

TABLE RONDE / ROUND TABLE

Blazing Trails Toward Digital History Scholarship

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HISTORIANS HAVE experimented with computing technology for decades, using it as a tool in their scholarship to ask new questions and analyse new sources. For the most part, historians have used statistical software and adopted techniques from the social sciences. They have analysed voting returns, migration, social mobility, family patterns, and a wide array of structures in economy, society, and politics. They borrowed freely from the social sciences, adopting theories, jargon, and subfields. The reaction to their work and the use of computing technology in it was mixed, as conservative historians defended the “humanistic” approach and railed against “quanto-history” and “psycho-history”. Critics of quantitative approaches to history watched carefully for technological determinism and emphasized the roles of individuals and the limitations of structural patterns to explain adequately events, human change, and social life. But quantitative historians have achieved notable breakthrough interpretations in social, economic, and political history over the last 30 years. Throughout these years quantitative historians defended their scientific approach to historical problems, yet did not use the computer to create new forms of scholarly presentation. In the 1970s and 1980s historians, even those experimenting in narrative forms with post-structuralism, used computers only to analyse and measure patterns in data, not to create or present new forms of scholarship and narrative.¹

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¹ The literature on history and computing is large. For some of the critical works on statistical and quantitative approaches to history and the use of computing applications in historical scholarship, see Peter Denley and Deian Hopkin, eds., *History and Computing* (Manchester: Manchester University Press, 1987); Peter Denley, Stefan Fogelvik, and Charles Harvey, eds., *History and Computing II* (Manchester: Manchester University Press, 1989); Loren Haskins and Kirk Jeffrey, *Understanding Quantitative History* (Cambridge: MIT Press, 1990). For the major essays on computing in historical

In the 1990s, however, humanities scholars in general and some historians in particular began using technology to develop new narrative forms on the World Wide Web. The explosion of the Internet and the World Wide Web in the nineties offered scholars more than techniques for data collection and analysis; it presented new technologies to enable and create aesthetically appealing, multifaceted works that emphasized complexity, extensibility, and multiple viewpoints. Both the scholarly object itself — the book and the journal article — and our views of it also shifted with changes in the ways technology has been applied to the humanities. After nearly a decade of experimentation on the World Wide Web, we are at a moment in the discipline of history when significant change is underway in our practices and in the forms of our scholarship, and it might be useful to pause and examine what the technology might allow historians to do better in their scholarship or to do what we have always wanted to do but have not been able. We should consider, then, not only what tools the technology might bring to historical inquiry, but what forms of presentation these technologies might allow historians in their scholarship.

In the professions, for example, architects are reshaping their work, creating entirely new approaches to structures by experimenting with computer technologies. Architects designing almost exclusively with CAD (Computer Aided Design) are using computers to design new structures, never before entertained. These designs have recently been exhibited at the Carnegie Museum of Art in Pittsburgh in “Folds, Blobs + Boxes: Architecture in the Digital Era”. Frank Lloyd Wright, nearly 100 years ago in a speech at Hull House in Chicago, considered modern technology the catalyst for a new kind of architecture and viewed technology in architecture as almost an end in itself. Following Wright, digital architects are creating a whole new vocabulary to describe their work, considering terms such as space, perspective, scale, and proportion antiquarian and instead preferring such terms as smooth, supple, and morphed. They envision designing buildings purely for virtual worlds, but their theories are beginning to find their way into real

scholarship, see J. Barzun, “History: The Muse and Her Doctors”, *American Historical Review*, vol. 77 (1972), pp. 36–64; Allan G. Bogue, “Great Expectations and Secular Depreciation: The First 10 Years of the Social Science History Association”, *Social Science History*, vol. 11 (1987); J. M. Clubb, “The ‘New’ Quantitative History: Social Science or Old Wine in New Bottles?” in J. M. Clubb and E. K. Scheuch, eds., *Historical Social Research: The Use of Historical and Process-Produced Data* (Stuttgart: Klett-Cotta, 1980), pp. 19–24; J. M. Clubb and H. Allen, “Computers and Historical Studies”, *Journal of American History*, vol. 54 (1967), pp. 599–607; Charlotte Erikson, “Quantitative History”, *American Historical Review*, vol. 80 (1975), pp. 351–365; N. Fitch, “Statistical Fantasies and Historical Facts: History in Crisis and its Methodological Implications”, *Historical Methods*, vol. 17 (1984), pp. 239–254; Gertrude Himmelfarb, *The New History and the Old* (Cambridge: Harvard University Press, 1987); Robert P. Swierenga, “Computers and American History: The Impact of the ‘New’ Generation”, *The Journal of American History*, vol. 60, no. 4 (March 1974), pp. 1045–1070; Roger Middleton and Peter Wardley, “Information Technology in Economic and Social History: The Computer as Philosopher’s Stone or Pandora’s Box?”, *Economic History Review*, new series, vol. 43, no. 4. (November 1990), pp. 667–696.

buildings as well. Greg Lynn's Embryologic Houses, for example, are variations on a blob, computer-produced, without windows. Architects are blazing new trails with computer designs, producing critical work with shapes that change and resisting static two-dimensional drawings.²

Across the humanities scholars using digital technology in their work have experimented with new vocabulary and created new aesthetics for scholarly production. Forms impossible to envision before the aid of a computer have developed in literature, art, and criticism. Historians have followed the work in other disciplines as they have tried to analyse the shape of the new media and how digital computing technology affects the structure, presentation, and nature of narrative. Literary criticism, especially postmodern criticism, has focused on recent developments in experimental uses of technology in literature. This literature stresses the "ergodic" nature of cybertext, the lack of endings in hypertext narrative, the blurred line between reader and author, and the importance of hyperlinking.³

In many respects this literature offers historians few points of convergence as they experiment with narrative. Historians have widely considered their craft a narrative of explanation, an exploration of causes of events and a telling of them. Arguments within the historical profession over narrative and theory have turned on the role of empiricism and the linguistic turn in historical inquiry, on the roles of structuralism and post-structural theory, and on whether professional orthodoxy has privileged explanation over description in historiography. Some historians have tried to distinguish "fixed" from "open" narrative, calling explicitly for a more fluid engagement with the reader, but rejecting post-structural theory. Others have emphasized post-structuralism as a guiding approach for historians in constructing their narra-

2 Carnegie Museum of Art, "Folds, Blobs + Boxes: Architecture in the Digital Era", February 3 to May 21, 2001 [online web site], <http://www.cmoa.org/html/exhibit/archives01.htm#folds>. For reviews of the exhibit, see Helen Vendler, *The New Yorker*, March 12, 2001; Benjamin Forgey, "Pitch Out the T Square: Computer Design Tools Have Taken Architecture From Plane to Fancy", *The Washington Post*, March 3, 2001.

3 Selected literature on hypertext theory includes the following. On ergodic literature, see Espen Aarseth, "Nonlinearity and Literary Theory" in G. P. Landow, ed., *Hypertext and Literary Theory* (Baltimore: Johns Hopkins University Press, 1993) and *Cybertext: Perspectives on Ergodic Literature* (Baltimore: Johns Hopkins University Press, 1997). On the lack of endings in hypertext, see Michael Joyce, *Of Two Minds: Hypertext Pedagogy and Poetics* (Lansing: University of Michigan Press, 1994). On the blurred lines between reader and author and the importance of hyperlinking, see George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins University Press, 1992) and *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology*, 2nd ed. (Baltimore: Johns Hopkins University Press, 1997); Stuart Moulthrop, "Beyond the Electronic Book: A Critique of Hypertext Rhetoric" in P. D. Stotts and R. K. Furuta, eds., *Hypertext '91 Proceedings* (San Antonio: Association for Computing Machinery, 1991), pp. 291–299, and "You Say You Want a Revolution? Hypertext and the Laws of Media" in E. Amiran and J. Unsworth, eds., *Essays in Postmodern Culture* (New York: Oxford University Press, 1993); Stuart Moulthrop, ed., Special Hypertext Issue, *Writing on the Edge*, vol. 2, no. 2 (1991); Ben Shneiderman, *Designing the User Interface-Strategies for the Effective Human-Computer Interaction*, 2nd ed. (Reading, Mass.: Addison Wesley, 1992).

tives. Still others have pointed to imagination as the theoretical lynchpin in the debates over historical narrative, whether modernist, structural, or post-structural. And a few historians have tried to navigate a middle road, taking seriously the “postmodern” view and taking equally seriously the objectivist position.⁴

What can we expect historical scholarship to look like in the electronic medium and what forms of historical narrative might be enhanced or enabled? Robert Darnton, long a pioneer in opening historical scholarship to new topics and approaches, wrote an essay in 1999 that contained a brief but tantalizing vision of an electronic work of history. Most of his article, composed while he was president of the American Historical Association, described the pressures pushing toward electronic scholarship, especially the crisis of the monograph. In a few paragraphs he sketched a new kind of scholarly book as a pyramid of layers: a concise narrative at the top, followed by ever-wider components — an expanded narrative, documentation, historiography, pedagogy, and professional commentary. “I am not advocating the sheer accumulation of data, or arguing for links to databanks — so-called hyperlinks,” Darnton cautioned in his 1999 *New York Review of Books* essay on the future of the book. “These can amount to little more than an elaborate form of footnoting.” Darnton hoped that “A new book of this kind would elicit a new kind of reading.” The article received a great deal of attention, and Darnton collaborated on a prototype for the *American Historical Review*, published in February 2000, to show what such an entity might look like. The

4 For an overview of the historical profession’s development and its emphasis on explanation and objectivism, see Peter Novick, *That Noble Dream: The “Objectivity Question” and the American Historical Profession* (Cambridge: Harvard University Press, 1988). For an excellent dialogue on “scientific history”, see Robert William Fogel and G. R. Elton, *Which Road to the Past: Two Views of History* (New Haven: Yale University Press, 1983). See also the extensive debate over quantitative history stemming from Fogel and Engerman’s *Time on the Cross: Paul David et. al., Reckoning with Slavery: A Critical Study in the Quantitative History of American Negro Slavery* (New York: Oxford University Press, 1976); Robert William Fogel and Stanley Engerman, *Time on the Cross: The Economics of American Negro Slavery* (London: Little Brown, 1974), vol. 1 and vol. 2, *Evidence and Methods*; Herbert Gutman, *Slavery and the Numbers Game: A Critique of “Time on the Cross”* (Urbana: University of Illinois Press, 1975). For an overview of the state of social science history, see J. Morgan Kousser, “The State of Social Science History in the Late 1980s”, *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, vol. 22 (1989), pp. 12–20. For an excellent analysis of the problem of historical narrative, see Allan Megill, “Recounting the Past: ‘Description’, Explanation, and Narrative in Historiography”, *American Historical Review*, vol. 94 (June 1989), pp. 627–653. For an example of “open narrative”, see Edward L. Ayers, “Narrating the New South”, *Journal of Southern History*, vol. 61 (August 1995), pp. 555–566. On post-structural narrative in history and the place of quantitative historical approaches within post-structuralism, see Hans Kellner, “Narrativity in History: Post-Structuralism and Since”, *History and Theory*, vol. 26, no. 4, Beiheft 26: The Representation of Historical Events (December 1987), pp. 1–29; and on historical narrative as imagination and on the postmodern view generally, see Hayden White, “The Question of Narrative in Contemporary Historical Theory”, *History and Theory*, vol. 23, no. 1 (February 1984), pp. 1–33. For historians seeking middle ground, see, for example, Thomas Haskell, ed., *The Authority of Experts: Studies in History and Theory* (Bloomington: University of Indiana Press, 1984).

American Historical Association is underwriting the creation of a series of electronic monographs in a refreshing display of leadership and innovation.⁵

We have been creating our own version of such scholarship since the early 1990s with the “Valley of the Shadow Project” at the Virginia Center for Digital History. More recently, Edward L. Ayers and I are producing a scholarly article for the *American Historical Review* in fully electronic form, taking advantage of the latest technologies. We have two goals for the article, titled “Two American Communities on the Eve of Civil War: An Experiment in Form and Analysis”. For our first goal, the article analyses the complex differences and similarities in 1860–1861 between a Northern and Southern community. Drawing on the large digital archive of the “Valley of the Shadow Project”, the article explores in great detail and multiple dimensions a Northern and Southern community during the events leading up to Lincoln’s election and the secession of Southern states. It uses computing technologies to deepen and extend our analysis and to make connections that would not otherwise be possible. The authors test the similarity and differences in the social logic of these communities, whether the differences were discernible in geography of land use, agricultural practices, and built infrastructure as well as in political leadership and voting. Secondly, the article is intended to experiment with the medium of electronic scholarship and to offer one example of this form. The article deploys an array of technologies, especially Geographic Information Systems and statistical analysis in the creation of the evidence. Most importantly and innovatively, the article is built in Extensible Markup Language (XML). The article tries to marry analysis with the new format of electronic presentation and connection, taking advantage of the medium to enhance the analysis.⁶

The electronic article tries to structure the scholarly form of a historical journal article in such a way that it provides strikingly enhanced accessibility, readability, and connectivity without compromising the professional craft of historical narrative. The article is a single file of nearly 18,000 lines of text marked up in XML, not dozens of individual web pages with embedded links to each other. A style sheet (XSL) governs the presentation and

5 Robert Darnton, “The New Age of the Book”, *New York Review of Books*, March 18, 1999. See also “The Bookless Future: An Online Exchange between Robert Darnton and Keiji Kato”, *The Book and the Computer: The Future of the Printed Word* [online publication], <http://www.honco.net/100day/03/2001-0607-dk1.html>. For an example of the AHA’s effort to produce electronic articles, see the History Cooperative site, <http://www.historycooperative.org>. For Darnton’s electronic article, see the February 2000 issue of the *American Historical Review*.

6 Edward L. Ayers and William G. Thomas, III, “Two American Communities on the Eve of Civil War: An Experiment in Form and Analysis”, forthcoming as an electronic article in the *American Historical Review*. For a draft version of this article, see <http://www.vcdh.virginia.edu/AHR/article.html>. For a review of the Valley project web site, see Gary J. Kornblith, “Venturing into the Civil War, Virtually: A Review”, *Journal of American History*, vol. 88 (June 2001), pp. 145–151. See also William G. Thomas, III, “In the Valley of the Shadow: Communities and History in the American Civil War”, *Virginia Magazine of History and Biography* (August 1998), pp. 301–318.

arrangement of the document on the web. The article, then, like a traditional article, is a single structured document and comprises *in toto* our narrative. We consider our work an experiment in form because we have created a structure that emphasizes the fluidity of our narrative and the complementary relationship between author and reader in the electronic medium. The effort was created in part to fulfil a longing eloquently described by Darnton:

Any historian who has done long stints of research knows the frustration over his or her inability to communicate the fathomlessness of the archives and the bottomlessness of the past. If only my reader could have a look inside this box, you say to yourself, at all the letters in it, not just the lines from the letter I am quoting. If only I could follow that trail in my text just as I pursued it through the dossiers, when I felt free to take detours leading away from my main subject. If only I could show how themes crisscross outside my narrative and extend far beyond the boundaries of my book.⁷

While Darnton points to a real danger of the new medium — mindless, limitless gathering and presentation of data — hyperlinking remains one of electronic publication's key attributes and advantages. Indeed, the interactions among the various aspects of narrative and documentation seem to be the most exciting aspect of digital scholarship. As historians, we are most interested in hypertext as a new form of annotation, at which it naturally excels. We see ourselves as part of a continuum of scholarship, picking up some traditions from centuries ago, such as glosses, commentary, and footnotes; some neglected experiments of recent decades, such as social science history and narrative innovation; and some emergent technologies, such as an open and extensible mark-up language that permits a more powerful and flexible kind of linking than we had in 1999 — or in 2000, for that matter. Ideally, historians will combine these tools to create a professional scholarship that is richer, more rigorous, and more useful than current practice permits.

Anthony Grafton has written a fascinating history of annotation that shows how central that practice is to all historical scholarship. He demonstrates that

in the course of the later seventeenth and eighteenth centuries, ... a long series of debates and discussions among writers, translators, and printers gradually yielded something like the modern system of documentation — even if the process did not then reach, and still has not reached, completion. Across Europe, writers and publishers collaborated more intensively than ever before, trying to make every aspect of the physical presentation of text mirror and guide the reader through its content. A revolution in book design took place, as those concerned with authorship and publication carried out experiments in

⁷ Darnton, "The New Age of the Book".

layout and design, trying to make books physically as well as intellectually accessible.

That is much like what is happening now, when powerful currents of innovation are coursing through the worlds of computers, publishing, and libraries. Scholars are just beginning to grasp the opportunities presented by that ferment, just as they did several hundred years ago when they created the forms that still characterize professional history.⁸

While Grafton apparently did not write with electronic scholarship in mind, the following passage sounds like nothing so much as hypertext. “Wise historians know that their craft resembles Penelope’s art of weaving: footnotes and text will come together again and again, in ever-changing combinations of patterns and colors. Stability is not to be reached. Nonetheless, the culturally contingent and eminently fallible footnote offers the only guarantee we have that statements about the past derive from identifiable sources. ...Only the use of footnotes enables historians to make their texts not monologues but conversations, in which modern scholars, their predecessors, and their subjects all take part.”⁹

Robert Townsend, in a recent article in the *AHA Perspectives*, described the tentative efforts to develop an electronic scholarly article. “There are very few cases where the technology has been used to transcend the traditional forms of the journal article,” he noted. “Most online publications involve only a few small audiovisual enhancements or hotlinks, where availability seems to be the criteria for inclusion rather than substantive contribution to the argument or the scholarship.” Townsend, editor of *AHA Perspectives*, went on to suggest that creating a new form for scholarship tailored to the digital medium would require “an enormous amount of thought and effort beyond the basic work of research and writing”. Such scholarship would need, he argued, to be built expressly for the digital medium from the ground up.¹⁰

The timing is ripe for historians to work in the digital medium. New technologies, especially the development of Extensible Markup Language (XML), have made possible new forms of digital historical scholarship. Hypertext Markup Language (HTML) offers the greatest ease of development for many web producers, since the coding is simple and straightforward, widely used, and fully supported by the average browser technology. HTML’s widespread adoption on the web means that it has successfully become a *de facto* standard for web publishing, but HTML has limitations. It does little to structure the text and its loose rules allow for a wide range of divergence in coding. HTML data

8 Anthony Grafton, *The Footnote: A Curious History* (Cambridge: Harvard University Press, 1997), pp. 220–223.

9 *Ibid.*, pp. 233–234.

10 Robert Townsend, “Lessons Learned: Five Years in Cyberspace”, *AHA Perspectives*, vol. 39 (2001), pp. 3–5.

are generally static, unable to be effectively searched or accessed other than in the ways the author predetermined. XML, though, has a more rigorous set of rules than HTML and requires that all documents meet these rules. In general, XML describes the structure of a text rather than its presentation, allowing authors to separate the two. Presentation is governed by style sheets or Extensible Stylesheet Language (XSL). The text then becomes platform-independent and fully structured, making it searchable, portable, and extensible.

The power of XML for historians lies in its extensibility and modularity. Evidence, analysis, commentary, and historiography modules might be added to scholarly electronic articles, extending them with new evidence, counter arguments, and alternative readings. We might imagine, for example, another article written from a different point of view extended from the same data set, so that a reader could sort the data used by an author for comparison with the opposing writer. Evidence, analysis, and historiography modules could all be extended either by the authors or other writers. The modular approach in XML does not elevate argument over evidence, historiography, or method, allowing each to stand on its own and yet still in relation to one another. Most importantly, XML might allow for “forward and backward linkages” from evidence to historiography to analysis and vice versa. This powerful style sheet capability might allow authors to show readers the various places in the analysis where they invoke a particular piece of evidence or historiography.

In many subject areas of history, the most innovative sites are those produced by digital libraries, many of them using technologies such as XML and SGML to arrange their collections. University libraries at Duke, North Carolina, Virginia, Michigan, Berkeley, and Cornell, as well as the Library of Congress, and the National Archives have built large digital repositories, opening access to manuscripts, maps, images, and other data. Libraries have been at the forefront of the Text Encoding Initiative, the Encoded Archival Description, and other efforts to develop standards for data markup. Libraries, too, have used these standards in the creation of their own digital collections. The result for historians is a vast collection of standardized material which in the future might be interconnected.¹¹

Libraries, with good reason, promote the work of archivists and manage collections found only in their holdings, but historians have other goals and different needs. Some historians have constructed “intentional archives”. A scholar or a team of scholars guide the form, presentation, assembly, and editing of the collection, usually to address a major problem in the historiographical literature. These large-scale efforts bear some resemblance to exhibits, as they present limited interpretive connectivity among an array of assembled materials. The visitor’s path through the exhibit is open.¹²

11 For TEI’s mission, history, and partners in the TEI Consortium, see <http://www.tei-c.org/>.

12 For examples of digital intentional archives, see the National Endowment for the Humanities EdSite-ment list at <http://edsitement.neh.gov/>. For an excellent example of a scholar-produced intentional archive, compiling a wide array of social and textual sources, see “Who Killed William Robinson”

Following the creation of “intentional archives”, the next step for historians might be to experiment with the form of their scholarship in the digital medium. It would seem likely that hypertextual histories with their emphasis on dynamic linking would be post-structural and postmodern narratives, but such a renewal of the debates over narrative and history might not necessarily be the only outcome. As a first step toward understanding the possibilities for hypertextual history, we might imagine several frameworks for historical scholarship for which the electronic medium might be especially well suited. Hypertextual history might enable:

- 1) the exploration of a comparative perspective;
- 2) the demonstration of large networks;
- 3) the instantiation of narrative forms of analysis, description, and explanation;
- 4) the connection and explication of events across time and space;
- 5) the analysis of language, syntax, texts, and cultural expression.

Digital historians have only just begun to experiment with new forms of scholarship, and some have taken limited steps in a few of these areas. For example, our electronic article, “Two American Communities on the Eve of Civil War: An Experiment in Form and Analysis”, aims at comparative analysis and, in part, at the effect of large networks, but our beginnings are tentative and many challenges lie ahead.¹³

Another experimental piece of scholarship in digital history is currently aimed at developing a systematic means to handle events in historical texts. The project is underway not at a major research library or university, but at Mount Allison University under the direction of Bruce Robertson, a professor of classics. Robertson’s “Historical Event Markup and Linking” (HEML) project has ambitious goals for historians. HEML plans to develop XML markup schemas for encoding historical events within texts. These events, once fully encoded, might be compared and searched across texts. Robert-

[online web site], <http://web.uvic.ca/history-robinson/indexmsn.html>. For an overview of historical scholarship online, see Roy Rosenzweig, “The Road to Xanadu: Public and Private Pathways on the History Web”, *Journal of American History*, vol. 88 (September 2001), pp. 548–579. See also Andrew McMichael, “The Historian, the Internet, and the Web: A Reassessment”, *AHA Perspectives*, vol. 36 (February 1998), pp. 29–32; Michael O’Malley and Roy Rosenzweig, “Brave New World or Blind Alley? American History on the World Wide Web”, *Journal of American History*, vol. 84 (June 1997), pp. 132–155.

13 For a few examples of hypertextual history scholarship, see Roy Rosenzweig, ed., “Hypertext Text Scholarship and American Studies” [online web site] <http://chnm.gmu.edu/aq>; for another example of electronic scholarship, see Robert N. Essick and Joseph Viscomi, “An Inquiry into Blake’s Method of Color Printing” [online article], <http://www.ibiblio.org/jsviscom/inquiry/basic/index.html>. See also Roy Rosenzweig, “The Riches of Hypertext for Scholarly Journals”, *Chronicle of Higher Education*, March 17, 2000. Most of these hypertext histories adopt many of the conventions of print scholarship and are produced in HTML.

son's HEML project features mapping, timelines, and graphing of historical events, all built from within the encoded document itself. XML allows such powerful applications. "Consider now the usefulness of such a mark-up scheme if it were applied to even a fraction of the thousands of historical documents and web sites published on the web," Robertson explains. "It would be possible for a curious student to ask what happened worldwide between the years 1500 and 1200 BCE and to receive a list of events linked to scholarly sources or historical arguments. Time-lines and maps could be generated from disparate sources worldwide. Such a scheme would afford humanity a new and exciting means of communicating about its past."¹⁴

Another area of potential for digital history is in language representation and analysis. The textual record of the past is only just beginning to find its way into digital format. When full historical textual records come online, historians might begin to analyse texts in new ways, ask fresh questions, and develop alternative theories. Libraries have built large digital repositories of out-of-print volumes and major works in literature. The Etext Center, for example, at the University of Virginia has compiled a full collection of Early American literature, all of it marked up in SGML for searchability and limited textual analysis. Historians have begun working in this area as well. Lloyd Benson, a historian at Furman University specializing in nineteenth-century political and social history, has developed a research project based on textual analysis of nineteenth-century newspaper editorials. His work uses TACT-Web software developed by John Bradley and Geoffrey Rockwell to examine the differences and similarities in language between Northern and Southern editors on the eve of the American Civil War. Benson's research examines such problems as the frequency of words and phrases, their proximity to other words and phrases, and the syntactical structure of their usage. Benson's project currently has marked up several hundred editorials, and so represents a small sample of the textual record of the period, but his methods and tools might be applied to a much larger set of materials, examining class, gender, and racial similarities and differences in language.¹⁵

HEML, TactWeb, and other historical projects might begin to fulfil the kind of dynamic narrative that hypertext critics have called for in cybernarrative. Janet Murray describes in her landmark book, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, four critical attributes for digital narrative: spatial, procedural, encyclopedic, and participatory. In many respects these attributes describe the historian's craft in the digital medium and might become the guiding principles for digital historical scholarship. Hypertextual history, then, might offer in its narratives spatially oriented reading and

14 Bruce Robertson, "Historical Event Markup and Linking" [online article], <http://www.heml.org>.

15 See Lloyd Benson's site at <http://www.furman.edu/~benson/docs/index.htm>. For an example of language analysis in the project, see <http://www.furman.edu/~benson/docs/edpostbl.htm>. For TACTweb, John Benson and Geoffrey Rockwell's software for textual analysis, see <http://tactweb.humanities.mcmaster.ca/tactweb/doc/tact.htm>.

arrangement of text, procedural sequencing to control data flow and step-by-step manoeuvring, accessibility to large-scale data of complex relationships, and ongoing collaboration between readers and authors. According to Edward L. Ayers, “[A] major goal of mature hypertextual history will be to embody complexity as well as to describe it.” Ayers encourages historians to see the electronic medium as an opportunity for “aesthetic intricacy”. “Hypertextual history need not introduce purposeful obfuscation and disorientation, goals often championed by some early theorists and practitioners of literary hypertext,” Ayers suggests. “Hypertext, in fact, could represent a new kind of rationality and empiricism.”¹⁶

In 1945 Vannevar Bush described for readers in *The Atlantic Monthly* the ways in which technologies, many of them developed in the Second World War, might enhance humanistic inquiry and offer new possibilities for handling the growing mass of scientific data. The problem Bush described seems only more pressing now: “The investigator is staggered by the findings and conclusions of thousands of other workers — conclusions which he cannot find the time to grasp, much less remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial.” Bush’s vision was for a machine he called “the memex”, a strikingly prescient description of a networked desktop computer. The machine would enable a scholar to map what Bush called a “trail” through the massive and growing scholarly record of evidence, data, interpretation, and narrative. Bush’s principle examples for the memex’s applications were spun out of history, and he considered historians strong candidates to become “a new profession of trail blazers, those who find delight in the task of establishing useful trails through the enormous mass of the common record”. As historians went about their noble work, Bush thought, they would leave nothing hidden from view, instead producing scholarship that was intricately connected in ways that could be accessed, replicated, and extended: “The inheritance from the master becomes, not only his additions to the world’s record, but for his disciples the entire scaffolding by which they were erected.”¹⁷

Historians have not rushed to respond to this mid-century call, preferring instead to carry on in the traditional scholarly manner. Perhaps the battles over social science history in the 1970s and the linguistic turn in the 1980s, especially among American historians, have turned them away from using computers in historical analysis. Undoubtedly, the conservative orientation of the profession places a high value on authorial narrative control and has limited experimentation. Still, in the last decade, as computers, the Internet, and programming languages have advanced to make possible much of what

16 See Janet Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (New York: Free Press, 1997); Edward L. Ayers, “The Pasts and Futures of Digital History” [online article], <http://www.vedh.virginia.edu/PastsFutures.html>.

17 Vannevar Bush, “As We May Think”, *Atlantic Monthly*, July 1945.

Bush envisioned, a few historians have begun to experiment with the creation of historical text encoding schemas for structured texts, the editing and assembly of digital archives, the production of digital scholarship, and the use of new tools of analysis from geographic information systems to language programmes. In a few years we might see new forms of scholarship, attuned to the spatial nature of the web and its browsing technologies, guided by the processing power of the computer, fed by the nearly limitless capacity of the disk, and read by an increasingly sophisticated and participatory audience. Perhaps, with time and some examples of successful digital scholarship, historians will become the “trail blazers” Vannevar Bush expected them to be.