DIGITAL HISTORY AND THE PUBLIC: ENVISIONING THE MISSISSIPPI VALLEY OF THE NINETEENTH CENTURY

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Although a number of leading scholars have rue’d the historical discipline’s increasingly tenuous ties to a general audience, academic historians and librarians have largely overlooked the World Wide Web’s ability to reach this audience in new ways. Instead, they have used new technologies largely to pursue disciplinary research agendas and develop a set of digital library resources designed with a limited audience in mind. This article suggests that a new approach to the use of digital technology can help scholars, with librarians’ assistance, to reinvigorate their relationship with the broader public. It uses a discussion of the Mark Twain’s Mississippi Project (http://dig.lib.niu.edu/twain), a digital library web site developed at Northern Illinois University Libraries in collaboration with Tulane University Libraries, the St. Louis Mercantile Library at the University of Missouri, St. Louis, and the Newberry Library, to suggest how academic humanists and librarians can work together, using a variety of media types, to create a new type of digital resource reaching beyond their familiar, specialised discourses. Framed by a focus on Mark Twain, one of American history’s most celebrated public figures and his colourful evocations of a specific past place, these can attract non-specialist users and help them to envision the past in new ways.

The humanities, and particularly history, stand to benefit from the development of resources providing online access to large amounts of primary source materials. But many of the academic librarians principally responsible for the development of online digital library materials have understood history and the other humanities in terms of their traditional user groups, that is, academic departments, populated by scholars and students, on their campuses. Scholars have the factual and interpretive knowledge necessary to understand primary sources in their historical context. In the classroom, students develop the information and skills necessary to learn effectively from primary materials.
as well. But what of individuals lacking professional training and not enrolled in an ongoing course of instruction? Some readers may build an understanding of historical context and interpretive themes, but many individuals lack the time or inclination to do so. The developers of the Mark Twain’s Mississippi Project believe that the general public also is a beneficiary of digital libraries, and they have sought to address these users by collaborating with humanists to create a set of original resources to complement the project’s collected primary sources, in part by representing and/or depicting them in new ways.

Most of the limited number of scholars who have produced digital products have mirrored librarians’ activities in the development of online digital archives of primary source materials. A few have sought to develop new forms of scholarly communication, including online articles enabling readers to review much larger amounts of supporting data than a traditional publication would allow. In 2003 historians Edward Ayers and William G. Thomas, III broke new ground with the publication of an electronic article, ‘The Differences Slavery Made,’ in the American Historical Review. Summarising their approach, the authors argued that they used digital media and the online environment to ‘give readers full access to a scholarly argument, the historiography about it, and the evidence for it.’ Taking another tack, David J. Staley has argued that historians should consider communicating with computer-generated visualisations. He concludes that ‘a visual display appropriately conveys historical information that a written account cannot… [T]he properties of visual displays are conducive to certain types of multivariate, multidimensional representation.’ He proposes that historians explore the practice of visualisation as an ‘alternative medium by which to think about and communicate our understanding of the past,’ and proposes ‘a scenario in which historians employ visualisations as vehicles for scholarly communication in lieu of traditional journal articles and monographs.’

While Staley lays out exciting possibilities for scholarly communication, the Mark Twain’s Mississippi Project uses the concept of visualisation more broadly to help a non-specialist audience to enjoy primary source materials. The project provides its users with an opportunity to explore the historical setting that Twain sketched out in The Adventures of Tom Sawyer (1876), Life on the Mississippi (1883), and The Adventures of Huckleberry Finn (1885) in a large set of searchable text and image materials that shed additional light on life in the nineteenth-century Mississippi Valley. In this regard it resembles the vast majority of online digital libraries. But the project website also employs a range of digital technologies to help non-specialist users envision an historical milieu that became a significant touchstone in Americans historical memory. These technologies include software explicitly designed to present humanities data in alternative formats, especially Geographic Information Systems (GIS), which the project expands and adapts in new ways. They also include more traditional
humanities materials, namely scholars’ discussions of Twain’s works and the historical context in which he set them, which appear as essays and streaming video files. These resources can serve as aids to visualisation in another sense.

Broadly conceived, visualisation of historical events from primary source materials represents an extension of the popular pedagogical practice of active learning. One author has summarised this approach to historical thinking by arguing that ‘As students work with primary sources, they have the opportunity to do more than just absorb information; they can also analyse, evaluate, recognise bias and contradiction, and weigh the significance of evidence presented by the source.’ Working with primary source materials also obliges students to construct a mental image of the historical events and the circumstances they describe. Much like Mark Twain’s novels asked readers to imagine characters they had never met and places they had never been, primary source materials examined at more than a century’s remove ask their users to imagine historical figures, circumstances, and events. In bringing scholars’ interpretations together with its multifaceted collections of searchable primary materials, the project provides its users today with an opportunity to knit these data together to picture the nineteenth-century Mississippi Valley (Figure 1) in more vivid, and accurate, detail.

I

The Mark Twain’s Mississippi Project Web site presents users with materials shedding light upon the historical setting in which Samuel Clemens grew to maturity, and which he remembered and imagined as Mark Twain in a series of celebrated works based in the Mississippi River Valley of the mid-nineteenth century. Many educated Americans, and a significant percentage of international World Wide Web users, profess familiarity with Mark Twain and his work, and several of his novels make up the project’s core. Mark Twain first evoked this landscape in his essay ‘Old Times on the Mississippi’ in 1875. He then revisited it through the youthful exploits of Tom Sawyer, Huckleberry Finn, and their young accomplices. With Life on the Mississippi, which built upon his ‘Old Times…’ essay, Twain explored how rapid technological and economic developments had changed the Mississippi Valley of his youth. Finally, in Huck and Jim’s raft voyage down the river in The Adventures of Huckleberry Finn, Twain addressed one of his era’s central social and political problems: the pervasive taint of slavery and racism in America.

While Twain’s fiction provides a uniquely vivid introduction to these topics, many other authors described them in works pertaining to the nineteenth-century Mississippi Valley as well. These accounts, including over one hundred travel narratives, immigrants’ guides, gazetteers, and reminiscences, drawn from the
collections of the collaborating institutions, provide readers with a richer, more
detailed aggregate picture of society and culture in the Mississippi Valley than
do Twain's works alone. Users may employ the PhiloLogic software suite found
on the project web site (provided by University of Chicago Libraries' Electronic
Text Services division and that institution's American Research Treasury of the
French Language (ARTFL) project) to search the texts for words or strings
of characters, or by author, title, or date. PhiloLogic is a powerful, full-text
search, retrieval, and reporting system for large databases with the ability to
understand complex text structures with rich metadata, including SGML. Unlike
other search software packages, PhiloLogic allows searches utilising several
items in a search field, as well as combined fields. One can also limit a search
by author and then further limit the search by date, genre, and/or title. While
users may simply search for words or strings of characters at any time, an
advanced search allows users to employ regular expression operators. These
implements are especially useful when searching materials filled with non-
standard spellings. Finally, PhiloLogic readily incorporates footnote materials
into text searches and allows users to move back and forth between the main

A set of nearly two thousand images makes up another set of primary resources, providing users with vivid depictions of locations along the river and the dynamics of river life. These materials include images drawn from the pages of the above texts, as well as others selected from participating institutions’ collections of visual resources. Available images include maps, photographs, engravings, and drawings, as well as musical scores. Project users may search these materials on the basis of information found in their metadata records through a database constructed with a MySQL database management system and PHP scripting. Users may also search musical scores’ lyrics in the project’s text database. Together, these tools make the Mark Twain’s Mississippi Project web site a broad and deep repository of materials pertaining to the river, its cities and towns, and its people in the nineteenth century.

II

The Mark Twain’s Mississippi Project provides users with several additional types of resources, each designed to help non-specialists to understand its subject matter and explore its collected materials. First, the project has created new digital representations of humanities data in order to make them more attractive and useful to a general audience. These include an interactive map created with GIS that provides graphical representations of a variety of spatial data in response to user queries, as well as new multimedia representations of other materials originally published in analog format. Second, the Web site provides its users with a set of original interpretive resources discussing its subject matter and the large set of digital library materials organised around it: the Mississippi Valley that Twain described in his celebrated Mississippi works.

The project map resource (http://atlas.lib.niu.edu/Website/twainviewer.htm) features a wide range of geographic and statistical information pertaining to the Mississippi Valley states, including the extent of the region’s road, railway, and water transportation network, as well as census data from the period 1800–1900. Historical statistics are available from a variety of university research projects. For decades, with few exceptions, only geographers and other social scientists have made use of them. Their tabular format, and the labor-intensive, sophisticated techniques required to handle and analyse them made these resources largely inaccessible to other users. Non-specialists could encounter these data in graphical formats, usually through individual maps published in newspapers, magazines, and textbooks. As static, two-dimensional images, these resources enabled authors to use spatially-oriented data to demonstrate a limited number of points or concept but defied attempts to explore these materials in depth. Today, GIS represents a leading example of the
new types of historical information that Staley has identified as visualisations; its enables a far broader audience to explore primary sources within their spatial context.

GIS software manages and displays map information in a database environment that enables its users to submit queries, which in turn instruct the software to create maps depicting only the types, or ‘layers,’ of information that the user has requested. For example, a user may request a map of a region representing its railroad network, on a specific date, alone, without the clutter created by other types of information. As importantly, users may view this result displayed on a map of population from one of the decennial US censuses. The ability to isolate, overlay, and display these layers of information makes GIS a formidable tool for the integration and analysis of a wide variety of data and provides individual GIS users with a flexibility that facilitates inquiry and research.9

In the years immediately following its introduction in the early 1990s, GIS users employed stand-alone computer workstations to tap databases and generate dynamic map resources. This state of affairs largely restricted usage of GIS’s dynamic data layering and map generation capability to advanced academic, corporate, and governmental users. But by the late 1990s GIS developers and vendors had begun to adapt their technology for use on the World Wide Web. This development placed the technology’s considerable analytical power within the reach of a much larger audience, including, potentially, the users of online digital libraries. Much like digital libraries employ metadata and full-text string searching to make text, image, sound, and video materials both accessible and subject to manipulation and analysis, Geographic Information Systems can unlock the potential of spatially-oriented data.

While librarians have explored how visualisation technologies affect their work, none have presented large sets of humanities data within an online GIS, in large part because of a lack of reliable software.10 For their part, humanities scholars have largely used GIS technology, in a standalone, or desktop setting for new types of scholarly research, while ignoring its potential utility as a vehicle for delivering data to a variety of audiences.11 More recently, Leta Hunt, a librarian, and Philip J. Ethington, a historian and librarian, have discussed ‘the utility of spatial and temporal organisation in digital library construction.’ They noted that digital library developers have largely directed their efforts toward building ‘specific genre databases,’ and argued that ‘digital library development should focus on the integration necessary for including information in multiple formats, relevant to many disciplines, and targeting a wide range of audiences for purposes of teaching, research, and public access…..’ What is required, they concluded, ‘is a spatio-temporal infrastructure that would allow users to go back in time as well as to ‘zoom’ in and out of space. The challenge is to blend geographical information systems (GIS) technology, standard search
and retrieval algorithms, and artistry to create and environment in which users can see the progress of time within the framework of the earth's surface in a compressed fashion, each layer bringing to life its physical and cultural space/time and enabling users to think differently about the questions they want to ask.12

The project team has implemented portions of Hunt and Ethington's vision of a geographically oriented, multi-media and interdisciplinary database that is technically and intellectually accessible to a large public through a GIS-facilitated interface and dynamic map generation that featuring layers of data from specific points in time. Project users may choose to examine data, such as total population, in map representations of the Mississippi Valley and its constituent states, in the specific years in which these data were collected. Most importantly, users may ask the GIS technology employed in the project web site to display multiple layers of materials simultaneously, thereby allowing them to gauge potential correlations, or lack of same, between the phenomena these data represent. GIS technology's ability to generate visual representations of a spatial context helps users to identify patterns in large sets of such data that long required lengthy and painstaking collation and analysis. In the example of railroads and population, users can examine the relationship of transportation networks to economic development. Although not new to scholars, this presentation of data has the potential to enhance understanding among general users.

The Mark Twain's Mississippi interactive map also enables users to find and examine text and image materials about specific places in the Mississippi Valley of the nineteenth century. For example, a user can compare Twain's description of St. Louis in 1882 with other accounts and depictions of that city by finding and selecting it on the interactive map (Figure 2). This selection presents the user with a list of authors' descriptions of the chosen location, and enables them to read and compare these accounts, thereby considering different authors' characterizations of individual places. This resource also allows project users to consider how these cities, towns, and other places changed over time. Featured accounts of towns, cities, or other locations, as well as relevant images, appear in this list in chronological order of publication. A separate request also produces a list of all project images, drawn from illustrated texts and archival materials, representing this location, once again presented in chronological order. Where previous GIS developers have used their technology to present users with spatially oriented statistical data alone, the Mark Twain's Mississippi Project interactive map integrates information in multiple formats. These include a digital library of humanities texts, images, and sound files drawn from several institutions, presented within a database integrated by space and time (Figure 3).

The project web site includes a collection of sound materials as well. Very few nineteenth-century recordings exist today, and none appear on the project.
web site. Rather, project staff members have identified and gathered mid-nineteenth-century sheet music describing and mythologising the Mississippi River, its valley, and its culture. Collaborating musicians from Northern Illinois University’s College of Visual and Performing Arts have recorded versions of these songs, and the project presents them on the site as streaming sound recordings (http://dig.lib.niu.edu/twain/sound.html).13

These materials represent a new chapter in digital library development, which typically makes information available without interpretation. By definition, singers and musicians interpret a musical score when they perform it. These interpretations might be described in reference to Staley’s general logic of visualisation. Much like maps and other visualisations convey spatial information more clearly and effectively than do text, and sound formats convey the information stored in a musical composition more fully than simple images and texts. Individuals able to read music might be able to imagine how a song sounds from its printed score and thus gauge its sensory and emotional impact, the vast majority of people cannot. Sound renderings of the notes, time signature, and words can remedy this deficit, in part. In this regard the
project's sound materials resemble its GIS maps, providing sonic representations of sheet music where interactive maps provide users with visual representations of quantitative historical data. Such new forms of information of course are not period recordings but the benefits to be realised by this technology can far outweigh potential liabilities if users are aware of the provenance and purpose of the sound files.

The Web site's interpretive materials provide users with another means by which they might envision, or imagine, the Mississippi Valley of the nineteenth century by means of expert interpretations. Interpretive resources include short essays by Twain scholar Gregg Camfield of the University of California, Merced; historian of antebellum America Peter Kastor of Washington University, St. Louis; and a team of historians of nineteenth-century America led by O. Vernon Burton of the University of Illinois. They also include video resources.
in which Camfield, as well as fellow Twain specialists Shelley Fisher Fishkin of Stanford University and Robert Hirst, editor-in-chief of the Mark Twain Papers Project at the University of California, Berkeley discuss Clemens' life and work as Mark Twain, as well as the context in which he lived and wrote.

These materials can illuminate major themes that emerge in the works of Mark Twain and other authors included in the project database. For example, a reader studying *Life on the Mississippi* may notice Twain's detailed discussion of economic and social changes in the Mississippi Valley of the nineteenth century. As a young man in Missouri, Samuel Clemens noticed the steamboats plying the river and idolised their pilots. He later remembered, in *Life on the Mississippi*, that 'when I was a boy, there was but one permanent ambition among my comrades in our village on the west bank of the Mississippi River. That was, to be a steamboatman.' When he became a river pilot himself, it marked a great accomplishment. But the Civil War soon intervened, and decimated the steamboat traffic on the Mississippi, much of which had carried commodities and goods between northern and southern cities. When, after a considerable sojourn in the West, Clemens emerged as a celebrated author writing under the pen name of Mark Twain, he noticed that railroads had largely supplanted steamboats as Americans’ principal form of transportation. While traveling in preparation for writing *Life on the Mississippi*, Clemens and his party arrived in St. Louis after a journey by train from New York, where they concluded that 'the most notable absence observable... was the absence of the river-man. If he was there... he was in disguise.' On the city's celebrated levee, the travelers found

half a dozen sound-asleep steamboats where I used to see a solid mile of wide-awake ones! This was melancholy, this was woeful. The absence of the pervading and jocund steamboatman from the billiard-saloon was explained. He was absent because he is no more. His occupation is gone, his power has passed away, he is absorbed into the common herd... The towboat and the railroad had done their work, and done it well and completely.

Clemens concluded that 'Mississippi steamboating was born about 1812; at the end of thirty years it had grown to mighty proportions; and in less than thirty more it was dead!'

Twain's story provides one man's account of a massive social and economic transition in American history, subjects that historians of nineteenth-century America have analysed in great detail. Their discussions can enrich project users' reading and understanding of *Life on the Mississippi*, and lead them to frame new questions to be pursued among the project's other primary source materials. For example, reference to geographical and demographic data presented in GIS maps can enable project users to place Twain's (and other authors') descriptions of
historical developments, like the rise of the railroad and decline of the steamboat, side by side with important aspects of the historical record as it exists today. Many users will find that these data underscore and amplify textual accounts of this place and time; some will find reason to re-evaluate and question aspects of these analyses.

For over one hundred years readers in the United States and around the world have relied upon their own imaginations, and perhaps a handy road map, to envision Mark Twain’s Mississippi. The Mark Twain’s Mississippi Project does not seek to replace individuals’ imagination with technology. Rather, it employs multimedia formats, interpretive materials, and Geographic Information Systems to enable readers to compare and contrast Twain’s memory and imagination with important elements of the historical record. Equipped with this broad set of resources, project users may dig deep into the milieu that Mark Twain shared with fellow denizens of the valley, and make a staple of historical memory for millions of additional readers in America and abroad.  

III

The Mark Twain’s Mississippi Project uses a variety of digital technologies to promote interdisciplinary collaboration with an eye toward bringing a rich collection of primary sources and interpretive materials to the large Web audience. This approach diverges from most librarians and humanities scholars’ present use of new technology and the web. Librarians seeking to make humanities materials available to users have in fact reached an audience comprised largely of specialised scholars and researchers. Daniel Cohen and Roy Rosenzweig report that the University of Michigan’s Digital Library Production Service, an early mover in the digitisation and web presentation of humanities materials and partner in the large Making of America Project (http://quod.lib.umich.edu/m/moagrp/), designed its resource to serve research universities and their graduate schools, and defined other potential audiences as ‘low priority.’ While the digitisation and presentation of library materials in online formats and the use of digital technology and the web in scholarship have made pivotal contributions to the humanities, the Mark Twain’s Mississippi Project suggests that digital library developers and scholars can complement these approaches by building a set of digital humanities resources able to reach an often-overlooked general audience.

This approach suggests that the presentation of online humanities resources can facilitate another type of visualisation as well. Many of the collected texts, like travel narratives and immigrants’ guides, grew from the American and European public’s hunger for detailed description of the American West. These materials helped readers to envision life in a region that then, as now, had achieved near-mythic status in the popular imagination, and to which
many hoped to emigrate. Today their vivid accounts of life in the nineteenth-century Mississippi Valley can help web users to imagine this place as well. The project's original interpretive matter, reflecting the scholarly literature in pertinent fields and juxtaposed with searchable primary source materials, can help non-specialists understand how these accounts join together in the historical record. Together with project materials that provide graphical/spatial and audio representations of primary source materials, these resources can help users to pursue active learning in new ways.¹

END NOTES

¹ In 1997 Joyce Appleby, in her capacity at president of the American Historical Association, suggested that all historians become public historians. She argued that, in addition to their scholarly work, professional historians have a responsibility to promote a better public understanding of how they go about the work of exploring and analyzing the past. She urged historians to "seek every possible opportunity to talk to a non-historian…about how history is produced." Quoted from Diane Britton "Public History and Public Memory," Public Historian 19/3 (Summer 1997): 23; Douglas Greenberg, ""History is a Luxury:" Mrs. Thatcher, Mr. Disney and (Public) History" Reviews in American History 26/1 (1998): 294–311; Thomas Bender ""Venturesome and Cautious:" American History in the 1990s" Journal of American History, 81/3 (December, 1994): 992–1003; "Wholes and Parts: The Need for Synthesis in American History" Journal of American History, 73/1 (June 1986): 120–36; Michael Calsy "History and the Public Purpose" Journal of American History 81/3 (December 1994): 969–976.

² Edward L. Ayers has remarked that "history may be better suited to digital technology than any other humanistic discipline." Edward L. Ayers, "The Past and Futures of Digital History," available at http://www.vchd.virginia.edu/PastFutures.html, 2 (accessed 17 June 2008).


⁶ This project identifies the Mississippi Valley for the purposes of its interactive map as those states bordering on the Mississippi River: Minnesota, Wisconsin, Iowa, Illinois, Missouri, Kentucky, Arkansas, Mississippi, and Louisiana.

⁷ Deanne Shirrona "Using Primary Sources on the Internet to Teach and Learn History" ERIC Digest, ERIC Number 442739, 1.
United States Census materials are available from the National Historical Geographic Information Systems Project at the University of Minnesota (http://www.nhgis.org); Historical United States County (HUSCO) boundary files are available from Louisiana State University's Department of Geoscience. The Newberry Library's United States County Boundary Project is working toward presenting a revised representation of these boundaries as well. Geographical data, including railroads, highways, cities and towns, as well as historical statistics, are available from the University of Virginia's Geospatial and Statistical Data Center at http://fisher.lib.virginia.edu/collections/stats.


Mark Twain The Adventures of Tom Sawyer (American Publishing Co., 1876); Life on the Mississippi (James R. Osgood, 1883); The Adventures of Huckleberry Finn (Charles L. Webster, 1885).

Ibid

