

**“Inventing the Map” in the Digital Humanities
(a Young Lady’s Primer)**



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In 1823, at a small school in western Vermont, Frances Alsop Henshaw, the 14-year-old daughter of a prosperous merchant, produced a remarkable cartographic and textual artifact. Henshaw’s “Book of Penmanship Executed at the Middlebury Female Academy” is a slim volume, later bound in marble boards, containing – in addition to the expected, set copy-texts of a practice-book – a series of hand-drawn, delicately-colored maps of our nineteen United States, each one paired with a geometrically-constructed and embellished prose passage selected from the geography books available to a schoolgirl in the new American republic.¹ Henshaw’s maps and texts alike are interpretive representations of the body of geodetic and descriptive literature from which she read geography. Formally, many of the textual passages that accompany her maps are designed within a framework of aesthetically-inflected cardinal coordinates, representing (either conceptually or in their spatial contours) the states they describe, and positioning political and natural boundaries in cartographically appropriate margins of the page [see Figures 1 and 2]. The book, clearly treasured, travelled west with Henshaw to Illinois, and later to Missouri, after her marriage to the clergyman and historian Truman Marcellus Post in 1835. It is the dated “April 29, 1823,” and bears an 1872 inscription to their oldest son, T. A. Post.²



Figure 1: Connecticut, one of 19 maps in Frances Henshaw’s “Book of Penmanship Executed at the Middlebury Female Academy,” 29 April 1823. Library of David Rumsey. List No. 2501.005. [See larger figure.](#)



Figure 2: Descriptive and positional text accompanying the Connecticut map; Frances Henshaw, 1823. Library of David Rumsey. List No. 2501G. [See larger figure.](#)

Henshaw’s “Book of Penmanship” is no less remarkable in its artistic and imaginative accomplishment for being exemplary of larger trends in the geographic education of nineteenth-century Americans. A sampler in codex form, it constitutes a set of interrelated pedagogical and personal exercises in geospatial and textual graphesis, or

subjective knowledge-production through the creation of images and texts-as-image.

This essay builds outward from Henshaw's lovely and deceptively naïve constructions to an analysis of the present state of geospatial scholarship in the humanities – particularly spatial analysis and practice as it relates to fields like literary and textual criticism, where geographic specificity may prove less important than interpretive possibility. Attention to the processes and products of Henshaw's exercises can be as fruitful for modern scholars, grappling with the integration of geospatial technologies into the interpretive humanities, as geographers and literary historians demonstrate the exercises themselves to have been for meaning-making among an increasingly literate populace in the early years of the American republic.³

Frances Henshaw was a pupil at the Middlebury Female Academy, the first school established by noted American educational reformer, Emma Willard. Willard had moved on from Middlebury by the time Henshaw was designing her map-book, to a larger role as a writer of treatises (including an 1818 *Plan for Improving Female Education*) and textbooks – beginning with *A System of Universal Geography*, authored with William Channing Woodbridge in 1822, and *Geography for Beginners*, published in 1826. Emma Willard is best remembered today as the founder of America's pre-eminent academy for young women, and particularly for future teachers. Her influential Troy Female Seminary, established in 1821 when she left Frances Henshaw's school in Vermont, is still in operation in upstate New York as the Emma Willard School for Girls.⁴ Frances Henshaw's *Book of Penmanship* makes clear, however, that the arts-based geospatial exercises Willard developed early in her career as a teacher – and on

which her later textbooks, spatial and temporal visualizations, and curricula were based – had endured among instructors and students at Middlebury into the 1820s.⁵

Willard's pedagogical innovation was to base geographical instruction and discovery-learning on the construction, by her students, of personalized, localized, graphical maps. While geography had long been accepted as a discipline suited to female education and was emerging as an important path to literacy and the development of a common national identity in early America, until the 1820s it was taught almost entirely through prose. The chief geographical textbooks of the day (Jedediah Morse's *Geography Made Easy* and Noah Webster's collection of grammars and spellers) were designed to suit a pedagogy that understood the cultivation of memory as a purely textual and verbal exercise. Jedediah Morse (who served as a primary resource for Frances Henshaw's work in 1823) offers complex and evocative textual descriptions of places and spaces on the American continent, but relegates maps to costly and less well-circulated supplementary volumes to his primary text. Likewise, Martin Brückner identifies Noah Webster's closest gesture toward *graphical* expression of geography in a prose "map" that positioned, without presentation of any natural or political boundary-lines, the typeset names of American states and European countries in rough spatial relation to each other.⁶ In contrast, Willard privileged the visual, asking her students to begin their mastery of American geography by sketching maps of the spaces and places well known to them – their homes, schools, villages, and towns. Willard's students then moved outward from local representation to national and international mapmaking, but persisted in the basic exercise of creating their own graphical visualizations as an aid to developing geospatial memory.

Susan Schulten, in an examination of Emma Willard's temporal and spatial mapping exercises, cites the cartographic impulse of her early pedagogical practice as stemming from a "more general fascination with the idea of graphic representation" (543). This fascination, which evolved and was tested at the Middlebury Female Academy, is everywhere evident in Willard's later textbooks – a body of work that quickly moved from synchronic spatial imagery in geography primers to diachronic geotemporal visualization in history books. A powerful graphic intervention in the field, this contribution is notable for having evolved through pedagogical and methodological practice to influential and widely-distributed printed expression in schoolhouse literature – leading Willard to make an unblushing claim: "In history, I have invented the map."⁷

A shift in scale.

In conceptualizing the modern landscape of the digital humanities, we often (as in Willard's cartographic pedagogies) move from a survey of local communities and networks to the sketching of path-finding representations of a larger field. Over the past two years, a set of activities focused at the Scholars' Lab at the University of Virginia Library has led my own research group into productive conversation with outside scholars, software developers, librarians, and archivists eager to contribute to a new community of practice. Local activities have included: implementation of an open source and web-services based infrastructure for discovery and delivery of geospatial datasets (including scanned and geo-referenced historical maps as well as complex metadata and vector and raster spatial data layers); design of geospatial technology seminars and training programs, meant to serve humanities scholars in addition to environmental

scientists and urban planners who have historically engaged with GIS (Geographical Information Systems) at UVA; support of projects undertaken by faculty and by our Scholars' Lab Graduate Fellows in Digital Humanities, among whom we note heightened engagement with geospatial technology and a distinct intellectual trend toward the study of space and place; design and hosting of the seventh annual Mellon-sponsored Scholarly Communication Institute, which focused on spatial tools and methods; and work on two projects funded by the National Endowment for the Humanities: the *Institute for Enabling Geospatial Scholarship* – a large-scale training program with tracks for librarians, programmers, and humanities scholars – and *Neatline*, a tool that allows scholars to express subjective, geographic and temporal interpretations of archival collections.⁸

Along the way, we have formed local, national, and international partnerships. We are heartened that our collaborators are not only librarians, scholars, and higher education IT staff, but also include representatives of the commercial and entrepreneurial “neo-geography” community and governmental and international non-profit agencies – groups whose external orientation aligns nicely with opportunities for geospatial technology in the public humanities. The rapid pace of these developments – moving outward from a simple resolution, in 2007, to get our own house of haphazardly-collected geospatial data in order and extend a hand to the local humanities community – demonstrates powerfully that there is great energy in this area of digital scholarship. We have also noted a shared eagerness in the wider community of scholars, administrators, and funders to bring geospatial approaches and tools into productive tension with the aims and customs of *interpretive* (as well as strictly analytical) humanities research.

I rehearse these developments in our local scene out of certainty that similar work and interest in the geospatial humanities is growing – at a variety of scales, and with a variety of institutional inflections – in libraries, academic departments, and digital centers around the world. And yet scholars interested in the documentary record immediately press up against a series of obstacles, pragmatic and conceptual, in their use of geospatial tools and methods. Solid work is being done in the area of historical, archaeological, and analytical GIS, but space and place are cross-cutting concepts that attract scholars from across the disciplines. Are the conditions ripe for new collaborative teams to posit with Emma Willard that – in the ongoing interchange of the larger digital humanities – *we could invent the map?*

I will argue that a fresh, steady look at cartographic and geospatial technologies for the digital humanities should not be taken alone in the context of spatially-oriented disciplines (such as anthropology, area studies, archaeology, urban planning and history, and environmental history) that have more traditionally made use of these tools and datasets and have, to greater and lesser extents, made peace with their present limitations – a set of assumptions that underlie and circumscribe the expressive power of geographical information systems. Instead, I want to extend our examination of GIS technologies and the administrative, pedagogical, and scholarly publishing systems that support them *into the realm of interpretive literary and textual studies* – and imagine them at a variety of scales: from support for complex mapping of print-culture production and distribution networks through space and time; to the visualization of highly subjective spatial expression within and about historical and literary documents; to an examination of the spatial and typographical features of a single page, or class of page

designs. What potential might geographical tools and methods have for illuminating the spatial, semantic, and intertextual features of books as well as landscapes? Can we imagine a next generation of these tools in support of visualization and aesthetic provocation for humanities interpretation?

If our aim is to promote, among colleagues in fields like literary studies and digital history, a new and timely engagement with geospatial visualization *as interpretive practice* (timely both in terms of the burgeoning development and use of what have been called crowd-sourced or “volunteered” spatial datasets and popular or “vernacular” interfaces outside of the academy, and in the context of a growing interest in a return to methodological training in graduate education within it),⁹ we must ask the following question: what is required of our shared tools, methods, and pedagogical practices to allow us to make as meaningful a visual and pragmatic intervention in our current scene as Emma Willard did in hers?

The deficiencies (from a humanities perspective) of existing geospatial applications and the social and academic systems that support and promote their use are well recognized. They have been thoroughly surveyed by Martyn Jessop of King’s College, London, who identifies four factors contributing to what he terms a strange “inhibition” of the use of geospatial information among digital humanists, a community not generally daunted by the need to learn new software tools, metadata standards, and data curation practices.¹⁰ The “first and most fundamental” of these inhibiting factors “concerns the use of data visualization and images *per se* in the discourse-based research methodology of the humanities” (42). That most humanities disciplines only make superficial use of images and image-based methodologies suggests an opportunity, if not

a need, to interrogate our habitual interpretive practices and the ways in which graduate education perpetuates a longstanding marginalization of the visual – particularly infelicitous in light of the opportunities for production and analysis afforded by new media.¹¹ Other factors involve our tools and the data we ask those tools to act upon: the suitability of current geospatial software packages to the treatment of issues like subjectivity and emotion, temporality as experienced and expressed in the documentary record, or interpretive inflection in the humanities; and those specific qualities of humanities information unsuited to software designed for synchronic analysis of incredibly dense datasets (rather than for sparse, temporally-inflected data), with a scientific eye toward filtering out – rather than celebrating and analyzing – uncertainties or ambiguities. Finally, Jessop treats broader issues of scholarly communication: issues in funding, producing, evaluating, and distributing innovative geospatial scholarship in disciplines whose structures evolved in response to different conditions and expectations. With Jessop, I will argue that, although geographic information science is often regarded as positivist and mechanistic by humanities scholars, “its greatest contribution to the humanities... may be not as an analytical or information presentation tool but as a reflexive one,” allowing us not only to engage with the “highly experiential” and qualitative features of our datasets, but also to reflect on how we construct our disciplines (48).

Frances Henshaw’s “Book of Penmanship” – which we might view as a sophisticated 1820s pen-and-ink GIS – serves here as an example of both an illuminative process for, and a potential exemplary product of, hermeneutic involvement on the part of scholars with textual surrogates and geospatial interfaces. We lack digital tools expressly

crafted to promote the kind of ludic and spatial engagement with book design and geographical expression that is everywhere evident in the Henshaw cartifact. But the components of these tools are all around us. It is less a technical than an institutional and intellectual problem to identify the small pieces – and practices – that must be loosely joined in order for scholars interested in aesthetics and the interpretation of literary and cultural documents to move forward in the arena of geographic and textual graphesis, or knowledge-making through visual expression.

Is there a methodological approach that presents itself as a way to crack open analytically – or perhaps just allow us to *replicate* and *play* with, in digital environments – the easy brand of spatial and literary intertextuality evinced in Henshaw’s schoolgirl exercise? Several classes of tools and digital humanities practices might be examined in order to get at this question, including: the iterative, interpretive, and structured sketching prototyped in Temporal Modelling and Neatline; the concepts of “aesthetic provocation” and the “inner standing point” as materialized in the Ivanhoe Game; options for data-mining for geography in massive text corpora through tools like MONK and TAPoR, and what the Google Books research repositories and efforts like HATHItrust and OCLC must enable in their APIs to contribute to this field; textual and graphical collation interfaces predicated on visualization rather than – or as much as – on structured markup (such as Juxta and Sapheos); the narrative and ludic affordances of mobile, GPS-powered tools and toys; the nature of map libraries, online and off; and of powerful, analytical desktop and web-based GIS applications, not at all designed for hermeneutics and textual studies, but ready nonetheless for some dedicated gate-crashing. This article will treat

only a few of these tools and methods, but will, I hope, provoke thought about the possibilities of a wider set of them in the context of the Henshaw document.

Orienteering.

Henshaw's book, available as high-quality page scans in the open-access repository of map collector David Rumsey, must be historically situated before we can examine, in a modern context, the spatial practices it models. Its production follows a rise, beginning in the 1790s, of embroidered sampler-work that added cartographic representation to the more conventional alphabetic and didactic texts that had long characterized schoolgirl embroidery.¹² As briefly described above, Henshaw's document itself is a witness to the emergence of geographic education in the early American republic and helps to illuminate the contributions of Emma Willard and her peers to a complex, shared textual and visual endeavor of nation-building in the early years of the nineteenth century. Martin Brückner's treatment of the relation of geography and geodesy to literacy and national identity in the American colonies and newly-united States, and Susan Schulten's placement of Willard at "the graphic foundations of American history" offer a necessary background to an appreciation of Frances Henshaw's exercises.

It is, however, an 1840s critique by Marcius Willson of Willard's textbook maps as "insufficiently *geographical*" and "focused instead on *human* events and boundaries" (*my emphasis*) that gets at the heart of her enterprise, Henshaw's exercise-book, and the example they offer to spatially-minded scholars of the interpretive humanities.¹³ Susan Schulten cites this criticism as an attack by a rival author on Willard's attempts to

“reconceptualize the past on a plane rather than in a narrative” (554). It is essential that we recognize the necessity, for such a reconceptualization, of emphasis on perspective and dimensionality in both spatial and temporal visualization. In moving from geospatial to spatialized temporal depictions – that is, from geography to history – Willard produced fold-out “chronographer” timelines that depicted events and cultural influences as a river widening toward the present-day reader at the bottom of the page, and structural “temples of time” that raised architectural columns and a pediment of historical personages above the chronographic streams that now presented themselves on and as a mosaic floor.¹⁴ In both cases, these visualizations emphasize the subjective positioning of the viewer or interpreter through means of exaggerated visual perspective.

Graphesis, perspective (both conceptual and pictorial), and a necessary, attendant privileging of individualized response are hallmarks of Willard’s later geographic and visualized historical pedagogy. A product of Willard’s curriculum and educational philosophy, Henshaw’s “Penmanship” document shows us one way these basic principles played out in nascent form, played out in text and watercolor on an American landscape in 1823.

In thinking and talking about Henshaw’s work over the course of the past year, I have been surprised at the response of many GIS professionals to my questions about what their tools might offer to scholars of cartography, art history, literary studies, and the history of the book.¹⁵ My inquiries are admittedly as cartographic and exploratory as they are geospatially-grounded or analytical. A common conclusion is that the research and interpretive questions Henshaw raises are “inappropriate to GIS,” because they lack sharp geographic focus on coordinates entirely within a real and not partly-imagined

world, and (in their exploratory dimension) they lack clarity about what might constitute an acceptable answer to be derived from GIS tools and methods. (In that sense, they open themselves, like Emma Willard's "insufficiently geographical" focus on subjective imagery and lived experience, to Marcius Willson's old critique.)

This orientation toward spatial tools and methods is succinctly stated on the very first page of Gregory and Ell's *Historical GIS: Technologies, Methodologies, and Scholarship*: "the researcher using GIS should be asking, 'What are the geographical aspects of my research question?' rather than 'What can I do with my dataset using this software?'"¹⁶ An appropriate GIS inquiry along these lines may be exemplified by Anne Knowles's beautiful study, "What Could Lee See at Gettysburg?" which is able to get at qualitative and psychological questions of battlefield strategy through analytical work on an historical viewshed.¹⁷ Though highly effective in putting GIS tools to the purposes for which they were designed and assisting scholars in getting more rapidly to answerable questions, the "appropriateness" stricture voiced by Gregory and Ell is unnecessarily limiting with respect to experimental visualization practices in fields like literary and textual studies.

An examination of spatial decision-making and of the interplay among text, image, and geographical source material in Frances Henshaw's "Book of Penmanship" suggests relations among her enterprise and the hermeneutic possibilities some scholars intuit for geospatial technology in the humanities. These relations hinge on openness of the academy to graphesis and iterative design as legitimate methodologies in digital scholarship. It is not my aim to argue this consideration here. It may be enough to show

how fascinating and delightful Henshaw's enterprise is, and to move through the ways in which I began to analyze it.

I first encountered the "Book of Penmanship" in person, during a visit to David Rumsey's library, when I idly inquired whether his collection included maps designed by or for children.¹⁸ I had in mind another subjective mapmaking exercise – a family letter, in the University of Virginia's Special Collections library, in which Civil War cartographer Jedediah Hotchkiss (on the scene to make tactical maps for Stonewall Jackson's troops) sketches the battle of Fredericksburg in a manner suited for the eyes of his young daughter, Nellie.¹⁹ In response, Mr. Rumsey shared the Henshaw book. It triggered many of the same associations for me as the Hotchkiss document, and I had the opportunity to pore over it for a short while. Nothing more was known of its history than was evident from the title page, and subsequent research revealed that mis-readings of Henshaw's name ("Frances H." for "Frances A.") and of the its inscribed date ("1828" for "1823") had further obscured the book's provenance.²⁰

I relate this sequence of events because – even though David Rumsey has been remarkably generous in making his private collection available online, and has invested personally in the development of technology to share and distribute maps (including creation of the Luna Browser and partnerships with Google Earth and Second Life) – I am confident that my interest and engagement with the book was heightened by an initial, physical encounter in a way not presently enabled through digital library interfaces. My critique is not a tired one about the "aura" of the book. I am too deeply appreciative of the individuals and institutions working to make cultural resources such as these freely

available over the Web. Instead, this encounter encouraged me to reflect on and talk with other scholars about the differing affordances of physical and virtual map libraries.

University of Virginia map historian Max Edelson characterizes his experience in physical Special Collections libraries as a series of tantalizing glimpses that thwart real comparative, analytical attention: “they bring one map out,” he said, “and take another away.”²¹ Tools that emerged from image-based humanities computing projects a decade ago – like the Blake Archive’s image viewer and Matthew Kirschenbaum’s “virtual lightbox” – offered more sophisticated comparison modes, but many of the digital library “lightbox” widgets currently en vogue take a step backward, in centering on only one image at a time – or offering a dazzling wall of images, interesting in that they provide a macro-view of an entire collection, but ultimately poorly suited for close comparison and scholarly attention. Rumsey’s interface, like that created by Nate Strout in consultation with Diana Sinton at the University of Redlands, offers the capacity for free positioning and synchronized scrolling of a set of maps aligned for simultaneous examination.²² Not supported are re-projection and geo-rectification (warping of one map to fit another) or the creation of freely-adjusted transparent layers for examination of maps in overlay on each other, or against a standardized geospatial or political base map. This kind of operation has long been available in proprietary, desktop GIS software. However, the hurdles of training and expense, as described above – along with a (self-perpetuating) dearth of stimulating examples of humanities interpretation done through high-powered, desktop geographic information systems – have resulted in poor penetration of these technologies in literary and cultural studies.²³ For interpretive humanities scholars even to begin to engage analytically with GIS, it is critical that we bring to bear the same Web

browsing platforms through which (increasingly) they *discover* historical maps and geospatial information – and that we improve that process and move it from the realm of catalogue and text search to true spatial discovery. Research and development groups at the University of Virginia Library and the New York Public Library, alongside specialized scholarly projects like Pleiades, the Tibetan and Himalayan Library, Harvard AfricaMap, and Hypercities, are making advances in this arena.²⁴

But most of these interfaces persist in treating maps as unary objects – with little attention to the special affordances of *books of maps*, or *maps in books* – and certainly little appreciation for the codex form and interplay of print or manuscript text and cartographic imagery, in the way that bibliographers and textual critics would like to examine them. For example, although the Henshaw book contains 57 leaves, only 39 were originally available to me through the Luna browser interface when I returned home. At my request, David Rumsey later kindly scanned more pages, to place online the ones that bore copied text not directly correlated to the 19 graphical maps in the volume. Grasping at ways to continue to consider the Henshaw book as book, even on the screen, I downloaded these open-access images and began putting them into a simple “page-turner” interface of the sort I had rarely found useful or interesting for literary documents. I was quickly stymied by a lack of verso scans. Quite understandably, given the gallery-like and single-image affordances of common Web interfaces for map collections, it had not been at all evident to Rumsey and his staff – nor had it even occurred to me, until I began to remediate the book as e-book – that the needs of a textual scholar would also be served by scans of blank pages.

My point is not that we require one interface that is all things to all people. It is rather that basic information-sharing protocols should exist that offer flexible ways to access and manipulate geospatial and cartographic information, including historical scanned maps (rectos and versos!). Most important for engagement by humanities scholars is that these protocols function well with information derived from the historical record – from the world of broadsides and atlases, manuscripts and books – and that they foster iterative thinking and work as part of the read/write Web. Scholars should educate themselves about the possibilities of Web service protocols like WMS (Web Mapping Service) and WFS (Web Feature Service), and of APIs (Application Programming Interfaces) that open up GIS data and cartographic imagery – alongside bibliographic and textual data and imagery – to the huge variety of analytical and access-oriented applications that researchers and software developers could collaboratively imagine.²⁵ Then we must seek out the partnerships with libraries and digital humanities centers and institutes that can give our imaginings form.

Graphesis and a geographical education.

I turn now to an examination of Frances Henshaw's enterprise, with an eye toward what it illuminates and obscures.

The first 35 pages of the "Book of Penmanship" consist of astronomy, geography, and American history texts, primarily copied from a pre-1814 Thomas and Andrews printing of Jedidiah Morse's *Geography Made Easy*.²⁶ These passages seem to have been selected, by Henshaw or her schoolmistress, for their instructional value as a basis for geographical understanding. The first of them, headed "Astronomical Geography,"

posits that “a complete knowledge of Geography cannot be obtained without some acquaintance with Astronomy.” Henshaw duly proceeds to abridge and copy passages on “the several Astronomical Systems,” including the Ptolemaic, Brahean, and Copernican – one per page, presented in ornamental styles [see Figure 3]. Tables of astronomical distances, symbols, and periods follow, as do sections on comets, the “doctrine of the sphere,” the equator, meridian, tropics and colures, poles and zones, and principles of latitude and longitude. In the style of Morse, and despite a geometric and spatially-descriptive bent to the content of the text, all of these sections are presented by Henshaw without meaningful illustration – beyond an ornamental flourish or two, and a page on the calculation of the “ecliptick” enlivened by a branch of painted roses. In other words, no diagrammatic impulse is evident in the opening pages of the book. Images are not offered here as aids to the understanding of quite complex geospatial and astronomical relations Henshaw expresses in prose.

Perhaps indicating the focus of the remainder of the volume and of her lessons in an Emma Willard-influenced school, the introductory section of Henshaw’s book concludes with her own abridgment of an historical text: Jedidiah Morse’s Columbian “Discovery of America.” Interestingly, in moving to history, Henshaw skips over some of Morse’s most direct and provocative instructions for the design and reading of maps. This is a section of *Geography Made Easy* (itself largely devoid of cartographic illustration) which proscribes – again in prose – a symbology for rivers, mountains, forests, harbors, and roads, and offers a fanciful justification for disparate conventions in cardinal directions, concluding: “in books of geography therefore by the right hand we must understand the east; in those of astronomy, the west; in such as relate to augury, the

south; and the writings of poets, the north”(28, “Of Maps and Their Use”). The cartographic exercises in Henshaw’s book will hover opportunistically between geography and augury, as the shape of states often dictates the positioning of illustrations and therefore the orientation of her maps. Texts, however, when Henshaw imagines them as operating within a framework of Cartesian coordinates, invariably mark north (with the geographers, rather than the poets) at the top of the page.

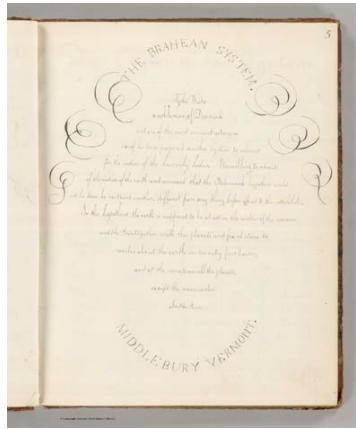


Figure 3: “The Brahean System.” Frances Henshaw, 1823. Library of David Rumsey. Note that Henshaw, either in the style of embroidered samplers or subtly honoring the emphasis on the local in Willard’s geographic pedagogy, balances her design with a positional heading: “Middlebury, Vermont.” List No. 2501X. [See larger figure.](#)

With no particular introduction or indication of a shift after the historical copy-exercise, Henshaw’s penmanship book then opens up into a series of 19 hand-colored maps and accompanying texts, at least ten of which have been designed to sit in a particular spatial relationship to the American states they describe. The maps are organized on a principle of adjacency, and, in order, comprise: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia (including what is now West Virginia),

North Carolina, South Carolina, Georgia (including the western panhandle of the Florida Territory), Tennessee, Kentucky, Ohio, and Indiana. By the time of Henshaw's writing, in 1823, 24 states had joined the Union. She does not draw Louisiana, Mississippi, Illinois, Alabama, Missouri, or any of the territories – but does, however, implicitly represent Maine as a state rather than as a district of Massachusetts (which it remained until the Missouri Compromise in 1820). Henshaw's choices seem to reflect the conceptual and actual limits of American statehood in the atlases available to her at home and at school – identified in Rumsey's catalog as the 1805 edition of Carey's *American Pocket Atlas* and an 1812 edition of Arrowsmith and Lewis. The Rumsey metadata also concludes that Henshaw's Indiana was drawn from an “unknown source.”²⁷ In addition, the vast Louisiana Purchase, from which Louisiana was codified into statehood in 1812 and which was indeed represented in the Arrowsmith and Lewis volume, is omitted entirely.

If – as it seems – Henshaw is selecting, consciously omitting, and recombining maps for representation in her book, can any principles on which she bases that activity be discerned from an examination of the documentary record? A few, simple searches in full-text archives – followed by rudimentary collation of a sampling of passages using Juxta – led me to a wealth of information and an ability to draw reasonable conclusions about the sources for Henshaw's prose.²⁸ But a similar research approach to the geographical imagery in the book is almost unimaginable, because we lack sufficiently-large, open corpora of scanned historical maps and widely-adopted systems for identifying, geo-rectifying, comparing, and collating them. What would it take, both technically and socially, for libraries, archives, and other data providers to enable fluid

discovery of maps and lay the groundwork for collation of them, as they have done for texts?

The audience of map historians may be forever too small to support such a vision at Google-scale. However, Henshaw's manuscript – because it combines cartographic representation with other graphical flourishes and textual ornaments – illustrates powerfully that many of the same protocols and software tools that would promote sophisticated research on historical maps would also be of use to scholars of book history and graphic design. Clearly, textual ornaments and graphical features of both manuscript and print texts lack the lingua franca of real-world geospatial referents that make maps mutually intelligible, and their embedded coordinates and systems of scale are not procedural (or process-able) as are maps warped against particular geographical projections. But what might comparative searches across vast textual and graphical corpora, aided by image-recognition software operating at a variety of scales, teach us about the history of such documentary markings, or about the informational and artistic structures in which they are positioned?²⁹ What might a process like geo-rectification reveal when performed across a set of similar textual features over time and in a variety of media – features like, say, the flourishes in Figure 3, above? And how might the limits of this activity – imposed by the same lack of common, standardized, or “actual” spatial datapoints that sometimes provoke experienced GIS users to identify humanities queries as inappropriate to GIS – illustrate the limits of the tools and systems we have inherited from the sciences? How might they illuminate the impulse of humanities scholars to “rectify” historical and imaginative maps *against each other*, not only against a modern, accepted street grid or set of GPS-derived datapoints? If our current suite of GIS tools

aren't the 'droids we're looking for, where are they? – or what should we understand and carry over from geographic information science in order to build them within a humanities framework?

Figures 1 and 2 above – the Connecticut pages – are typical of Frances Henshaw's marriage of text design with geospatial visualizations of the American states. However, each map/text pair in her book is arranged differently. Henshaw also makes unique textual, geographic, color, and design choices throughout the book, including choices about the shape and nature of the textual passages that accompany the maps. We will examine only two further pairs here, by way of briefly demonstrating the subjective character of her work and the degree to which she both performs within and presses against cartographic norms.

The first pair presents the state of Virginia in its antebellum contours. About the graphical map (Figure 4) I will note only that the political boundary of the northern panhandle is treated in a noticeably lighter wash of color than is the natural, geographical boundary of the Monongahela River – itself by no means as wide as depicted in Henshaw's drawing. Was a merchant's daughter simply sensitive to waterways? A close examination of her source maps and of Henshaw's treatment of natural and political boundaries in other drawings would be necessary in order to draw conclusions about her choices here – and most crucially to avoid reading too much into a set of schoolgirl drawings. It is, however, tempting to think that we may observe an unresolved tension between two conceptual layers or dimensions to the map in this region, as represented by Henshaw on a single plane. (Argumentation and accurate or inaccurate representation through the symbologies and aesthetics of maps require a brand of cartographic decision-

making just as necessary in the framework of our current GIS toolset³⁰ – but it is interesting to contemplate the degree to which modern tools have conditioned us to disambiguate spatial data into “layers.” Textual scholars will recognize the tension between informational and poetic or aesthetic structures in maps – and the degree to which computer representation does violence to ambiguity – as akin to the longstanding issue of “overlapping hierarchies” in TEI markup.³¹)



Figure 4. The state of Virginia by Frances Henshaw, ca 1823. Library of David Rumsey. List No. 2501.012. [See larger figure.](#)

We’ll shift now to the textual representation of the state of Virginia, which is useful to us in thinking through the rules Henshaw sets for herself in her artistic production, and the occasions on which she permits them to be broken. At least ten of Henshaw’s 19 state-by-state textual passages are laid out, as described above, within a Cartesian grid in which the north/south axis is drawn between the top and bottom margins of the page. Implied cardinal directions for Henshaw’s *texts* (with the gutter of the book invariably to the west) hold even in cases, as with the Virginia, where the shape of the corresponding state *map* prompts Henshaw to maximize drawing space by placing it lengthwise on the page – and therefore orienting it on a different north-south axis.

Henshaw suggests directional or map-like qualities to her textual passages through insertion of boundary notations, in which she locates and labels – as in the Connecticut map, Figure 2 – the neighbor-states and bodies of water bordering her state of interest. Such notations (“Bounded North by Massachussetts,” “south by the Atlantick,” etc.) are positioned appropriately in the margins, given the convention that figures northerly orientation toward the top of the page. A notable exception to this convention exists in Henshaw’s textual representation of the state of Virginia (Figure 5).



Figure 5. Text accompanying the Virginia map, Frances Henshaw, ca. 1823. Library of David Rumsey. List No. 2501N. [See larger figure.](#)

Here, she offers a fairly un-poetic and disjointed selection of passages from *Morse’s Geography Made Easy* – and caps her penmanship exercise with an elaborate ornamental cherub holding a sweeping ribbon or banner emblazoned with the state name. Because the cherub occupies the “northern” field of the page, Henshaw is unable to position her “North by MARYLAND” boundary label appropriately. The aesthetic force of the textual ornament, in other words, has trumped directionality. Maryland is now

displaced to the west – where it crowds Kentucky toward the south, into a position where one might now seek, and fail to find, Tennessee.

A second set of pages, treating the state of Ohio, demonstrates similar interpretive and aesthetic decision-making in the construction of text/map pairs. Here, Henshaw's text (Figure 6) lacks labeled directionality but may have been designed to echo the rectilinear north and rough diamond-like shape of the southern portions of Ohio, as she depicts it cartographically on the previous page. At least two editions of *Geography Made Easy* and possibly three or more source documents seem to have gone into Henshaw's selection and editing process for this very short passage. Her reference to Indian mounds and earthworks (the "number of old forts in Kentucky county" which are "the admiration of the curious and a matter of Speculation") can be traced to an 1802 edition of *Geography Made Easy* which pre-dates Ohio's statehood by a year – a book that terms this region of interest the "territory NW of the Ohio [River]." Henshaw's copy text for her final statement, that the Ohio River "nearly half surrounds the state," only appears in later, post-statehood editions of Morse's textbook. I am unable to locate a source for her seemingly erroneous statement that Columbia is the "seat of government."



Figure 6. Text accompanying the map of Ohio, by Frances Henshaw, ca. 1823. Library of David Rumsey. List No. 2501T. [See larger figure.](#)

It is, of course, possible that continued digitization and open-access publication of searchable geodetic documents from the early 19th century (a period of rampant copying and borrowing) will reveal other, perhaps amalgamated, sources – but it seems that Henshaw has taken a deliberately pastiche approach to assembling texts, even in this very brief passage. I am attracted to an interpretation of her textual methods as patchwork, because I feel that it suggests parallels to the graphic design of the page. Henshaw’s choppy Ohio passages are most legible to readers who understand the construction formula of interlocking light and dark angles in a traditional “log cabin” quilt square pattern.³²

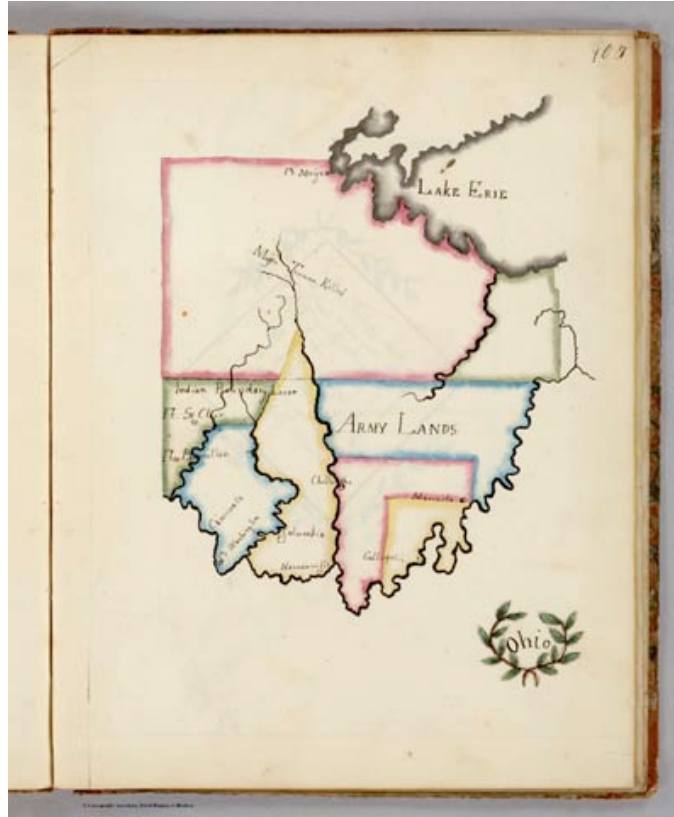


Figure 7. Map of Ohio by Frances Henshaw, ca. 1823. Library of David Rumsey. List No. 2501.018. [See larger figure.](#)

The map version of Henshaw's "Ohio" (Figure 7) is equally interesting as a study in interpretive selectivity. David Rumsey identifies her source for this drawing as differing from that of all but one other map in the booklet, concluding that Henshaw has used an 1812 edition of Arrowsmith and Louis (Figure 8) rather than her wonted 1805 Cary's *American Pocket Atlas*.

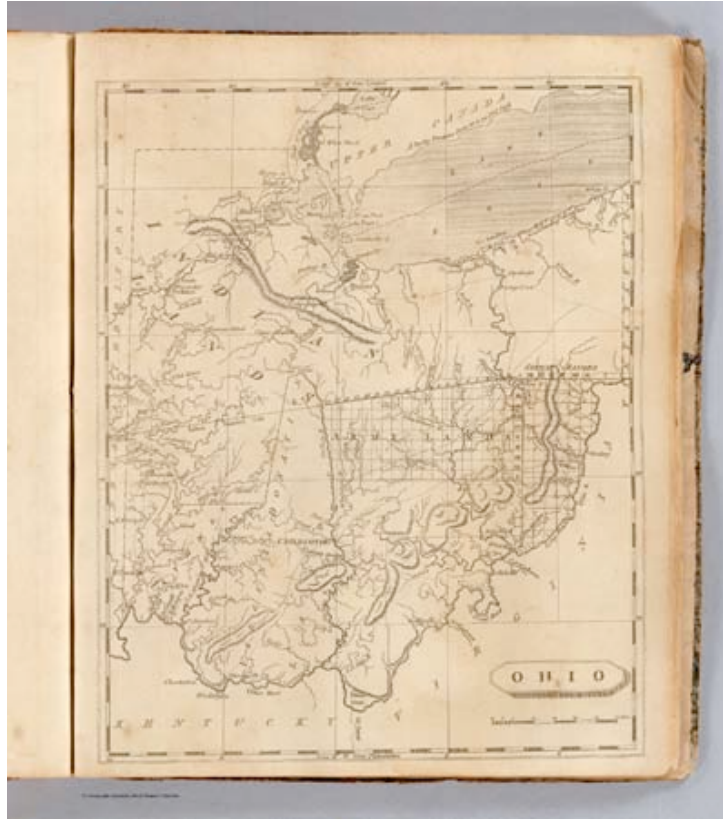


Figure 8. Map of Ohio by Arrowsmith and Lewis, 1812. Library of David Rumsey. List No. 0028.048. [See larger figure.](#)

I am skeptical about this attribution, or would at least like to suggest that Henshaw employed multiple sources for her graphical map in the same way she did for her textual representation of Ohio. This is because I note significant differences in the positioning of rivers, boundary-lines, and settlements between Henshaw's map and her putative 1812 source. Some of these differences (like the strong east/west line of the Indian Boundary, which appears in Arrowsmith and Louis with a distinct northwesterly pitch) may be accounted for by free-hand drawing and creative interpretation, but spelling changes (like "Cincinata" for "Cincinnati") and the complete absence of a referent for Henshaw's "Ft Meigs #" notation indicates that further investigation is warranted. A first step would involve collation (with and without georectification) of

possible source maps, and as careful an examination of historical place names as was necessary to draw conclusions about her sources for the Ohio text page.

But this map also suggests a need for further research in Emma Willard-inspired geospatial pedagogy of the 1820s. Is it possible that Henshaw was analyzing an un-visualized geodetic text, like that of Morse, and attempting to position forts and internal boundary-lines based on descriptive prose? The “Cincinata/Cincinnati” shift, and a parallel substitution, on Henshaw’s map, of “Nassauville” for “Masseyville,” also suggests an aural component to her exercise. Could, for instance, a schoolmistress have been reading aloud and directing her students to make imaginative placements on the sketched maps before them? Whatever Henshaw’s cartographic practice may have been, it is clear that it is predicated on selection and interpretation, rather than completeness and verisimilitude. Are these emotional landscapes? Despite the overwhelming density of geological features, waterways, settlements, marked historical events, and placenames which – in her possible sources – fill the “Indian Lands” of northern Ohio, Henshaw’s map contains a solitary, poignant notation: “Major Truman killed.”

Analysis of the production process for cartographic artifacts like this is perhaps best done through experimental performance of similar processes – in the way that students of bibliography may fold sheets into gatherings better to understand the construction of a book. Our current digital toolsets have been designed neither for creating documents like Henshaw’s nor for analyzing them – but that is not to say that they are completely infelicitous in either of those contexts. We might take the constraints of existing GIS software – in handling ambiguity, imaginative and variable spatial metrics, sparse and imprecise data, interpretive selectivity, and the subjective and

aesthetic dimensions of cultural production – as constructive, not merely constrictive, in relation to spatial inquiry and expression in the digital humanities. We see all of these problems in even a cursory glance at the Henshaw document. And Henshaw’s work also offers us an opportunity to examine artistic constraint – the rules she inherits or imposes for her textual and visual exercise, thrown into relief (as with the warping cherub of Virginia) when she bends them.

The *intellectual* framework through which humanities scholars approach geographic information systems will undoubtedly owe as clear a debt to the arts as to the scientific disciplines from which GIS tools and methods are derived. Therefore simply operating, in a reflective way, within the *mechanical* frame presented by these tools may be as useful to us in analyzing documents like Henshaw’s as would be the creation, from whole cloth, of new spatial tools and methods expressly designed for humanities inquiry. We would do well to look closely at liberating and ludic aspects of constraints-based methodology, recognized by wranglers of poetic form throughout history, and self-consciously addressed through aleatory and procedural experimentation in 20th-century art and poetry. This is well-trodden ground, for which our best pathfinders are not critics, but performers and practitioners.³³ English artist Bridget Riley writes lucidly, for instance, about the degree to which “prohibitions and denials are always a challenge and a powerful spur to inquiry.”³⁴

New landscapes.

The principles on which I posit Henshaw’s book is constructed – Emma Willard’s pedagogical emphasis on graphesis and privileging of the subjective, interpretive

response – are the same principles on which Johanna Drucker and I based our “Temporal Modelling” prototyping exercise, ca. 2001. This was a project for the iterative sketching of subjective, humanistic timelines, which Drucker cites as a digital humanities success story in “demonstrating that visualization could serve as a method of creating interpretive analysis, not merely of displaying it.”³⁵ While Temporal Modelling and its sister project, the Ivanhoe Game, were not conceived in a geospatial framework, they may serve to illuminate a set of questions motivating humanities scholars who experiment in the interpretive margins of computer-assisted research on space and place. These are questions about the aptness of various methodological approaches to subjectivity, ambiguity, aesthetic provocation, and knowing through sketching in visual environments.

My design for a Temporal Modelling prototype stemmed from our research into both traditional and highly idiosyncratic representations of time and temporal relations, and from conversations with scholars from a variety of humanities disciplines – not only about how they might wish to visualize events, points, and intervals in their areas of study, but also how acts of visualization could function as part of their interpretive processes, and what (both conceptually and practically) an experiment in graphesis might return to their work. We ultimately produced, in collaboration with Jim Allman and Petra Michel, the Temporal Modelling “PlaySpace,” a tool built around an empty stage, extensible both as a plane and in the free addition of transparent layers, on which users could spawn, populate, label, color-code, adjust, connect, or delete timelines that made few assumptions about regular metrics, directionality, causality, and influence.³⁶

The tool was designed to enable an iterative and (for many of its users) *new* spatial or visual engagement with primarily narrative and documentary objects of study.

Temporal Modelling was to be an experiment in *visualization as a data modelling method* in the digital humanities. Bridget Riley reflects on the brand of graphesis we were trying to promote, in which “drawing is an inquiry, a way of finding out,” played out in the marking of an indeterminate field:

It is as though there is an eye at the end of my pencil, which tries, independently of my personal general-purpose eye, to penetrate a kind of obscuring veil or thickness. To break down this thickness, this deadening opacity, to elicit some particle of clarity or insight, is what I want to do... It is this effort ‘to clarify’ that makes drawing particularly useful and it is in this way that I assimilate experience and find new ground.

You cannot deal with thought directly outside practice as a painter: ‘doing’ is essential in order to find out what form your thought takes... It is only through the experience of working that answers may be discovered within the inner logic of an invented reality such as the art of painting.³⁷

We conceived Temporal Modelling as an intervention in the field of humanities computing, which was, at that time and from our vantage point at the University of Virginia, preoccupied with purely textual and informational approaches to literary scholarship. In common digital practice, the visual – if it were fore-grounded at all – emerged passively and algorithmically as a product of structures developed in the abstract and expressed in words. We wished to turn this practice on its head. Visualization would not be a final, algorithmic output of ontology design and database creation or text markup, but rather an integral part of the very *process* of data modeling. The first phase of our project was completed in 2002.³⁸

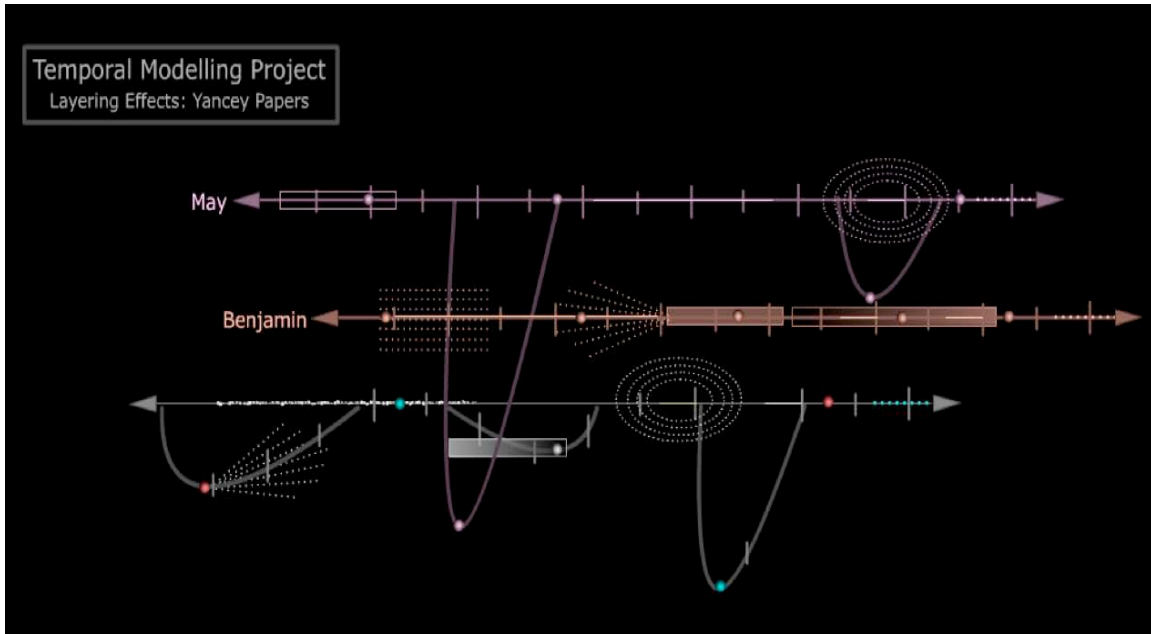


Figure 9. 2001 design sketch by Bethany Nowvskie, Temporal Modelling Project

We were led to a second (uncompleted) phase of Temporal Modelling activity by a conviction that, in Riley’s terms, the “inner logic of an invented reality” – which scholars might wish to express by using our tool for literary interpretation and the study of subjectivity in the historical record – could be extracted in some useful and even constructivist form from the data underlying a sketched timeline. Thanks to the contributions of software developer Jim Allman, every timeline drawn in the PlaySpace and, just as crucially, every user-declared “temporal model” – consisting of one or more timelines resting individually or in clusters on named, transparent layers – could be expressed as well-formed XML and exported or shared by its creator.

It was our intention (although the project ended before this phase could be fully developed and tested) that users might analyze and transform these XML representations into formal, temporal markup schemata through which their texts of interest could be newly encoded. Documents marked up to the specifications of – for instance – a user-

customized Temporal Modelling extension to TEI (Text Encoding Initiative) standards would be at once reasonably interoperable and able to be represented and processed experimentally according to an “inner logic” derived from their editor’s defamiliarizing visual and (utterly familiar) hermeneutic engagement in the PlaySpace. I further projected creation of a DisplaySpace that might complete the hermeneutic circle by allowing import and presentation of Temporal Modelling-style visualizations of documents so encoded. But visualization of these marked-up documents as timelines in the DisplaySpace was not imagined to be the final “product” of a Temporal Modelling session. Instead, we hoped that users would reflect on the aptness of the data model they had created and, perhaps provoked by our mechanical, visual extrapolation of it across the marked dataset, return to a PlaySpace mode for further graphical (and therefore structural) refinement. The notion of “aesthetic provocation” such a system might engender – the system’s provocation to its user to tinker further, re-visualize and reinterpret – returned to our SpecLab research group later as a defining interface design principle for the Ivanhoe Game.³⁹

The Ivanhoe Game – an environment for ludic, persona-centered pedagogy and experimentation in literary studies and other textually-oriented disciplines – is another artifact of conversations that happened in our SpecLab research group at the University of Virginia between the years 1999 and 2004. As it has been thoroughly treated elsewhere, I will limit my discussion here to the later phases of interface design for the project, when, in collaboration with Nick Laiacona and other programmers at the NINES project, Jerome McGann and I worked through problems of spatial arrangement and aesthetic provocation.⁴⁰ Because gameplay in Ivanhoe was essentially roleplay, we

searched for ways to foreground subjectivity and perspective, while still providing a common view of a “discourse field” that could be collaboratively constructed as players introduced new documents and altered the texts already in play. We created an “attentional” Ivanhoe interface – a primary visualization of the game’s discourse field, in which players were pictured as migrating marbles in a circular area around which documents were represented as arcs of varying length. The positions of player icons and the sizes and locations of document arcs were continuously evaluated and re-generated as a function of gameplay – specifically, as visualizations of the quality and degree of attention players were paying to certain texts in the discourse field. Players who collaborated in editing certain texts (and, perhaps, in ignoring others) would be seen to aggregate in proximity to their objects of interest. Texts that received a greater degree of attention during gameplay grew to occupy a larger ratio of our 360-degree visualization. And color-coded rays, representing the different sorts of emendation possible in Ivanhoe, extended from player icons to the texts in the ring, serving to highlight the actions of gameplay, their sources in individual player interventions, and their overall impact on the field of discourse. A timeline and set of animation controls allowed players to reel back collaborative changes, or play them through as a fast-paced visualization from start to finish.

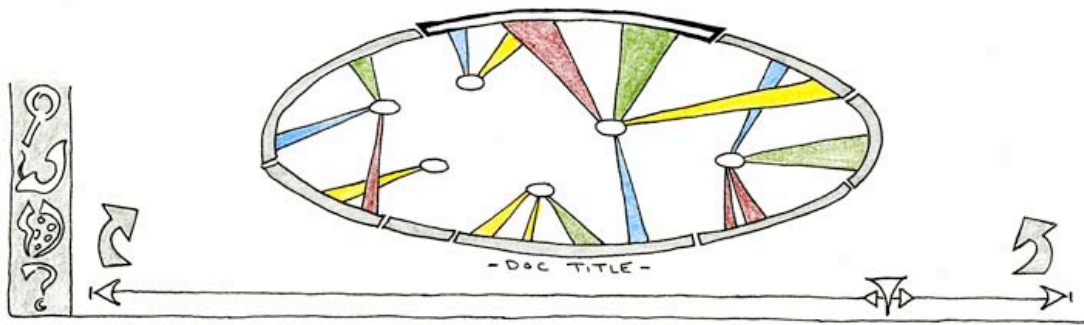


Figure 10. 2004 design sketch by Bethany Nowviskie, Ivanhoe Game.

Design of the Ivanhoe Game predated widespread use of code versioning software in the digital humanities, and certainly came before the emergence of spatial visualizations of change to a code-base over time, as seen in Michael Ogawa's code_swarm software.⁴¹ As students of bibliography, we therefore grappled with new ways to allow players both to generate and to inhabit a landscape of textual variation that is more typically pictured in traditional stemmatics – graphs depicting the genealogy of a particular documentary instantiation of a work of literature by demonstrating its descent from other versions.⁴² It was our particular concern not only to define the discourse field spatially as regions of text-oriented activity, but also to provide a visualization that might serve as an aesthetic provocation to players. Where the Ivanhoe Game pictures you, might vex you. Perhaps you have a different mental model for the spatial relations among players and texts in the game you believe you are playing – or perhaps the crystallization of your actions into an absolute positional grid (recalculated though it may be on a move-by-move basis) will provoke you to resist, and play the game differently, in order to generate a different visualization. To what degree was Frances Henshaw playing

an Ivanhoe Game with her source texts and maps? And how would we begin to find out, except by playing along?

Both of the tools I have described are oblique to Henshaw's exercise, but suggest an orientation toward image-based procedural activity in the interpretive digital humanities that we could extend to the realm of geospatial tools and methods. Temporal Modelling speaks to knowledge creation through visualization and especially through iterative refinement of sketches. Ivanhoe's spaces are not *geospatial* in terms of geographic referents, but literary scholars may ultimately be as interested in dynamic "discourse fields" that both construct internal spatial relations and reflect on their interpenetration with alternate coordinate systems – imaginative and real. We are, at the same time, concerned with the material forms our texts take, and the ways in which these can be "mapped," both internally, as designed objects, and – in their production and reception histories – in relation to each other. What do tools designed for real-world geospatial representation and analysis have to say to us? Are the cartographic procedures of our own day instructive?

And what's next? We should push the evolution, not just of tools with which we might approach space and place, but also of our practices and attitudes toward methodological (as opposed to strictly theoretical) work. We must also share better, and not just within narrow disciplinary silos. This will require adequate resourcing of map and data repositories built with the guidance of humanities scholars, examination of the sustainability of humanities publications and the geospatial datasets they build on, and new engagement of professional societies and digital and traditional humanities centers with methodological training.⁴³ A growing emphasis on the public humanities –

especially as locative technologies become more ubiquitous and empowering of larger communities – can help fuel this activity, but ultimately novel modes and practices are only taken up in scholarly communication insofar as they offer disruptive models for producing insight, and provocations that change the conversation.⁴⁴ To that extent – and even as we work to normalize and better support our publishing procedures for the spatial humanities – the creative application of geospatial tools and approaches to problems in our disciplines may remain an area well-suited to evocative one-off projects. (The one-off has in fact has characterized our early engagement with GIS).

An especial challenge for GIS may then be – at this particular juncture in the digital evolution of humanities scholarship – to promote excellent work that is at once idiosyncratic (befitting our varied objects of interest and disparate research agendas) and yet mutually intelligible, building on common, open datasets, standards, delivery protocols and tools. Scholarly prose has proven a remarkably flexible, fungible, and sustainable medium for our centuries-long conversation about human culture. We are now, however, presented with novel opportunities for the study of spatial relations and place-based humanities – most of which involve appropriation of methods and tools designed for other purposes. Where can we most usefully intervene – both in the practicalities of tool and project development, and in the spirit and methodological course of our disciplines – to make a real contribution to humanities interpretation through the use of spatial and geospatial technology? To whom will we look for inventions of the map?

Bethany Nowviskie
University of Virginia Library

Notes

¹ Library of David Rumsey, Pub List No. 2501.000; available: <http://bit.ly/dmbgHL>

² See: Osborne, Georgia L. "Brief biographies of the figurines on display in the Illinois state historical library." Springfield, Illinois: 1932; p. 54. – Morse, Abner. "A Genealogical Register of the Descendants of Several Ancient Puritans." Vol. III.; H.W. Dutton Press, Boston, 1861. – Post, T. A. "Truman Marcellus Post, D.D.: a biography, personal and literary." Congregational Sunday-School and Publishing Society: Boston and Chicago, 1891. – Smith, H. P. (ed.) "History of Addison County, Vermont." D. Mason & Co., Publishers, 1886.

³ See Brückner, Martin. *The Geographic Revolution in Early America: Maps, Literacy, and National Identity*. University of North Carolina Press: 2006; and Schulten, Susan. (2007) "Emma Willard and the graphic foundations of American history," *Journal of Historical Geography* 33, 542-564.

⁴ See: Pittser, Sharan E. (1999) "Early Women Geography Educators, 1783-1932," *Journal of Geography*, 98:6, 302-307.

⁵ I am presently working with Matthew Knutzen, Assistant Chief of the Maps Division at the New York Public Library, to determine whether further examples of such exercise books may have survived.

⁶ Brückner, pp. 114-115, and see his Figure 31 for an example.

⁷ Emma Willard to "Miss Foster," 5 November 1848. Reprinted in Lord's *Life of Emma Willard*. New York: 1873; page 228. See Schulten on the short-lived recognition of Willard's contribution.

⁸ See: UVA's Scholars' Lab: <http://lib.virginia.edu/scholarslab/> – SCI7 on spatial tools and methods: <http://www.uvasci.org/archive/spatial-technologies-and-methodologies-2009/> – the Institute for Enabling Geospatial Scholarship:

<http://lib.virginia.edu/scholarslab/geospatial/> – and Neatline: <http://neatline.org/>

⁹ “Vernacular” was a term adopted by participants in the 7th annual Scholarly Communication Institute to address commercial, cloud-based, and open-source “neo-geo” tools and interfaces based on mobile technologies, GPS, virtual globes, and Web-based slippy maps. See the final report and executive summary of the Institute for further discussion: <http://www.uvasci.org/archive/spatial-technologies-and-methodologies-2009/summary/>

¹⁰ Jessop, Martyn. “The Inhibition of Geographical Information in Digital Humanities Scholarship.” *Literary and Linguistic Computing*, April 2008 (vol. 23: 39-50).

¹¹ See also Martyn Jessop on “Digital Visualization as a Scholarly Activity” in *Literary and Linguistic Computing*, September 2008; 23: 281 - 293.

¹² Brueckner, 137-9; and Judith Tyner, “The World in Silk: Embroidered Globes of Westtown School,” *The Map Collector*, #74, Spring 1996, pp. 11-14. (Thanks to Julie Sweetkind-Singer for this reference.)

¹³ See Willson, Marcius. "A Critical Review of American Common School Histories: As Embraced in a Report submitted to the New Jersey Society of Teachers and Friends of Education..." *Biblical Repository*: 517-539 (July 1845) – Willard, Emma. *An Appeal to the Public, Especially Those concerned in Education, Against Wrong and Injury Done by Marcius Willson*; New York: A. S. Barnes, 1847 – and *Answer to Marcius Willson's Second Reply: or Second Appeal to the Public*. New York: A. S. Barnes, 1847.

¹⁴ See Schulten, 556-62 and Figures 3-7. A further example of Willard's visualization is reproduced in Rosenberg and Grafton, *Cartographies of Time: A History of the Timeline*. Princeton Architectural Press, 2010. (Figure 33, page 201).

¹⁵ I have made myself tiresome by publicly noodling over the suitability of spatial tools and methods to research on documents like this at: the "Digital Dialogues" lecture series at the Maryland Institute for Technology in the Humanities; Digital Humanities '09 in College Park; the 7th annual Scholarly Communication Institute in Charlottesville, Virginia; and will continue to do so at the upcoming Digital Humanities '10 conference in London.

¹⁶ Gregory, Ian and Paul S. Ell. *Historical GIS: Technologies, Methodologies, and Scholarship*. Cambridge University Press, 2007.

¹⁷ This work is published, along with other excellent case studies, in Anne Knowles's edited volume, *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship*. ESRI Press, 2008.

¹⁸ I am grateful to David Rumsey for introducing me to the physical document in his personal library, and for having additional pages scanned and mounted online at my request. With this essay, I finally discharge my duty to "do something with them" in return!

¹⁹ Jedediah Hotchkiss to Nellie Hotchkiss, 17 December 1862, Hotchkiss Family Papers, Albert and Shirley Small Special Collections Library, University of Virginia. This letter, along with small subset of Hotchkiss maps and correspondence, forms a test case for the Neatline project on which I am collaborating with Adam Soroka and other colleagues at the Scholars' Lab.

²⁰ Records – including obscure, local historical society tracts – digitized through Google Books and the Internet Archive quickly confirmed these readings and led to a wealth of biographical information including, among the collections of the Illinois State Historical Library, a figurine of Henshaw as one of Illinois’ prominent women, prepared by sculptor Mina Schmidt for the World’s Columbian Exposition in 1929.

²¹ Private conversation, October 2009. In collaboration with the Scholars’ Lab and IATH at the University of Virginia, Edelson is undertaking an NEH- and ACLS-supported project to address this issue: the Cartography of American Colonization Database.

²² Links related to web-based image viewers: Virtual Lightbox:

<http://mith.umd.edu/lightbox/> – for the Blake viewer, see the William Blake Archive:

<http://blakearchive.org/> – Cooliris (an example of the “wall of images” approach):

<http://www.cooliris.com/> – GIS at Redlands: <http://www.spatial.redlands.edu/> – and

single-image lightbox effects: http://en.wikipedia.org/wiki/Lightbox_%28JavaScript%29

²³ Anne Knowles’ edited volumes are a notable exception, and we can look forward to a forthcoming Indiana University Press collection on The Spatial Humanities (edited by David Bodenhammer, John Corrigan, and Trevor Harris). The National Endowment for the Humanities has also recently funded an historical GIS clearinghouse to be developed by the Association of American Geographers as well as a spatial humanities community website to be developed by UVA’s Scholars’ Lab (including a project showcase, Q&A forum, and “Step by Step” how-tos.)

²⁴ Pleiades: <http://pleiades.stoa.org/> – the Tibetan and Himalayan Library –

<http://thlib.org/> – Harvard AfricaMap: <http://africamap.harvard.edu/> – and Hypercities:

<http://hypercities.com/>

²⁵ See outcomes from a recent NiCHE Workshop on Application Programming Interfaces for the Digital Humanities: <http://niche-canada.org/digital-infrastructure/apiworkshop>

²⁶ Henshaw's text for this section of the book seems to be a match to an 1802 edition of Morse's *Geography Made Easy: Being an Abridgement of the American Universal Geography...*, printed and published by Thomas and Andrews in Boston. This is the 8th, author-corrected edition. Morse's book went through 20 editions between 1784 and 1819, and Henshaw's source document certainly pre-dates the 12th edition, which saw substantive revision.

²⁷ See records for List No. 2501... at <http://davidrumsey.com/> A misconstrued date for the Henshaw book (1828 for 1823) explains, in part, the puzzlement expressed in Rumsey's metadata about her use of such noticeably out-of-date sources.

²⁸ See note 26 on the textual history of Henshaw's copy-exercises. Google Book scans of public domain texts were highly effective for my research despite recognized limitations of poor OCR and a limited API. The Juxta textual collation system is available at <http://juxtasoftware.org/> – and see note 42.

²⁹ Unlike Juxta, which operates on transcribed text, the Sapheos project takes page images as its basic unit for collation. This work has been funded by a 2009 NEH start-up grant to project director Randall Cream: <http://sapheos.org/>

³⁰ On cartographic decision-making using modern tools and methods, see John Krygier and Dennis Wood, *Making maps: a visual guide to map design for GIS*. Guilford Press, 2005.

³¹ For early work in this area, see Renear, Mylonas, and Durand, “Refining our Notion of What Text Really Is: The Problem of Overlapping Hierarchies,” available:

<http://www.stg.brown.edu/resources/stg/monographs/ohco.html> A capsule summary of the problem may be found in an abstract for a 1999 debate between Allen Renear and Jerome McGann at ACH/ALLC in Charlottesville, Virginia:

<http://www2.iath.virginia.edu/ach-allc.99/proceedings/hockey-renear2.html> and for an extended treatment of the issue, see Jerome McGann. *Radiant Textuality: Literature After the World Wild Web*. Palgrave MacMillan: 2004.

³² The earliest absolutely-dated American log cabin quilt stems from the pattern’s heyday, just after the Civil War. However, textual evidence from 19th-century America and much earlier, dated quilts from Europe indicate that the pattern would have been part of the domestic vocabulary of Henshaw’s day. Textile historian Barbara Brackman discusses the history of the log cabin quilt pattern and, interestingly, challenges a popular assumption that these quilts had map-like qualities (articulated, for example, by Jacqueline Tobin and Raymond Dobard in *Hidden in Plain View: the secret story of quilts and the Underground Railroad*). See Brackman’s *Quilts from the Civil War: nine projects, historic notes, diary entries*, C&T Publishing, 2009.

³³ This is a subject I took up in an unpublished 2004 dissertation from the University of Virginia: *Speculative Computing: Instruments for Interpretive Scholarship*, a key chapter of which (“Ludic Algorithms,” with a central case study on Ramon Llull, who figures the user of his mechanical, constraints-based systems for generating hermeneutic prompts as an *artista*) is being revised for publication in *Pastplay*, a volume of essays stemming

from a 2010 symposium on “Playful Technology in History:”

<http://playingwithhistory.com/>.

³⁴ *London Review of Books*, “At the End of My Pencil,” 8 October 2009. I am grateful to Willard McCarty for this reference.

³⁵ Drucker, Johanna. *SpecLab: Digital Aesthetics and Projects in Speculative Computing*. Chicago UP: 2009, page 65. And see my “Temporal Modelling” capsule summary in Drucker’s “Speculative Computing: Aesthetic Provocations in Humanities Computing,” *A Companion to Digital Humanities*. Oxford: Blackwell Publishers, 2004.

³⁶ The original Temporal Modelling project was the work of a four-person team: Johanna Drucker was PI of the Intel Corporation grant that funded our work. I served as design architect and project manager, Jim Allman led our programming and data management efforts, and CalArts student Petra Michel contributed to the design of timeline elements to express concepts like mood, influence, and subjective point-of-view.

³⁷ *London Review of Books*, “At the End of My Pencil,” 8 October 2009.

³⁸ A record of the original Temporal Modelling Project may be found at <http://www.iath.virginia.edu/time/>. A newly-constituted Temporal Modelling Research group was funded by SSHRC under the direction of Stan Ruecker in early 2010. Partners in this effort include Ruecker, Geoffrey Rockwell, Susan Brown, Megan Meredith-Lobay, Johanna Drucker, and Bethany Nowviskie. The team will examine a set of case studies in “timelines for conflicting witnesses,” supplied by Rockwell, Meredith-Lobay, and Nowviskie – a first presentation of which was made at the 2010 conference of the Canadian Historical Society in Montreal.

³⁹ Several members of the SpecLab group treated the Ivanhoe Game in a special issue of Text Technology (12:2, 2003): available at

<http://texttechnology.mcmaster.ca/archives.html> This issue includes my own essay, “Subjectivity in the Ivanhoe Game: Visual and Computational Strategies.”

⁴⁰ The game itself, in its latest instantiation, can be found at <http://ivanhoegame.org/>

Working documents, designs, and prototypes have long been preserved at

<http://speculativecomputing.org/> but at the time of this writing are unavailable.

⁴¹ <http://vis.cs.ucdavis.edu/~ogawa/codeswarm/>

⁴² Our own response to the opportunities of visualization for more traditional forms of textual criticism later came in the design of Juxta, a piece of collation software that displays textual variation across a corpus of texts as a “heatmap” of degrees of difference:

<http://jxtasoftware.org/>

⁴³ These are issues being taken up by the Scholars’ Lab at the University of Virginia Library, in the context of its Institute for Enabling Geospatial Scholarship:

<http://lib.virginia.edu/scholarslab/geospatial/> Look also, by late 2010, for a release of an NEH-funded Spatial Humanities informational portal, showcase, and community site, at <http://spatial.scholarslab.org/>

⁴⁴ I offer sincere thanks to the steering committee of the Scholarly Communication Institute for discussion of these issues.