The Old and New of Digital History

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Abstract

This article reflects on the expectations and changes that digital technologies have brought to history, activities that are increasingly codified as digital history. Because of the breadth of digital technologies and communicative media, the contours of a digital history are still unclear, so I frame my discussion with two potential narratives that begin from different ideas that emerged from World War II weapons research. One narrative begins with Roberto Busa and the application of a computer to find concordances in the writings of Saint Thomas Aquinas. The emphasis here is on the application of computer technologies to the practice of history. The second narrative begins with Vannevar Bush's essay "As We May Think" and focuses on digital technologies as a key element in an information system. This beginning invites a parallel between inscription technologies (especially the movable-type press) and knowledge systems. Both narratives imbibe the modern faith in technology to improve; the "new" is better, but the latter better involves humans and societies. Despite important differences between them, both narratives lead to an inquiry into the foundations of our modern knowledge system. In the case of history, the question is whether a knowledge system that was developed in the nineteenth century and designed to encompass and order the world into one system is still apposite in our digital world. I close by suggesting that one such presumption that needs to be reconsidered is the idea of the past as a prior and distant timeform. A shift from "the past" to "pasts" opens history to a broader field of previous happenings and a reconsideration of chronological time, of change, and to other modes of transmission, such as storytelling.

Keywords: digital history, newness, past, multiple times, structures of repetition, information systems, communication, first principles

[1] I would like to thank Ethan Kleinberg for his request, support, and advice throughout the rather short writing process. This article brings together ideas with a meandering past. My interest in digital media was guided by the late Jan Reiff, my muse in digital scholarship, history, and UC politics. We met as graduate students; she was carrying punch cards. Helge Jordheim and Espen Ytreberg created the wonderful intellectual environment at their project, "In Sync: How Synchronisation and Mediation Produce Collective Times, Then and Now," at the Centre for Advanced Study at the Norwegian Academy of Science and Letters. My stay encouraged and gave me confidence to move deeper into an idea, history as media. The advice and suggested readings from Geof Bowker were too numerous to acknowledge individually; his impact permeates this article. And finally, a conversation with Pamela Lach set me off on a good direction, and the advice from Paul Evans on an earlier draft was invaluable.

More than thirty years have passed since computer technologies were first applied to history (and the humanities).[2] The transition has been immense; it is another example of individuals and institutions imbibing the promise of the "new"—machines, electricity, and electronics—in the hope of improving work, lives, and society throughout the twentieth and twenty-first centuries. Few scholars will miss the "old"—typewriters, correction fluid, rotary dial phones, carbon paper, and months (and more) spent searching, traveling, locating, and copying material from libraries and archives. Such technological development provides evidence for the historical thinking of our modern world based on linear, progressive time and now seems to recapitulate the idea of progress.

Over the past decade, a number of essays and books have tried to describe and evaluate the potential and application of digital technologies to the writing of history.[3] Most extol the newness

[2] Of course, a proper history would go back further to cliometrics, which emerged in the late 1960s. Here, I am thinking of some key founding institutions: the American Social History Project (1981), which expanded into the American Social History Project/Center for Media and Learning (ASHP/CML); the Institute for Advanced Technology in the Humanities (1992); and the Center for History and New Media (1994), which is now the Roy Rosenzweig Center for History and New Media.

[3] The classic introduction to digital history is Daniel J. Cohen and Roy Rosenzweig's *Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web* (Philadelphia: University of Pennsylvania Press, 2006). A somewhat crowd-sourced (via a call for papers) effort that illustrates the vast range of possible applications is *Writing History in the Digital Age*, ed. Jack Dougherty and Kristen Nawrotzki (Ann Arbor: University of Michigan Press, 2013). Two recent works that assess the value and limitations of digital media on historical research are Lara Putnam, "The Transnational and the Text-Searchable: Digitized Sources and the Shadows They Cast," *American Historical Review* 121, no. 2 (2016), 377–402, and Ian Milligan, *The Transformation of Historical Research in the Digital Age* (Cambridge: Cambridge University Press, 2022). Other recent examples are: *Digital Medieval Studies—Practice and Preservation*, ed. Laura K. Morreale and Sean Gilsdorf (Leeds: Arc Humanities Press, 2022); *Digital Methods in the Humanities: Challenges, Ideas, Perspectives*, ed. Silke Schwandt (Bielefeld: Bielefeld University Press, 2020); Models of Argument-Driven Digital History (website), Roy Rosenzweig Center for History and New Media, George Mason University, accessed 23 August 2022, https://model-articles.rrchnm.org/; Hannu Salmi, *What Is Digital History?* (Medford: Polity, 2021); "AHR Exchange: Reviewing Digital History," *American Historical Review* 121, no. 1 (2016), 140–75; *Digital Histories: Emergent Approaches within the New Digital History*, ed. Mats Fridlund, Mila Oiva, and Petri Paju (Helsinki: Helsinki University Press, 2020); and Jane Winters, "Digital History," in *Debating New Approaches to History*, ed. Marek Tamm and Peter Burke (London: Bloomsbury Academic, 2019), 277–89.

that digitalia brings to historical work; but what difference does this technology bring? The "new" can be more of the same, but enhanced as "more-faster-better,"[4] or it can be different, even transformative. A look beyond the rhetoric raises a seemingly paradoxical condition of such linearity. While the claim to newness characterizes modernity (Reinhart Koselleck called this *Neuzeit*), this claim demands something previous, possibly pasts, the past, or history.[5]

I wonder to what extent this surge of writings on digital history is the result of a combined sense of accomplishment and angst over the value of those accomplishments. The former is tied to the considerable effort required to shift the academic work of humanists—including their tools, infrastructure, and standards—from analog to digital. The uncertainty might reflect worry about what comes next or, more skeptically, about what (besides the tools) has changed. I, too, believe strongly in the transformative forces of digital media. But I prefer to think of something like history and digital media (or history in the digital age) rather than digital history. These are not exclusive, but I read a difference of emphasis whereby digital history becomes a more technological instantiation of history, while history and digital media suggests a broader communicative system.

My argument is that the discipline is still in the early stages of adoption, and society, too, is still struggling with this transition. As we proceed, historians (not just digital historians) also need to inquire into the noun in the term "digital history" and not just the adjective. To suggest different potential narratives for a history of digital history, I will offer two beginnings that emerged from similar technological breakthroughs during World War II; both are used today.[6] What I have called Origin I is common in the digital humanities and digital history; Origin II is

[4] David M. Levy, "No Time to Think: Reflections on Information Technology and Contemplative Scholarship," *Ethics and Information Technology* 9, no. 4 (2007), 242–44.

[5] See, for example, Reinhart Koselleck, "'Neuzeit': Remarks on the Semantics of the Modern Concepts of Movement," in *Futures Past: On the Semantics of Historical Time*, transl. Keith Tribe (Cambridge, MA: MIT Press, 1985), 231–66, and Peter Osborne, "Modernity Is a Qualitative, Not a Chronological, Category," *New Left Review* 1, no. 192 (1992), 65–84.

[6] In his fine history of digital history, Adam Crymble similarly suggested two potential origins: Father Roberto Busa and Frank Lawrence Owsley, who published *Plain Folk of the Old South* (Baton Rouge: Louisiana State University Press, 1949), in which he used Hollerith punch cards to manage census and tax data in his analysis of class structure. Crymble differentiated between a focus on language (and, eventually, cultural analytics) and statistical approaches that are closer to the social sciences and quantification. See his *Technology and the Historian: Transformations in the Digital Age* (Urbana: University of Illinois Press, 2021), 17–19.

common in the information sciences.[7] But both of these origins eventually call into question the continued efficacy of modern history itself: whether the knowledge system that emerged in the nineteenth century to order the world into a single framework is still able to encompass the expanded pasts of the digital age.

HISTORICAL NARRATIVE: ORIGIN I

A common origin for the digital humanities and history is the remarkable insight (and salesmanship) of Roberto Busa, who, in 1949, convinced Thomas Watson to use the IBM Selective Sequence Electronic Calculator (SSEC) to find concordances in the writings of Saint Thomas Aquinas.[8] The first demonstration occurred in 1952. This origin emphasizes the computer as a tool that enhances a method of the humanistic research enterprise—that is, mining texts through pattern recognition and mapping. The search for concordances was not new; the speed and accuracy were. By beginning the narrative with the *Index Thomisticus*, the emphasis is on the technology; the "new" is some (digital) enhancement of the existing (analog) practices, which have now become "old." The optimism for improvement via computer technology is evident in Daniel J. Cohen and Roy Rosenzweig's important overview of digital history. Digital technology enables historians to "do more, reach more people, store more data, [and] give readers more varied sources; [with it,] we can get more historical materials into classrooms, give students more access to formerly cloistered documents, hear from more perspectives."[9] The *Index* locates digital history in a century-long promise of technology—"more-faster-better." In the application of digital methods to history, the teleology remains, but the technological transition slips from object of study to practice of scholars. Following Cathy N. Davidson's discussion of Humanities

[7] I prefer to treat digital history as a subset of the digital humanities. The literature on the digital humanities is vast. A good start today is the series of books titled *Debates in the Digital Humanities* (2012, 2016, and 2019). For an argument on the difference of digital humanities and digital history, see Stephen Robertson, "The Differences between Digital Humanities and Digital History," in *Debates in the Digital Humanities 2016*, ed. Matthew K. Gold and Lauren F. Klein (Minneapolis: University of Minnesota Press, 2016), 289–307.

[8] Steven E. Jones, *Roberto Busa, S.J., and the Emergence of Humanities Computing: The Priest and the Punched Cards* (New York: Routledge, 2016).

[9] Cohen and Rosenzweig, *Digital History*, 7.

1.0 and 2.0, we might call this Digital History 1.0.[10] This is the current strength of digital history: tool development, digitization, the search for patterns in large datasets (for example, the adoption of Franco Moretti's distant reading), and aids for circulating work.

But the considerable achievements of Digital History 1.0 return us to the question of transformation, of whether history is different, "new," or whether the "new" is a technologically enhanced practice. It leads to a question, here issued by Johanna Drucker: "After several decades of digital work, the question remains whether humanists are actually doing anything different or just extending the activities that have always been their core concerns, enabled by advantages of networked digital technology (easier access to primary materials, speed of comparison, searching, etc.)."[11] Numerous essays explaining the contributions of digital history inadvertently support this question when they assert a "new" something—for example, new empirical historical knowledge, new tools and digital methodologies, new digital resources, new research approaches, and new understandings of the past.[12] Digital historians have made remarkable, sometimes heroic, strides transforming practices, systems, and even institutions from analog to digital. But what is new about this new? Many scholars recognize the limitations of the emphasis on technology and seek some next step. Lauren Klein has argued that more is needed: "the time has now come for digital humanities practitioners to more forcefully theorize the knowledge claims they make."[13] Digital historians recognize the digital of "digital history" as an ongoing process and state a desire to do more. Jane Winters has reflected on the limitation of this emphasis on tools: "All of this suggests that the digital historian may be so busy learning new skills, struggling to keep up with new types of data and new types of tools, that they will have little time

[10] Cathy N. Davidson, "Humanities 2.0: Promises, Perils, Predictions," in *Debates in the Digital Humanities*, ed. Matthew K. Gold (Minneapolis: University of Minnesota Press, 2012), 476–89. Humanities 1.0 is oriented around data collection (textual and multimedia), archiving, and manipulation, and Humanities 2.0 is connected to the rise of social media and leads to networked, collaborative, and interactive exchange. For a different periodization of digital history, see Douglas Seefeldt and William G. Thomas, "What Is Digital History?" *Perspectives on History*, 1 May 2009, https://www.historians.org/publications-and-directories/perspectives-on-history/may-2009/what-is-digital-history.

[11] Johanna Drucker, "Humanistic Theory and Digital Scholarship," in Gold, *Debates in the Digital Humanities* (2012), 85.

[12] For a reflection on his own use of the adjective "new" as an empty signifier, see Cameron Blevins, "Digital History's Perpetual Future Tense," in Gold and Klein, *Debates in the Digital Humanities 2016*, 316.

[13] Lauren F. Klein, "The Image of Absence: Archival Silence, Data Visualization, and James Hemings," *American Literature* 85, no. 4 (2013), 668.

to do the groundbreaking research that has been the tantalizing promise of digital history from the outset."[14] Stephen Robertson and Lincoln Mullen have begun a series, Models of Argument-Driven Digital History, calling for "argumentation" in digital history.[15] Miriam Posner has argued that the digital humanities should delve into the ways that knowledge and data are used to order things and people in modern society.[16]

This desire to do more returns us to the dichotomy of new and old. Fulfilling the promised transformation of history requires some specification of newness. The claim of the new is old; in his history of the new, Michael North traced the idea that "nothing comes from nothing" to Parmenides.[17] This simple statement raises a difficult question about change. The new comes from existing practices, structures, and knowledge systems. While it marks a difference from the "old," the "new" can be more of the same, different, or transformative. North pointed out that even when innovation is desired, it "is ruled by habits of thinking."[18] I prefer to broaden these habits to what Koselleck called "structures of repetition."[19] Habits and structures overlap, and the difference might be rhetorical, but the latter are mutable, recurring structures that are less domesticable and less able to be dismissed as states of mind, such as old-fashioned or conservative. I will discuss these structures of repetition more later; here it is important to recognize that unspecified claims to the new depend on the same narrow causal thinking that minimizes the multiple times (individual, social, organizational, technological, et cetera) that make up those structures of repetition. Specifying the nature of the "new" intrudes into the very system within which history operates.[20]

[14] Winters, "Digital History," 286.

[15] Stephen Robertson and Lincoln Mullen, "Arguing with Digital History: Patterns of Historical Interpretation," *Journal of Social History* 54, no. 4 (2021), 1005–22. The articles with annotation are available at https://model-articles.rrchnm.org/.

[16] Miriam Posner, "What's Next: The Radical, Unrealized Potential of Digital Humanities," in Gold and Klein, *Debates in the Digital Humanities 2016*, 32–41.

[17] Michael North, *Novelty: A History of the New* (Chicago: University of Chicago Press, 2013), 20.

[18] Ibid., 36.

[19] Reinhart Koselleck, "Repetitive Structures in Language and History," in *Performing the Past: Memory, History, and Identity in Modern Europe*, ed. Karin Tilmans, Frank van Vree, and Jay Winter (Amsterdam: Amsterdam University Press, 2010), 51–66.

[20] Alan Liu identified a similar antipathy in the digital humanities in his "Where Is Cultural Criticism in the Digital Humanities?" in Gold, *Debates in the Digital Humanities* (2012), 490–509.

The ubiquity of digital media and the centuries-long acceptance of technology as improvement has obscured our ability to see technology's tendency to also maintain the status quo. For example, in his 1950 fantasy of life in fifty years, Waldemar Kaempffert envisioned food made from sawdust, shopping from home by picture-phone, microwave cooking, disposable dishes (they melt in 250 degrees Fahrenheit superheated water), and waterproof homes that can be cleaned with a hose.[21] Many of his predictions are now common; others are fanciful. Kaempffert's image of a housewife cleaning the house by washing everything with a hose depicts the possibility of technological innovation to maintain the existing structure. The miracle of modern materials makes housework easy; the woman is still a housewife.[22] The advancement of technology also reinforces social time.

We can dismiss such views as those of outmoded attitudes from more than seventy years ago, but, today, Big Data algorithms continue to reinforce previous (thought to be outmoded) discriminatory practices and racist and sexist stereotypes.[23] Claus Pias has identified the tense of Big Data as the future perfect. He has described how predictive research in datacentric fields (such as Big Data) depend on models (from previous behavior) and data from the past: "It suddenly seemed conceivable . . . to program 'conscious human targets' that, so long as the appropriately oriented mechanisms of communication and control are in place, would always already have been met. The tense of cybernetics would thus be something like the future perfect: Everything will have been."[24] The "new" predictive algorithms are replicating the existing, or even prior, conditions.

[21] Waldemar Kaempffert, "Miracles You'll See in the Next Fifty Years," *Popular Mechanics*, February 1950, 112–18, 264, 266, 270, 272. Interestingly, Kaempffert eschewed nuclear power as too costly and predicted solar power. He was the first director of the Museum of Science and Industry in Chicago and an accomplished science writer; for example, he wrote for *Scientific American* and *The New York Times*.

[22] The patriarchal ideology becomes even more apparent when we remember that a major concern during the immediate post–World War II years was unemployment of returning soldiers. One solution was to return women to the home; another, which has benefited academia, was the GI Bill.

[23] See, for example, Wendy Hui Kyong Chun, *Discriminating Data: Correlation, Neighborhoods, and the New Politics of Recognition* (Cambridge, MA: MIT Press, 2021); Safiya Umoja Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism* (New York: New York University Press, 2018); and Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven: Yale University Press, 2021).

[24] Claus Pias, "The Age of Cybernetics," in *Cybernetics: The Macy Conferences, 1946–1953*, ed. Claus Pias (Zurich: Diaphanes, 2016), 20–21.

Technological change as improvement is only linear, "new," if one reduces the field of vision to a narrow process. This image of an easier world for the housewife is, I believe, an example of Digital History 1.0: it claims newness, innovation, and improvement while reinforcing existing (though possibly enhanced) categories, frameworks, and practices. Interestingly, the humanities' centuries-long interest in the impact of technologies and science on society tends to be backgrounded in favor of hoped-for benefits of the digital transition. We should all remember that one effect of the continued focus on technological innovation as the way to improve society has been an acceleration of life and work, or what Hartmut Rosa has called "frenetic standstill."[25]

HISTORICAL NARRATIVE: ORIGIN II

A different beginning to digital history can be Vannevar Bush's classic essay "As We May Think," which was published in 1945.[26] Like the SSEC, Bush's Memex is also a product (this time imagined) of the scientific and computational research from World War II. Bush was director of the Office of Scientific Research and Development that coordinated the United States' effort to employ scientists for the development of weapons during World War II. (The Manhattan Project was part of his portfolio.) The Memex is an imaginary machine (a compressed information system) that uses advanced contemporary technologies (microfilm, dry photography, cathode ray screens, vocoder, data management, and "rapid electrical counting") to solve a growing problem for researchers: information overload.[27] It is easy to imagine the Memex as a (clunky) precursor to the internet.

Like those in Origin I, Bush exudes optimism for technology's power to transform knowledge. He wrote: "Thus science may implement the ways in which man produces, stores, and consults

[25] Hartmut Rosa, *Social Acceleration: A New Theory of Modernity*, transl. Jonathan Trejo-Mathys (New York: Columbia University Press, 2013), 15. Levy's "No Time to Think" is a wonderful reflection of the acceleration of work at the research university.

[26] Vannevar Bush, "As We May Think," *Atlantic Monthly*, July 1945, 101–8. This essay was edited and republished in the 10 September 1945 issue of *Life Magazine* (pages 112–14, 116, 118, 121, 123–24). The difference between the version published in *Atlantic Monthly* and the version published in *Life Magazine* is fascinating; the *Life Magazine* edition is almost a print version of a website with images, excerpts, and advertisements.

[27] Ibid., 104.

the record of the race."[28] These origin myths are not deterministic or exclusive. Busa's *Index Thomisticus* fits within the Memex vision, but it is a partial instantiation of Bush's broader communicative system with which humans "produce, store, and consult." History in Origin I is the past from which data is extracted to write about that past; history in Origin II is that past *and* the process in which humans, including historians, play a central role. It is one thing to study something fixed; it is more complex (connection to humans, society, institutions, and environments) to be actors, participants, and recorders of the transformation.

Even though I call "As We May Think" an originary moment, "the record of the race," suggests that the Memex fits within a longer history wherein technologies of preservation, storage, retrieval, and transmission have had a long and intimate connection to knowledge in societies. Socrates, for example, complained that writing would lead to a shallower understanding wherein people would be "wise in their own opinion instead of wise."[29] In her history of the printing press, Elizabeth L. Eisenstein contextualized Socrates's complaint: "My working hypothesis is that all views of history have been fundamentally shaped by the way records are duplicated, knowledge transmitted, and information stored and retrieved."[30] The "new" is not the digital in contrast to the analog; it is a recurring process whereby some technology—marking, writing, printing, digital—leads to different practices of recording, categorizing, and dissemination. If Eisenstein's statement is correct, as I believe it is, then histories following the proliferation of digital media will be different than current modern history. It is less a question of replacement and more a question of how history will adapt.

Placed in this broader milieu and deeper past, digital media has an earlier parallel: the movable-type press. The revolutionary changes that are often attributed to the movable-type press began before the fifteenth century, during the Renaissance. The proliferation of books accelerated

[28] Ibid., 108. Bush's impact on academia is far greater than this idea. This essay was a public call for the postwar continuation of federal support of basic scientific research, and in 1950, the National Science Foundation was founded. This was a critical early moment in the growth of US universities as research institutions.

[29] Plato, *Phaedrus*, transl. James H. Nichols Jr. (Ithaca, NY: Cornell University Press, 1998), 86 (275b).

[30] Elizabeth L. Eisenstein, "Clio and Chronos: An Essay on the Making and Breaking of History-Book Time," *History and Theory* 6, Beiheft 6 (1966), 40.

changes that often occurred centuries later.[31] Of course, modern society is accelerated and changes will be compressed, but we should be mindful of this antecedent. Following the introduction of the movable-type press, new books printed existing content (primarily bibles and books on occult and alchemy). As more material circulated, comparison became easier and often gave rise to doubt and challenges to inherited knowledge. Previous authority structures lost their monopoly over information and interpretation, and reading (rather than listening) became an important mode of information dissemination. The decline of orality, which was accelerated by the press, changed how people learned, knew, and remembered.[32] Printed information was more detached from communities of transmission. Competition for sales (attention) led to finding aids, such as title pages, pagination, tables of contents, indexes, modes of categorization (for example, alphabetization), and protection (for instance, copyright). Marketing tools such as prefaces and blurbs boasting of improvement, book catalogs, and reference works increased. By the nineteenth century, modern disciplines such as history and the modern university emerged as "technologies" to organize and manage this growth of information.[33] In short, the meaning of "pasts" changed following the proliferation of the movable-type press; today, digital media might also be ushering in other ways of knowing.

These changes, unlike the *Index Thomisticus*, show the centrality of humans; in Origin II, printers, scholars, and publishers (and pirates) are central actors in this transformation. The movable-type press, like Bush's inclusion of the computer, is but one (important) part of several nascent technologies that were connected to create a multipurpose storage, indexing, retrieval, recording, and sharing system. In *Digital Medieval Studies*, Laura K. Morreale and Sean Gilsdorf rightly pointed to historians' decisions to adapt or refuse technologies. It is not whether historians are right or wrong, progressive or conservative, but that selection is part of a process of

[31] Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven: Yale University Press, 2010); Elizabeth L. Eisenstein, *The Printing Revolution in Early Modern Europe*, 2nd ed. (Cambridge: Cambridge University Press, 2005).

[32] M. T. Clanchy, *From Memory to Written Record, England, 1066–1307* (London: Blackwell, 1993).

[33] For history as central to a knowledge system that emerged during the Enlightenment, see Clifford Siskin, *System: The Shaping of Modern Knowledge* (Cambridge, MA: MIT Press, 2016). For the institutionalization of this system as the modern university, see Chad Wellmon, *Organizing Enlightenment: Information Overload and the Invention of the Modern Research University* (Baltimore: Johns Hopkins University Press, 2015).

transformation. Morreale and Gilsdorf recognized what should be obvious (but is often overlooked): the application of the digital media (indeed, any new technology, widget, or idea) occurs through the existing knowledge system and practices. History, too, as inherited knowledge and experience, is an active part of the process. According to Morreale and Gilsdorf, "we as a field have come to our current state of digital integration slowly, adopting and rejecting certain technologies along the way insofar as they do or do not meet our research needs."[34] Here, Morreale and Gilsdorf point to the centrality of social actors operating in different, layered time systems. This multilinear process was studied by Rob Kling, a pioneer in the study of computers and social change. At a moment of utopian predictions, Kling delved into the various ways organizations adopted computers in the workplace. A gross simplification of his varied and detailed case studies is that, in contrast to the seductive promise of the new technology (again, "more-faster-better"), the actual results showed that technologies might enable some improvement or new, maintain the status quo, or foster greater dysfunction. Outcomes depended on existing practices, understanding, and stewardship of the new technologies.[35] Kling showed that it is necessary to consider to whom, for whom, and for what purpose technology is being applied.

Bringing the social into this inquiry introduces variability. Individual, social, institutional, and disciplinary goals and practices often differ. This is reflected today as so much of digital media in history has been parceled up into various silos of the existing academic productive process. Often, "structures of repetition" (disciplinary practices) orient the adaptation of "new" technologies to reinforce and enhance existing practices, categories, and institutions. The archives have expanded from documents to include databases and data repositories; access is now online. Research is still premier and must use some cutting-edge concept or methodology; in the case of digital history, this means using topic modeling, mapping, and algorithms. The emphasis on data in digital history seems to have been a way to reclaim "facts" and objectivity in history

[34] Laura K. Morreale and Sean Gilsdorf, "Introduction: The Medievalist, Digital Edition," in Morreale and Gilsdorf, *Digital Medieval Studies*, 4.

[35] *Computerization and Controversy: Value Conflicts and Social Choices*, ed. Rob Kling, 2nd ed. (1991; San Diego: Kaufmann, 1996). See especially Kling's "The Seductive Equation of Technological Progress with Social Progress" (22–25) and "The Centrality of Organizations in the Computerization of Society" (108–32).

and to dismiss critical, conceptual, or philosophical questions that interrogate history itself.[36] What used to be called "outreach" is now called "public history."[37]

Finally, at the end of the twentieth century, the rise of digital media and a "crisis" of university presses fostered fears of the decline of monograph publishing.[38] A number of initiatives to experiment with alternative long-form digital narratives emerged, especially in the digital humanities. An early example in history is the excellent and innovative Valley of the Shadow project, which is still cited as an exemplary example (as it should be).[39] Yet the paucity of nonlinear narratives that William G. Thomas III and Edward L. Ayers found in 2003 still feels true today.[40] The "revolution" seems to be in the old sense, to revolve. Books are still published in codex format; textual narratives dominate, even for born-digital projects; visualizations are appendages (usually pictures or 2D graphs) rather than explorations of visual-verbal narratives. The innovation today is the PDF (or EPUB) of a textual document. History remains a book-publishing profession.[41]

[36] As an example, the cultural and linguistic turn is blamed for the demise of cliometrics. See Blevins, "Digital History's Perpetual Future Tense," 310.

[37] Winters has noted that this emphasis on a public presence of digital history is particularly strong in the US ("Digital History," 280–81). While greater dissemination of history is important, the category of public history only makes sense against its opposite: history—that is, the realm of the academic profession. Modern history has been public in the sense that it applies to people within the conscribed unit—the nation-state.

[38] For a wonderful study of the staying power of books as "bookishness" by a digital humanist, see Jessica Pressman, *Bookishness: Loving Books in a Digital Age* (New York: Columbia University Press, 2020).

[39] The Valley of the Shadow: Two Communities in the American Civil War (website), University of Virginia Library, accessed 23 August 2022, https://valley.lib.virginia.edu/. See also William G. Thomas III and Edward L. Ayers, "An Overview: The Differences Slavery Made: A Close Analysis of Two American Communities," *American Historical Review* 108, no. 5 (2003), 1299–1307.

[40] Thomas and Ayers, "An Overview," 1303.

[41] See the fine forum "History as a Book Discipline," *Perspectives on History*, 1 April 2015, https://www.historians.org/publications-and-directories/perspectives-on-history/april-2015/history-as-a-book-discipline-an-introduction. The participants make informed arguments for a more varied approach to publishing. My sense, though, is that "habits of thinking" have made change exceedingly difficult. It is also questionable whether this "revolution" has led to greater access. It has for those with institutional subscriptions, but the shift from print to PDF has quite possibly made things more gated. Open access publishing (in the US) has made some inroads, but traditional presses have incorporated open access into their profit models, and habits of thinking continue to steer scholars toward gated publishers.

In short, beginning with Bush rather than with Busa makes it more possible for us to imagine a history of computers and history as a communicative system that places humans as actors. For digital history to fulfill its promise, beyond Digital History 1.0, it is important to move beyond application and to interrogate both the digital and history. Digital media opens the conversation to purpose.

BACK TO BASICS: HISTORIES 0.1

One way forward for digital history is to go "backward"—that is, to the basic elements that give rise to the various practices that make up history. Here, we return to Eisenstein, who broke down the steps to storage, retrieval, duplication, and transmission. Alan Liu, starting from digital media and moving to the past, has reduced key actions to store and forward.[42] In these steps, choices are made regarding what is worth preserving and transmitting, and for whom. In this sense, history has been more than a knowledge system of the past; it is an important medium to communicate previous knowledge and experience. In nonmodern societies, those histories were usually stories of wisdom and great deeds. Koselleck characterized these stories as *historia magistra vitae* in Europe.[43] Modern history dismissed many of these stories as myth and unreliable and turned to documents and "facts," thereby shifting the subject from exemplary deeds to the becoming of political-economic units. In the digital age, history again faces a wide range of prior happenings; it is an opportunity for historians to consider pasts that modern history had elided or dismissed to other disciplines.

This periodization of history writing parallels the overview of communicative systems by two scholars of digital media, the folklorist John Miles Foley and the digital humanist Alan Liu. Foley has organized communication into places of exchange, or agoras; there are oral, textual, and digital agoras.[44] Liu has divided communication into three systems according to voice: the Age of Ancestors, Age of Authors, and Age of Friends.[45] Both have identified more similarities in

[42] Alan Liu, *Friending the Past: The Sense of History in the Digital Age* (Chicago: University of Chicago Press, 2018), 13.

[43] Reinhart Koselleck, "Historia Magistra Vitae: The Dissolution of the Topos into the Perspective of a Modernized Historical Process," in *Futures Past*, 21–38.

[44] John Miles Foley, *Oral Tradition and the Internet: Pathways of the Mind* (Urbana: University of Illinois Press, 2012).

[45] Liu, *Friending the Past.*

the oral and digital modes; the textual mode, our practice, is the outlier. In the oral agora (Age of Ancestors) and the digital agora (Age of Friends), mode of exchange is characterized by synchronous, public, shared, remixed, and iterative transmission. In the Age of Authors, fixed texts, asynchronous and disembodied transmission, and proprietorship (copyright) frame exchange. Neither scholar conflated oral and digital modes, and both recognized that the textual is often transported to the digital. The movable-type press facilitated the filtering of records of previous happenings both to and outside of the past; today, digital media, though not the cause, is expanding "the past" to "pasts." It is important to remember that "the past" (as a timeform that marks a period that is prior and different) came into being during the eighteenth century and is integral to the application of absolute time to modern history.[46]

Historians are increasingly attentive to this expansion of pasts and its impact on historical thinking. François Hartog has set off considerable debate with his worry that modern society's horizon has been reduced to a presentism; Aleida Assmann has explored why modern time is "out of joint"; and Zoltán Boldizsár Simon has provocatively suggested that we are in "unprecedented times."[47] Other historians are exploring the presentness and performativity of pasts.[48]

This expansion of pasts is challenging history. The multiplicity of pasts has always been with us, but it has been circumscribed within a hierarchy of becoming, "entombed," or relegated to related disciplines or practices.[49] Digital media accelerates the retrieval and duplication of

[46] Zachary Sayre Schiffman, *The Birth of the Past* (Baltimore: Johns Hopkins University Press, 2011).

[47] François Hartog, *Regimes of Historicity: Presentism and Experiences of Time*, transl. Saskia Brown (New York: Columbia University Press, 2015); Aleida Assmann, *Is Time Out of Joint? On the Rise and Fall of the Modern Time Regime*, transl. Sarah Clift (Ithaca, NY: Cornell University Press, 2020); and Zoltán Boldizsár Simon, *History in Times of Unprecedented Change: A Theory for the 21st Century* (London: Bloomsbury Academic, 2020).

[48] For recent work in history that recognizes that pasts are not limited to the past, see, for example, Anna Clark, Stefan Berger, Marnie Hughes-Warrington, and Stuart Macintyre, "What Is History? Historiography Roundtable," *Rethinking History* 22, no. 4 (2018), 500–24; Chris Lorenz, "Unstuck in Time, or: The Sudden Presence of the Past," in Tilmans, van Vree, and Winter, *Performing the Past*, 67–102; Aleida Assmann, "Re-framing Memory: Between Individual and Collective Forms of Constructing the Past," in Tilmans, van Vree, and Winter, *Performing the Past*, 35–50; and Herman Paul, *Key Issues in Historical Theory* (New York: Routledge, 2015). For an important meditation on the past in the digital age, see Liu, *Friending the Past*.

[49] See Michel de Certeau, *The Writing of History*, transl. Tom Conley (New York: Columbia University Press, 1988), 1–16.

previous happenings and enables the creation and transmission of alternatives. Various pasts are appearing at most levels of society and across political spectrums: as symbols, to rewrite national histories by various people ranging from state leaders to fringe groups; as evidence, to support identities; in the revitalization of discriminatory stereotypes and practices in Big Data; in scholarly debates on presentism; and in work on memory, monuments, and memorialization. This is one outcome of the idealistic goal of digital media—widespread access to and use of pasts. Yet, the heterogeneity of pasts is decreasingly containable by homogenizing techniques of modern history.

In my above description of the two possible narratives, I also included elements of a third possibility: history organized around multiple times. If I follow my earlier pattern of some origin, for histories using multiple chronologies, we can turn to the sixteenth and seventeenth centuries.[50] If we stay within the modern period, we can look to the sciences. As modern history was being institutionalized around chronological time (today called "classical time" in the sciences) in the nineteenth and twentieth centuries, other times were being "discovered" in the sciences (for example, thermodynamics, relativity, biochronology, and quantum theory), and temporalities beyond linearity (recursivity, circular causality, and homeostasis) are now common. These multiple times, the presence of multiple pasts, and the possibility that pasts are active in the present unsettle historians' doctrine that change occurs over time. This is a truism as long as we believe that time is absolute.[51]

Change is complex; it is only linear in simple (causal) mechanical processes and retrospectives. Koselleck's "structures of repetition" suggest a way to conceptualize activity in multiple times. Koselleck described these structures as "constantly possible, variably realizable but only situationally determined recurrent conditions of individual events and their consequences."[52] Change emerges from recurrent processes, "self-repeating preconditions," depending on

[50] Helge Jordheim, "Return to Chronology," in *Rethinking Historical Time: New Approaches to Presentism*, ed. Marek Tamm and Laurent Olivier (London: Bloomsbury Academic, 2019), 43–56.

[51] There is much research on the history of modern time. For overviews, see, for example, my *History without Chronology* (Amherst: Lever Press, 2019); Assmann, *Is Time Out of Joint?*; and Helga Nowotny, *Time: The Modern and Postmodern Experience*, transl. Neville Plaice (Malden, MA: Polity Press, 1994).

[52] Koselleck, "Repetitive Structures in Language and History," 54.

individuals, environment, and external input. Each interaction involves a conscious or situational exchange of information. Koselleck listed different repetitive structures: nonanthropogenic conditions, biological premises, repetitive structures of humans, diachronic prerequisites, and repetitive linguistic structures. The times of these repetitive structures are multiple and layered, autonomous and coexisting among individuals, society, and the environment. Following interaction, some event or consequence might result. These preconditions are from before, but they are not necessarily of "the past." The previous examples from Kaempffert, Kling, and digital history itself have demonstrated that we have been living and experiencing a complex transition. In Kaempffert's image of the housewife, there are multiple times--the unilinearity of progress, gendered time of the household, and self-repeating structures; in Kling's work, individual, institutional, and social times show layered times competing and adjusting to one another; self-repeating preconditions are evident today in scholars' and academic institutions' varied responses to the potential and perceived threat of digital media; and in this article, there is possibility that a next might come from before.

This discussion of multiple times opens history to pasts that modern history has forsaken, and if there is similarity between the oral and the digital, digital media facilitates a reconsideration of practices that are common in oral modes of transmitting pasts. For example, self-repeating preconditions expand a sense of history not only from a knowledge of before but also as a guide for present action. In a sense, this might be an updated *historia magistra vitae* wherein historical understandings, preconditions, operate in the present. But the significance of such preconditions to learning is not "old"; it is consistent with studies in psychology (situated learning) and cognitive science (distributed cognition).[53] There is much potential for how we think about the functioning of histories in society. History is less a description of the past and more a set of communicative processes wherein pasts are active agents that are integral to learning and knowing.[54]

[53] Michael Cole, "The Zone of Proximal Development: Where Culture and Cognition Create Each Other," in *Culture, Communication, and Cognition: Vygotskian Perspectives*, ed. James V. Wertsch (Cambridge: Cambridge University Press, 1985), 146–161; Edwin Hutchins, *Cognition in the Wild* (Cambridge, MA: MIT Press, 1995).

[54] A wonderful example that explores the interrelations of memory, material culture, narrative templates, and events for historical understanding is James V. Wertsch, *How Nations Remember: A Narrative Approach* (Oxford: Oxford University Press, 2021).

At this point, I would like to return to computing and history, but I would like to do so by inverting their interaction from that of Origin I. On the surface, artificial intelligence and history have become diametrically opposed. For example, in their textbook on AI, Stuart J. Russell and Peter Norvig stated that AI is "relevant to any intellectual task; it is truly a universal field."[55] AI has become a universalism that history once claimed. This is the same faith in science and technology that Kaempffert and Bush exhibited, but it has now been extended to the "mechanization of the mind."[56] However, in his recently published book, *Human Compatible: AI and the Problem of Control*, Russell, one of the founding figures of AI, expressed concern that, if it is successful (and, he argued, it very likely will be), AI might become "an existential threat to our species."[57] Russell proposed the creation of "beneficial machines," machines that maximize the realization of human preferences; understanding those preferences, he continued, requires attention to assumptions, learning, and habits—that is, different pasts.[58] These encompass Koselleck's self-repeating preconditions. Russell's attention to preferences strikes me as those various pasts that, according to Hayden White, inform our present.[59] At least on the surface, Koselleck and Russell have called for ethical and variable understandings that are embedded in the experience and knowledge that help guide individuals (and that are now being extended to AI).[60] Historians have long dealt with human variability and differences; a major problem has been the homogenizing structure. In this case, digital history, or history in the digital age, might *also* add an "old" practice to help the "new."

Finally, this recognition of pasts can release the potential, the affordances, of digital media and other modes of transmission to reach multiple audiences. Following the three Ages or agoras,

[55] Stuart J. Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, 3rd ed. (Upper Saddle River: Prentice Hall, 2010), 1, quoted in Crawford, *Atlas of AI*, 11.

[56] This is the title of Jean-Pierre Dupuy's study of cybernetics and the rise of cognitive science: *The Mechanization of the Mind: On the Origins of Cognitive Science*, transl. M. B. DeBevoise (Princeton: Princeton University Press, 2000).

[57] Stuart Russell, *Human Compatible: Artificial Intelligence and the Problem of Control* (London: Allen Lane, 2019), 113.

[58] Ibid., 11–12, 172–79.

[59] Hayden White, "The Practical Past," in *The Practical Past* (Evanston, IL: Northwestern University Press, 2014), 3–24.

[60] There is an important methodological difference. Russell proposed machine learning to understand human preferences. See Russell, *Human Compatible*, 177–79.

history in the digital age need not be restricted, unless by choice rather than by habit, to the textual mode. Digital history has helped historians reach a larger public through "public history." But it is more an extension of history to a broader audience via the internet and related institutions (such as history societies, museums, and archives) than it is an opening toward different media (such as visual-verbal narratives and film) and modes of writing history (such as comics and storytelling).[61] Multimodality and multiple narratives help us approach White's argument for pasts that connect to individual and local community experience. White argued for "a past which I (or the community with which I identify) believe to be most relevant to my inquiries. It is this past, rather than the historical one, that requires a narrative which, in one way or another, connects my present and that of my community to an existential present in which judgment and decision about the question, 'What should I do?' are called for."[62] A recent survey sponsored by the American Historical Association and Fairleigh Dickinson University (with funding from the National Endowment for the Humanities) identified this connection (actually, this lack of connection) between academic history and experience as one reason why the US public does not turn to academic history for information about the past.[63] The survey demonstrates the US public's high interest in and value of history. This contrasts to a dim view of school (including university) history. The difference is an interest in explanation, connection, and experience versus history as names, dates, and events. The respondents reported that they are more likely to turn to media (film, video, news, newspaper, and Wikipedia) than to history courses. (Historical monographs were not included or mentioned.)

An affordance of digital media is its multimodality; digital media offers heterogeneous media that enable readers to have different types of engagement with histories. I will end this discussion by turning to a project by a scholar who was central to the early development of digital history,

[61] In the digital age, the separation between history and public history makes little sense and, worse, steers historians away from nontextual, multimodal narratives. I have taught a class called History through Comics for several years. These visual-verbal narratives use storytelling and incorporate multiple perspectives and voices; through the "gutter," they invite readers to participate, filling in the gaps. I am confident that students in this class learned history (usually postwar Japanese history) as much as or more than students in my lecture classes.

[62] Hayden White, "Historical Discourse and Literary Theory," in *The Practical Past*, 76.

[63] Peter Burkholder and Dana Schaffer, *History, the Past, and Public Culture: Results from a National Survey* (Washington, DC: American Historical Association, 2021), https://www.historians.org/history-culture-survey.

William G. Thomas III, who is well-known as codirector (with Edward L. Ayers) of the Valley of the Shadow project. Lesser known is Thomas's recent project, in which he writes history in three media—animated films, a website, and a print book. The animated short film *Anna* (2018) and the animated feature-length film *The Bell Affair* (2022), which Thomas wrote and produced with directors Michael Burton and Kwakiutl L. Dreher, are storytelling using a visual-verbal format.[64] It retrieves what Walter Benjamin lamented history removes: "It is as if something that seemed inalienable to us, the securest among our possessions, were taken from us: the ability to exchange experiences."[65] The original documents are available in a web archive, O Say Can You See: Early Washington, D.C., Law and Family.[66] While the website enables interested users to engage in historical research themselves, it also connects to various models for writing, *Anna*, *The Bell Affair*, and his recent book, *A Question of Freedom: The Families Who Challenged Slavery from the Nation's Founding to the Civil War*.[67] Importantly, digital media does not replace; it opens up multiple and heterogeneous levels of engagement.

In conclusion, I am arguing for a new. But it is a new wherein the antecedent is not the prior "old" but a different framework of inscription technologies and communication that has operated since the emergence of writing. Digital media, too, is changing how people engage with the past; indeed, we are learning that the past is not past. This is an opportunity for history to explore the disruptions and affordances of digital media in order to find more ways for people to engage with pasts. By doing so, I hope history expands by recovering some of the roles and significance that were lost in the rise of modern history.

[64] *Anna*, written by William G. Thomas III and Kwakiutl L. Dreher, directed by Michael Burton and Kwakiutl L. Dreher, produced by Michael Burton, Kwakiutl L. Dreher, and William G. Thomas III (2018); *The Bell Affair,* written by William G. Thomas III and Kwakiutl L. Dreher, directed by Kwakiutl L. Dreher and William G. Thomas III, produced by Michael Burton, Kwakiutl L. Dreher, and William G. Thomas III (2022). It is still too early to gauge reception, but *Anna* has been out for several years and I have not run across mention of it or the format as a mode of digital history. For more information about these films, visit their respective websites: http://annwilliamsfilm.com/ and https://animatinghistory.com/bellaffair/.

[65] Walter Benjamin, "The Storyteller," in *Illuminations*, ed. Hannah Arendt, transl. Harry Zohn (New York: Schocken Books, 1968), 83.

[66] William G. Thomas III et al., O Say Can You See: Early Washington, D.C., Law and Family (website), University of Nebraska–Lincoln, accessed 23 August 2022, https://earlywashingtondc.org/. This website fits a common genre that makes documents available on the internet.

[67] William G. Thomas III, *A Question of Freedom: The Families Who Challenged Slavery from the Nation's Founding to the Civil War* (New Haven: Yale University Press, 2020).