 3.5-inch floppy disks? Remember when floppy disks were really floppy? Remember SyQuest, Zip and Jazz drives? How many of us still have the hardware to read those forms of storage?

"A number of librarians have pointed out that books, documents, etc., etc., are essentially passive storage systems while electronic media are active, that is, they require the librarian to periodically update the formats, back up the servers, and take other active steps to insure forward compatibility," commented Kevin K. Oleson. "In theory at least, once a book is on the library shelf, the librarian only needs to insure that the roof does not leak, temperature and humidity are within range, and the fire alarm is operational. There is alas, little chance that important electronic documents will be preserved unless someone takes the time to back them up on a secure server, keeps the server running properly, and insures that the documents are periodically converted to a format that is readable. This is not going to happen unless there is a compelling reason (i.e. money) to do so."

The threat posed to historical records by the inevitable fundamental changes in technology are, in fact, not exclusive symptoms of the digital age. "Sadly, no one ever thought to transfer many silent films from the unstable nitrate film stock to a more stable format," Oleson pointed out, "and we have lost thousands of images from the early days of the movies."

Of course, such problems don't just afflict the history world. It's an issue for a wide range of commercial businesses, industries, institutions, healthcare providers, government agencies, educational institutions, etc., etc., etc. And, that comes back to haunt the history community, since it from that culture-at-large that they draw their artifacts.

"In another instance," Oleson adds, "the BBC routinely recycled their videotape. During the early 1960s videotape was very expensive and the programming department erased it and used it over again. The earliest television appearances of The Beatles were erased to save a few quid. It has been estimated that if those tapes had survived, today they would be worth tens of millions."

"Before I retired I was an engineering manager in a company whose major services were the design and construction of

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power plants," wrote Frank Kowalczyk, Vice President of the Stafford Township (NJ) Historical Society and Trustee with the Ocean County Historical Society. "On one such plant, a nuclear power project that had been in operation for approximately15 years, I led a task to upgrade the power output of the plant. We went to the client's plant location to review our calculations and other related documents to determine what was possible. Our original calculations were performed on paper and were readily accessible and retrievable by reading them in the client's document room. Other critical documents had been transcribed into 3M cassettes and required a cassette reader. We requested the transfer of the cassette information to our offices for more efficient availability to various engineering disciplines. The company that had provided us the original cassette form of documentation had since changed to CD capture of such information and were, at the time of our project, providing information storage at some distant server that could be accessed via the internet. The only cassette reader accessible to us was one that required a toxic chemical to create the hard copy and this was disallowed by recent regulations. The offer of a machine from the information storage company found that even they no longer had such a machine available. And they suggested we take the cassettes to a local library that might have an ancient machine!! Needless to say, we did find what we needed but the lesson was learned. We had no trouble accessing the calculations from our original, hard copy, paper documents. But other digital forms of the information either require maintaining the original readers with whatever digital form information is created and stored. Today, I can read the original Gutenberg bible in print, but require specific computerized readers to access digital information just a few years old. Hallelujah to the digital revolution."

Individuals and businesses don't think about posterity when they use systems of recording stuff. When I take a digital picture–even as someone proud to call myself a History Geek–I admit I'm thinking less about if it will be around a hundred years from now than how cool it is that I can see the results almost immediately–and not spend money on developing like I used to. When the power company Frank Kowalczyk mentions was thinking about storing information, they probably just went with what seemed like the most convenient, modern and economical method at the time. There was certainly no reason they should consider the needs of some historian a hundred years from then who might be researching nuclear power plant design in the 20th century.

As pessimistic as Oleson is ("It does not look promising," he

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summed up), he can point to one example of how it *can* work. "The American Chemical Society for example, does an amazing job of making its old journals available on line," he wrote. "Even when I am doing research on the history of chemistry, I do not have to use the paper archives."

But, in theory, so long as an original hard copy manuscript or a photograph exists–and humans have eyes–they are accessible. What digitalization *does* do it is permit a greater number of eyes to see it, even if they can't be in the same room as the physical material. But so long as that original source material is extant, no matter how much the technology changes, it can always be rescanned or reimaged or resaved in whatever format has become the new standard-*du-jour*.

I say "in theory" because, in practice, it is proving a bit more cumbersome. Even a well-maintained digital archive doesn't mean that the *original* material is still around as a back-up.

"An obstacle I have come across on more than one occasion at a library and also at a building's department," architectural historian and conservator Stephanie M. Hoagland wrote, "is missing information in the digital copy. But when I asked to see the originals, I was advised that the original historic documents were thrown away, once the digital copies were created, to make more room in the archives. Digital copies are made by humans and humans make mistakes, such as cutting off tops, bottoms or sides of pages that don't fit on the scanner, missing a page entirely and copying the adjacent page twice, etc."

Once an original is gone, unless there is another hard copy somewhere else in the world, (that is accessible, as opposed to locked away in a private collection), the missing information is also gone.

Forever.

Is Material Culture a Human Trait?

"Since the Age of Reason, the majority of 'things' preserved have been actively preserved to some degree or another," says William Neumann. "There are many motives that move preservation but one of the most forceful has been the marketplace for information. Unfortunately the greater value of information sometimes tramples over the artifact that contains it. Using digital tools we can now more fully extract virtual information leaving the physical artifact intact and preserved."

The digital realm is a departure from a physical world we've always known and on which we've based all human culture to date. It is a shift that may be even more profound than the questions raised by the history community–and we really haven't

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–Gaye Ingram

experienced anything quite like this before.

"I encourage you to contact someone who is teaching or researching in the field of cognitive brain science, for almost certainly such a person can pinpoint differences in processing that occur between the use of the concrete or material and the use of digitalized means as ways of learning," suggests Gaye Ingram, a 35 years veteran of teaching literature and creative writing, first at the university level and later in a program for gifted learners she established at a private independent school in Louisiana. Approaching the matter from an artistic, literary perspective, she sees material culture as integral to what it means to *be* human. "The very stuff of all art, including literary art, is concreteness." She cites how that "concreteness" is reflected in some of the most important literary works of the Western world–Hamlet with Yorick's skull, for example, or, John Keats and his famous *Ode On a Grecian Urn*. All incorporate physical artifacts as a means of connecting with the past and its lessons.

Bringing the discussion back to where it began, she asserts, "[w]hen we fail to teach handwriting, we will do more than despoil historical records. We will change the brains of citizens, as anyone who has ever read much about creativity or taught creative writing or in-depth thinking via clustering, fast-writing, drawing, etc. will attest. No one loves writing at the computer more than I. It's fast, simple, correctable. But it is not generative–at least for me. Looking at a computer screen is somehow distancing. I'm sure there is a physiological reason for that feeling. Would bet there is. We know so much about the operations of the brain and neurological operations in general now that surely someone has written on this. Or should. I don't think it is simply habit. The pencil is almost an extension of oneself."

She has a point.

When I was researching my last book, "James Parker: A Printer on the Eve of Revolution," among my fondest memories was when I first got to hold some of his actual letters. They existed in two ways–the information they contained and the physical artifacts. Transcribing what they said would make them easier to read and more accessible while not jeopardizing the preservation of the letters themselves. But the real thrill was to see the handwriting–*his* handwriting. He was transformed from being an abstract concept into a human being in every stroke of his pen. When he wrote of pain in his hands from gout, you could *see* it in his scrawl–almost feel it.

The value of the physical was to make a man from over two-hundred years ago human.

Yet, perhaps even here, the digital domain can play a role in

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– William Neumann

a form of preservation of the physical. "Having today's incredible tools presents astounding ways to preserve to 'the best of our ability.'," Neumann suggests. "A major focus should be to choose the best digital methods to render and fully express the *original physical qualities* of an artifact. It is now possible to digitally render the best in clarity, resolution, color fidelity, tactile representation, weight, physical size and context and provenance. Working within these guidelines, we can virtually echo the real, physical qualities of the artifact well into the future while we carefully store the original away."

Where a transcription, for example, of James Parker's letter preserves the data but strips away the "soul," a more sympathetic but still digital approach might create an analog of a fidelity that preserves both. It's all in the way one approaches the problem.

Neumann tries to encourage such thoughtfulness and planning ahead. He tries to tap into the human traits that at the heart of why people consider photographs of family and ancestors precious. And then ask if the images they take today will be around to be appreciated by future generations in the same way. It's all a tradeoff–how much immediate convenience are we willing to give up for long term permanence?

"The innocence of the artifact and the importance of the information is the dance," Neumann offers. "How well we listen to the music and perform the steps is another story."

Tomorrow's Historians

So far, we've been looking at the digitalization of extant historic material. A larger challenge is how to archive what we're leaving behind *now* for future historians–as we increasingly leave less of the physical artifacts and more bits and bytes.

"I have worked for the same company for the past eight years," said Stephanie M. Hoagland. "In that time we have used floppy disks, 3.5-inch floppies, zip disks and now CDs to save our reports and photos off of the main sever." Hoagland works for an architectural conservation firm in Manhattan. In addition to lab analysis of historic materials, they write Historic Structures Reports (HSRs), histories for state and national Historic Register nominations and other material that may very well be of importance to future historians and preservationists. "We have upgraded each of the computers in the office and these computers are no longer capable of reading those first three media types. CDs and DVDs have an estimated life span of 25 years. We have found files saved on the server that can no longer be opened because they were written on an old program. Sometimes these

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can be retrieved by changing the file extension, but most of the time they are unreadable."

Fixing these kinds of issues requires a level of vigilance that many companies and institutions are hard-pressed to afford. Hoagland estimates the firm she works for has accumulated tens of thousands of files in the sixteen years it's been in business. The amount of time and money it would take to inspect and convert all those files would be prohibitive to say the least–and they're a commercial enterprise. When it comes to chronically under-funded non-profit institutions, Hoagland adds, "a lot of libraries, universities and government offices are not going to have the time, money or staff to keep upgrading the format over time. While not necessarily a problem now, this may be an issue in the future."

Solid State

Another problem is that as much as it's a digital age, the technology of storage still relies on the old-fashioned physics of mechanical devices. The hard drive in your computer is still a disk that physically spins. And, the laws of entropy being as they are, moving machines eventually wear out. The Library of Congress has done a lot of thinking about this. They call it "external dependencies," meaning how the data itself is dependent upon specific hardware or software to access or manipulate. They have had a robust digital archive program since 2000, continuing to set standards and address technical issues.

One strategy has been to make use of solid state hard drive technology (SSD)–drives with no moveable parts. While, conceptually at least, SSDs go back to the 1950s, the first practical models came out in the early 1980s and started hitting their stride by the '90s. Head to head, SSDs are far and away superior to the common hard disk drive (HHD)–at least when it comes to archival storage. Access is almost instantaneous since there are no spinning disks that need to rev up or align. They are less likely to be damaged from shock (dropping it), don't physically wear out and malfunction as fast (no moving parts), are not subject to data fragmentation (why you should run "defrag" periodically), and are impervious to magnetic fields that can wipe out data on a traditional hard drive.

There are some downsides, however. I'm not going to get into the differences between Flash-based and DRAM-based memory–largely because I don't necessarily understand it myself. But suffice it to say that the former has a limit on the number of times it can be written to, while the latter does not. If you're just using it to write once and store the data, this isn't as

"A face from the past emerged and digital technology was the hero."

much of a problem as would be if the drive were inside a computer. HHDs can, theoretically, be written to an unlimited number of times. It's the fact that the mechanical bits will inevitably break down that prevents them from doing so. There are also issues with encryption and security matters. It also doesn't help that SSDs simply cost more per gigabyte of space. As of February 2011, SSD costs averaged between $0.90 and $2.00 per GB, compared to $0.05 per GB for a standard 3.5-inch HHD.

But, of all the technology we have at the moment, SSD is the most stable and durable storage available. How long they last depends on how often they're accessed, but that lack of moving parts is what makes them far longer-lived than the HHD. And, SSDs are becoming more common–if you have an iPhone, for example, or a tablet-style computer, it will have an SSD. The Library of Congress is using a multi-tiered approach, encompassing a variety of technologies, and approached things with a well-formed, long-term strategy. And, it doesn't hurt that it's the Library of Congre s s–*the* library in the United States and able to draw of the resources of the U.S. government. Nevertheless, one thing about this technology is that it doesn't stay in one place for long–General Electric is already pitching their holographic-based media to them as the next frontier in archival digital storage.

Digital Photography

There is a photograph in my mother's family album showing my great grandmother with her parents, taken on a rooftop somewhere in turn-of-the-century Brooklyn. One day my mother opened the album to look at it and was alarmed to find it was fading. This was particularly upsetting as it was the only photo we have that shows what my great, great, grandmother looked like. Photos are, after all, chemistry, and, even a hundred or so years later, reactions can still take place that erase precious images. Fearful of losing the picture forever, she took it a local photography studio that offered digital restorations of antique prints. Sometimes it works, he told her, sometimes it doesn't. But, in this case, fortunately, he was able to scan the print and pull out even more detail than we ever even knew was there.

A face from the past emerged and digital technology was the hero.

It could be argued that there isn't much difference between printing an image from a negative and printing it from a digital image–each is going to be vulnerable to whatever limitations are imposed by the chemistry of how that print is made. And, that technology has changed over the years. Yet how many of us

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–Maggie L. Harrer

ever even print out all our digital pictures? How many of the kinds of personal images historians would someday treasure are now sitting on hard drives, on iPhones or on the servers that run Facebook or Flickr? How many of them will still be around or accessible a hundred years from now?

Like those nuclear power plant records earlier, most people don't take personal pictures with a thought as to how they may someday help shape the understanding future historians have of the times we live in. They want the convenience of emailing those pictures of little junior's birthday party to grandma on the other side of the country. They want to throw them up on Facebook where they can be instantly shared with all their friends. Short term immediacy and convenience has its allure.

But, even if one does print out all their digital pictures for posterity, there is some disagreement over how well even that will stand the test of time when compared to traditional photographs.

"Another major problem is that so many folks are using digital photography equipment which has the same problem in terms of changing formats," commented Maggie L. Harrer. "Additionally, the photographs printed these days from digital formats are not being printed any longer in a manner that will last more than 5 to 7 years at maximum. The 'old fashioned' Kodak printing that lasts a very, very long time, even up to 100 years, is no more. So, even if you print out your photos, they will start to fade very, very quickly. I discovered this with some of my daughter's photos taken a mere 5 years ago....they look 150 years old with color faded and images disappearing. So we may lose completely images taken beginning 5 years ago and going forward."

"The [photography] situation is not quite that bad," Tom Judd asserts, however. "Many of us doing fine art photography are printing with pigment inks on acid-free archival paper. These inks have fade resistance up to 200 years, and well-made papers are very long lived. It's ironic to refer to Kodak printing that lasts a long time. For many years Kodak marketed color materials to professional wedding and portrait photographers that had truly terrible fugitive qualities [meaning, according to Miriam-Webster online, "likely to evaporate, deteriorate, change, fade, or disappear."]. I have portraits by a top professional that are essentially worthless 20 to 30 years later. Printing on general store quality paper with machines intended for office use certainly can have problems. But professionally printed archival color prints now have useful liftimes greater than almost any previous processes."

"I'm glad to hear that you are doing that," Harrer responded,

"Digital images are just files and the software algorithms to translate those files into a picture will work on any future hardware."
–Ned Barber

"but the average photographer is not using fine art techniques. Many of the photographs we now treasure as historical records were simply taken by individuals or employees of firms who photographed sites, buildings and individuals. I'm simply noting that these folks are now using methods which you call 'store quality paper with business machines' (as most individuals now use the quick developing methods at local retail stores) which will mean that the many casual photos of people and objects, buildings and events will no longer be around for future historians to reference and study."

Both have their points. The technology *does* exist to make quality images and print them on media that will have longevity on par–or even exceeding–the best of traditional photographic standards. But, for now at least, this is expensive and more the domain of the professional photographer or artist–the exception, rather than the rule.

The situation is, however, not all that different from that which faced traditional photography. Bulky equipment and the need to immediately process plates using caustic chemicals kept photography the tool of professionals and dedicated–and well off–amateurs. It didn't remain there long, however, as manufacturers understood the profits to be made if they could put cameras in the hands of the average person. George Eastman and his Kodaks–using a roll film idea he stole from a Newark, NJ clergyman named Hannibal Goodwin, but that's another story!–was arguably the most successful at capitalizing on the democratization of photography. But there was a vast range of designs and models of small, cheap cameras that took adequate pictures. They may not necessarily have been archival quality–hence my mother's desperate efforts to save that photo–but capturing an image like that was still novel enough that it didn't really matter. Economy, convenience (relatively speaking) trumped quality.

Sound familiar?

So how different *is* the new digital from the old analog? Ned Barber also replied to Harrer, parsing the issue a little finer. "I have to disagree with you on technical grounds. As far as formats go, a bit is a bit. Digital images are just files and the software algorithms to translate those files into a picture will work on any future hardware. The storage those files reside on may change, but unlike physical prints you can easily copy a digital image from one storage medium to a new one with 100% fidelity. And the cost is only the cost of the new medium. It is also simple to have multiple copies of digital images stored in multiple locations which protects collections from catastrophic destruction. As

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–Janet Sheridan

far as the durability of prints from digital images, when I need an old fashioned photographic print for some long term purpose, I upload the image to the Costco photo center and an hour later I can pick up a print that has gone through the same chemical process that Kodak used to provide. The only difference is the way the images was exposed onto the paper. The digital domain is a boon to history and historians."

Within the community, we can, of course, establish, promote and adopt some "best practices" for making digital records of our times that will most-likely still be accessible by future generations of historians. "For digital photo printing, to achieve acceptable long-term durability, the easiest thing to do is follow the new guidelines put out by the National Register of Historic Places at http://www.cr.nps.gov/nr/publications/guidance/Photo_Policy_final.pdf" suggests Janet Sheridan. The National Register has embraced digital photography as a valid tool for recording sites–provided some basic standards are followed. The TIFF (for Tagged Image File Format, also called TIF) format is preferred over the more common JPEG (for Joint Photographic Experts Group, who established the standard, also called JPG). Resolution should be six megapixels or better. CD or DVD is the preferred means of storage and they have standards for even naming files and labeling the physical disks.

Standards are also given for printing. "Choice of ink jet machine, media and ink determines durability, which varies immensely, although the market has responded well to the need," Sheridan continued. "The widely-accepted authority on the permanence of color photographic materials is Henry Wilhelm, whose independent testing can be found at http://www.wilhelm-research.com/"

And there is room for hope. During the initial explosion of digital photography, the rush to market meant lots of low resolution images and few affordable accessories like quality printers, inks and paper. There will always be cheap stuff out there, but manufacturers seem to understand that when it comes to family pictures, there is still a tacit desire for permanence. It's human nature that we find it cool to see photos of long-dead great, great grandma or what our neighborhood looked like a hundred years ago. And, we still would like to think that our pictures today will be similarly as engaging to future generations–even if it's just being able to embarrass your son or daughter by dragging out their baby pictures at family get-togethers. Having them on your computer is, perhaps, akin to having the negative. There remains a tactile charm in having a physical print in an album or a wallet. The result? Reasonably permanent inks and

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paper are increasingly part of the industry's mass market share.

Assuming some basic care is taken in printing from a digital file and the results are stored under proper conditions (no long exposure to strong light, not subjected to harsh amounts of moisture or temperature ranges), it is reasonable to assume prints made from digital sources can have a life expectancy akin to their analog photography counterparts. The trick, however, is to keep encouraging the public to take such matters into consideration. So long as there is a market, manufacturers will meet the demand.

Adapting

One thing seems certain–digital culture, whether we're happy about it or not, is here to stay and will be the standard for a long time to come. At least until it gets replaced by some new paradigm that is as unimaginable for us now as an email would have been for Ben Franklin.

To varying degrees, historians, archivists, preservationists and librarians have begun to rise to the challenges this presents. After all, that's sort of our job–to find the means by which to preserve artifacts so people now and in the future can learn from them. Adapting to the changes of the digital age is, in effect, critical to living up to our collective mission.

If you've ever sent a Twitter message, congratulations–you are now in the Library of Congress. Yup–the venerable LOC has been collecting and storing *every* Tweet ever tweeted since the service came online in March of 2006. And, with an estimate 50 million such tweets *each day* to say that's a lot would be an understatement. Yes, much of it will indeed be the inane chatter we probably fear it is. But, then again, for better or worse, it *is* reflective of where our culture happens to be at this point in history. And in some instances, Twitter has not just reflected history, but made it. For example, when he was arrested for covering an anti-government protest in Egypt on April 8, 2010, photojournalist James Buck tweeted just a single word–"Arrested." Word spread from there, exponentially, amongst his family and colleagues. That single word tweet is now credited as being the match that lit Egypt's revolution, ending the thirty-year reign of Hosni Mubarak and a critical part of the so-called "Arab Spring" that has changed the Mideast sociopolitical landscape forever.

With apropos understatement, when he was at last released a year later, Buck simply typed, "Free."

Understanding the cultural importance of the internet to their core mission, the Library of Congress has also been making an active effort to harvest and save the content of Presidential and

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Congressional websites since the 2000 presidential election. According to Library of Congress blogger, Matt Raymond on April 14, 2010: "Today we hold more than 167 terabytes of web-based information, including legal blogs, websites of candidates for national office, and websites of Members of Congress."

Though they are secretive about what they consider proprietary information, it is rumored that internet juggernaut Google is the ultimate of internet packrats, holding onto archived "snapshots" of the entire internet–hence their ability to provide their groundbreaking search engine. It is in of itself, arguably, an archive of digital culture from the internet.

However, where Google takes their snapshots to support their engines for commercial purposes, Internet Archives operates on a more altruistic model. Housed these days in a former Christian Science church, Internet Archives (www.archive.org) was created as a non-profit in 1996 by computer engineer and "digital librarian," Brewster Kahle. "Most societies place importance on preserving artifacts of their culture and heritage," they say in the mission statement from the site. "Without such artifacts, civilization has no memory and no mechanism to learn from its successes and failures. Our culture now produces more and more artifacts in digital form. The Archive's mission is to help preserve those artifacts and create an Internet library for researchers, historians, and scholars."

One advantage of such an archive is that you can, large as it is, make copies in other locations to protect against catastrophic loss–something impossible with a physical collection. There is a mirror of their collection at the Bibliotheca Alexandrina–a world-class library and cultural center, fittingly located in Alexandria, Egypt, home of the lost great Library of Alexandria of antiquity.

Adapting from an analog paradigm to a digital on that scale is sometimes more than just about what kind of file format or storage means–sometimes, the lawyers get involved. Similar to the often messy fights in the music industry over ownership rights and control of creative property with the advent of downloadable content, Internet Archives has had its share of copyright and trademark infringement challenges. In 2005, members of the Grateful Dead sued to have concert materials pulled, but later reached a compromise permitting audience-recorded material to be posted. But sometimes it can go beyond the nuances of copyright law and veer into real ethical dilemmas. In 2002, lawyers for the Church of Scientology were successful in having material critical of them removed from the site. In 2007, the FBI sent Internet Archives a demand for log records of an undisclosed

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–Elizabeth Dowd

user in the form of a "National Security Letter" (NSL)–demands for information that are not subject to judicial approval. Lawyers for Internet Archives challenged the order under the provisions of the reauthorized U.S.A. Patriot Act, claiming the same immunity extended to traditional libraries. They also claimed that the gag order against them divulging that the NSL even existed was unconstitutional. In 2008, the FBI withdrew the NSL–only the third instance they had ever done so up to that time.

There are non-profit groups which advocate for universal free access to all digital content available in the public domain–essentially creating a single, global archive of digital culture. Among them are Open Content Alliance and the International Internet Preservation Consortium, who seek to pool the resources of computer engineers, librarians, archivists and scholars to that end. Obviously, there will no doubt be a mire of copyright and trademark laws–which differ in different countries–to wade through. But in these enterprises we might just be glimpsing the future of how we handle digital culture.

Closer to home, New Jersey has begun its own evolutionary process of handling our digital culture. "We are actually very lucky here in NJ," Elizabeth Dowd from New Jersey Parks and Forestry pointed out. "Our state has the well-developed, yet under-utilized New Jersey Digital Highway (www.njdigitalhighway.org). The NJDH is an incredible repository for historical and cultural collections in our state. The NJDH Mission Statement includes, 'Preserving the state's cultural resources and artifacts for use by current and future generations of citizens, educators, researchers and students through rigorous digitization strategies and sophisticated storage and access technologies. Resources are available 24/7 and maintained in perpetuity."

Dowd points out the importance of that bit about "in perpetuity"–how that mandate is what "makes this digital archive so great." She admits that "[t]his may not help anyone with their digital family photos–a good photographer or old-fashion camera shop would be best with that. But it does help those of us looking to preserve historical information for use by the public. Here in the State Park Service, we are involved with the NJDH as we try to make many of the documents housed at the Grover Cleveland Birthplace more accessible for researchers."

The website is indeed a promising resource and deserves to be used more.

On an even more local scale, in 2009 the Woodbridge Township Public Library added a page to its website to allow patrons to access digitized local newspapers with financial help from a Middlesex County Cultural and Heritage Commission

"It's a new world emerging but I assume we will survive it, just as we survived the telephone."

–Gordon S. Wood

grant (www.archive.woodbridgelibrary.org/Archive/). It makes use of Adobe PDF software and, at first, the search engine was a little crude. The limitations of optical character recognition technology on indistinct text in the originals often resulted in garbled text. While there are still some issues, the librarians who maintain it have worked hard ever since to make it a *lot* better. Thanks to Councilwoman Brenda Velasco's interviews with longtime residents, there is now also a page with dozens of audio files of oral histories available as well as history-related videos from the local public access television station.

Other communities, such as Mays Landing and Atlantic City, have also begun similar programs. The technology is out there, but the limits of budgets and manpower often mean smaller institutions will always lag a bit in implementation.

Conclusions

There is an episode of the classic sci-fi television program, "The Twilight Zone," titled, "The Obsolete Man," that first aired June 2, 1961. It starred a young Burgess Meredith as a librarian–aptly named Mr. Wordsworth–living in some future totalitarian state worthy of Orwell. He appears before a tribunal and is declared "obsolete." His life is to be terminated. There are no more books in that future–at least no physical books. So Mr. Wordsworth is an anachronism that no longer contributes to society. It was meant as a statement on totalitarianism, euthanasia, collectivism–even religion. Yet the writer (and host), Rod Serling, probably didn't realize he was being prescient in a very different way.

Okay, so maybe we're not yet to the point where the tactile pleasures of a book are so long forgotten that librarians are put to sleep–underfunded and underappreciated, perhaps, but not euthanized. But there seems no stopping the shift into a world of digital culture–and, I'm not entirely convinced one would want to if it were even possible.

Still, there is still something sad in the idea that cursive skills may become obsolete–not merely out of nostalgic inertia to change, but because a link to the past may very well break in the process.

"You raise interesting issues," Gordon S. Wood replied. "My daughter just told us that her children no longer are taught cursive writing and thus cannot read much of what their grandparents write in birthday cards, etc. If they should want to become historians and need to read the manuscripts of people in the past several centuries they will have to learn how in just the way we have to learn some Latin to read writings in the more distant

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past. It's a new world emerging but I assume we will survive it, just as we survived the telephone."

At the end of the day, there is no "perfect" answer to the questions the digital age poses for us. I can think of many instances where artifacts have been "repaired" or "preserved" by past generations of well-meaning people, using what was, for the time, perfectly legitimate "best practices." Now, we shake our heads and wonder if it is possible to undo the unintended damage. Future historians may very well wonder what the heck we were thinking when we decided to print out pictures on *that* paper or save our email texts in *that* format. Mistakes no doubt have and will be made.

Nevertheless, from international consortiums to local libraries, history is being pulled–even dragged–into this brave new world of digital culture. I think New Jersey's historians, archivists, librarians and preservationists will be up for the challenge.