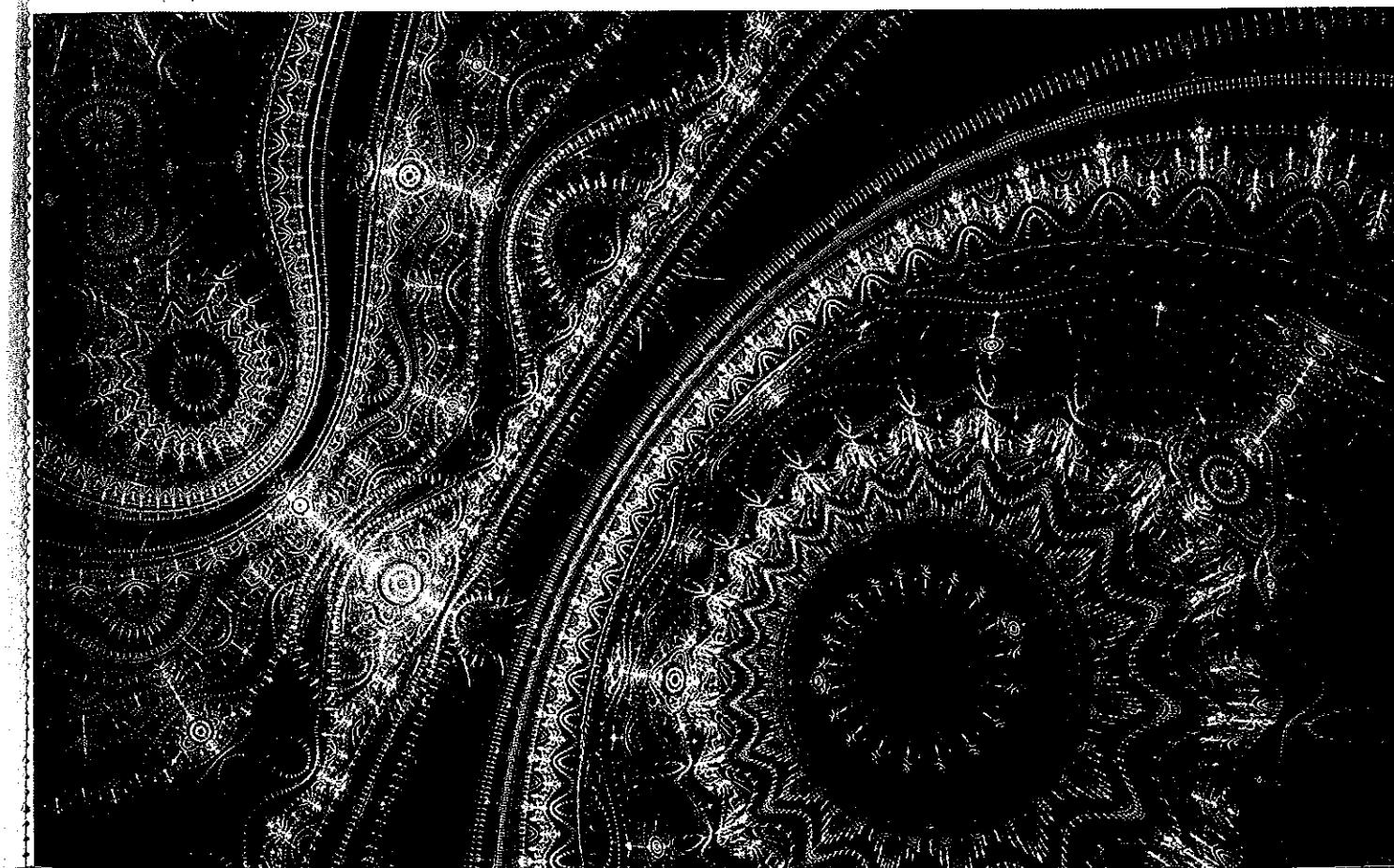


Abstract
Machine

Humanities GIS

Charles B. Travis



Cover image of abstract design of steampunk watch, digital fractal artwork, courtesy of Keila Neokow and Eli Vokounova/Shutterstock.com.

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Taylor & Francis Group, www.tandfonline.com, "Transcending the cube: Translating GIScience time and space perspectives in a humanities GIS" by Charles Travis, *International Journal of Geographical Information Science (IJGIS)*, vol. 28:5, p. 1149–1164, 2014; and from "From the ruins of time and space" by Charles Travis, *City*, vol. 17, issue no. 2, p. 209–233, 2013, article DOI: 10.1080/13604813.2012.754191.

Edinburgh University Press, <http://www.euppublishing.com/journal/IJHAC>, "Abstract Machine—Geographical Information Systems (GIS) for literary and cultural studies: 'Mapping Kavanagh'" by Charles Travis, *International Journal of Humanities and Arts Computing*, vol. 4, p. 17–37, available online October 2010, DOI 10.3366/ijhac.2011.0005, ISSN 1753–8548.

To my son, Senan James: like this book, you were a long time coming but well worth the wait!

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Preface: Abstract Machine

Growing up, I was captivated by maps that accompanied pieces of fiction and the ways in which writers depicted actual and imagined places. In 2006, I was awarded a PhD for a thesis titled *Lifeworlds: Literary Geographies in 1930s Ireland*. My research examined how writers represented landscape, identity, and sense of place in Ireland during the early twentieth century. “Human geographers” as we conceive of them today did not exist during that period, so I employed writers as their proxies, informed by Ian G. Cook’s observation that geographers and:

the novelist have much in common. Both seek to portray the activities of people within the context of a specific milieu, infusing their descriptions of people and places with a sensitivity born of a rich and varied experience of life and society. Both seek to engender in their audience a deep awareness and empathy concerning others and their *lebenswelt*.¹

My work was not a literary study per-se because it focused on phenomenology and the experience, perception, and representation of actual landscapes as captured through the prism of a writer’s imagination. However, I became aware of the power of writing techniques and the strong relationship between literature, history, and place. I was also exposed to critical theory, particularly Mikhail Bakhtin’s idea of the *chronotope*, a time-space motif that acts as a historical and geographical knot to tie a piece of literature’s narrative strands together. At the time, I was teaching geographical information systems (GIS) in a graduate-level environmental science course and started to think about its convergences with literary approaches to place, in light of Gilles Deleuze and Félix Guattari’s claim that “writing has nothing to do with signifying. It has to do with surveying, mapping, even realms that are yet to come.”² Deleuze and Guattari also propose, “when one writes, the only question is which other machine the literary machine can be plugged into . . . in order to work.”³ In the context of the digital humanities, I thought that GIS might be a type of “machine” with which to do this. The creation and genealogy of GIS also seemed to conform to Deleuze and Guattari’s definition of other human-technological interfaces comprising the forms and functions of an abstract machine:

The double deterritorialization of the voice and the instrument is marked by a Wagner abstract machine, a Webern abstract machine, etc. In physics and mathematics, we may speak of a Riemann abstract machine and in algebra of a Galois abstract machine.⁴

Initially, the minimalist alliteration of point, polyline, and polygon-layer digital-mapping techniques employed in the abstract machine of a GIS did not captivate me. However, I soon

began to consider whether Bakhtin's time-space nodes, and the narrative strands they tie together in a piece of literature, could be "plugged" into such an abstract machine and then correlated with latitude and longitude coordinates to map the relationships between actual and imaginary locations in a writer's depiction of place. Stuart Aitken and James Craine have observed that GIS acts not only as a technology of image making and communication but also as one of information transfer and knowledge production. They note that GIS comprises a chain of practices and processes through which users can gather geographical information and from it construct imaginative geographies.⁵ The prospect of using GIS for digital mapping, spatial modeling, and storytelling in the humanities thus became even more intriguing to me.

And this is where I mix my metaphors.

For years, I played a Fender Stratocaster, an electric guitar that revolutionized the blues, jazz, country music, and rock and roll. Scoring and recording music is by its nature a mathematical and creative process, and innovations in sound engineering, which set musical inspiration to flight, could not have been made possible without discoveries in the fields of physics and electronics.

Musical artists such as Philip Glass and Peter Gabriel and bands such as Pink Floyd and U2 also intrigued me because they artistically engaged technology to compose their landscapes of sound. I was particularly fascinated by David Bowie's collaboration with Brian Eno, which produced the 1977 album *Heroes*. Bowie pointed out that the synthesizers used in the album had been designed by engineers, not musicians. The pair discarded their synthesizer manuals and simply played and experimented with the machines to create the sonic textures that shape their distinct soundscapes. This struck me as highly innovative in its simplicity and in turn influenced my own playful engagements and thoughts of employing GIS as a technology. Consequently, I follow a similarly idiosyncratic approach to historical, cultural, and literary GIS scholarship, in which I consult Esri tutorial manuals and then "critically play" with the software's digital suite of tools while keeping the tropes of the humanities firmly in mind.

One way to consider this method is to think about how music is charted and performed. Melodies and rhythms are schematically diagrammed on the staves according to mathematical principles. However, when translated by a musician, these representations create sonic vibrations in space, which cross the threshold from the quantitative to the qualitative, creating an entire liminal space of performance and reception.

In many ways, GIS has become my Fender Stratocaster.

I believe that GIS scholarship in the arts and humanities will proliferate by conceiving and developing its own unique languages, tools, and methodologies. We can therefore reconceptualize the operations of GIS as a creative suite in which to play and perform various digital-mapmaking and spatial-modeling techniques. In Esri's ArcGIS software, the ArcMap application constitutes a digital canvas upon which to plot abstracted layers of points, polylines, and polygons. The ArcCatalog application comprises a library platform from which the digital layers to create a map can be produced, borrowed, and returned. The animated mapping features of the ArcScene and ArcGlobe environments transform the possibilities for representing the dynamic relation between space and time in a cinematic manner, echoing Walter Benjamin's observation, in 1936, of the ability of film "to assure us of an immense and unexpected field of action . . . with the close-up, space expands; with slow motion, movement is extended."⁶ Indeed, "time-space GIS movies" draw on the emotional power of moving images to tell visualized stories because cinematic techniques

offer a kinetic visual experience more characteristic with the tropes of modernity to transform the possibilities for representing space in GIS.⁷

As a visualization tool most strongly associated with the discipline of geography (translated from the Greek for "earth writing"), we can conceptualize a humanities GIS model as an electronic stylus and digital cuneiform to inscribe spatial language and symbols. Such a model resurrects the practice of *geographia* from its ancient Greek and Roman roots, when the discipline constituted a literary genre more so than a branch of physical science.⁸ When I teach GIS, I tell my students that to become proficient, they must practice their craft, just as if they were learning to play a piano, a saxophone, or a Fender Stratocaster. By approaching the "science" of GIS as an "art" form, humanities students can creatively play and experiment with its toolkit to translate its approaches for their own research and fields of study. This book offers a few creative examples of humanities GIS models, but the budding geospatial John Coltranes, Pablo Picassos, and Georgia O'Keeffes are out there somewhere. I hope this book provides them with some inspiration.

Sources

- 1 I. G. Cook, "Consciousness and the Novel: Fact or Fiction in the Works of D. H. Lawrence," in *Humanistic Geography and Literature: Essays on the Experience of Place*, ed. D. C. Pocock (New Jersey: Barnes & Noble Books, 1981), 66.
- 2 G. Deleuze and F. Guattari, *A Thousand Plateaus*, trans. B. Massumi (London: Athlone, 1988), 4–5.
- 3 Ibid., 4.
- 4 Ibid., 141–42.
- 5 S. Aitken and J. Craine, "Affective Geographies and GIScience," *Qualitative GIS: A Mixed Methods Approach*, ed. M. Cope and S. Elwood (Thousand Oaks: Sage, 2009), 141.
- 6 W. Benjamin, *Illuminations* (London: Fontana Press, 1992), 229.
- 7 M.-P. Kwan, "Affecting Geospatial Technologies: Toward a Feminist Politics of Emotion," *The Professional Geographer*, 59, no. 1 (2007): 22–34; D. Cosgrove, "Maps, Mapping, Modernity: Art and Cartography in the Twentieth Century," *Imagi Mundi*, 57, no. 1 (2005): 35–54.
- 8 J. S. Romm, *The Edges of the Earth in Ancient Thought: Geography, Exploration, and Fiction* (Princeton: Princeton University Press, 1992), 3–4.

Sources

- 1 P. Booker and A. Thacker, *Geographies of Modernism: Literatures, Cultures, Spaces* (London and New York: Routledge, 2005), 1.
- 2 D. J. Staley, "Finding Narratives of Time and Space," in *Understanding Place: GIS and Mapping across the Curriculum*, eds. D. S. Sinton and J. J. Lund (Redlands: Esri Press, 2007), 36.
- 3 M. de Certeau, *The Practice of Everyday Life*, (Berkeley: University of California Press, 1988), 121.
- 4 T. M. Barnes, J. Corrigan, and D. J. Bodenhamer, eds., *The Spatial Humanities: GIS and the Future of Humanities Scholarship* (Bloomington and Indianapolis: Indiana University Press, 2010), 174.
- 5 P. Merriman et al., "Space and Spatiality in Theory," *Dialogues in Human Geography*, 2, no. 1 (2012): 19; for a further discussion of "qualculativeness," please see N. Thrift, "Movement-Space: The Changing Domain of Thinking Resulting from the Development of New Kinds of Spatial Awareness," *Economy and Society*, 33, no. 4 (2004): 582–604.
- 6 J. E. Dobson, Reply to comments on "Automated Geography," in *The Professional Geographer*, 35 (1983): 351.
- 7 D. Haraway, *Simians, Cyborgs and Women: The Reinvention of Nature*, (London and New York: Routledge, 1991), 151.
- 8 Ibid., 181.
- 9 Deleuze and Guattari, *A Thousand Plateaus*, 23.
- 10 Ibid., 142.
- 11 Aitken and Craine, "Affective Geographies and GIScience," 141.
- 12 F. Moretti, *Atlas of the European Novel 1800–1900* (London: Verso, 1998); Moretti, *Graphs, Maps, Trees: Abstract Models for a Literary Theory* (London: Verso, 2005); B. Piatti, *Die Geographie der Literatur: Schauplätze, Handlungsräume, Raumphantasien* (Göttingen: Wallstein Verlag, 2008); (Ein Literarischer Atlas Europas [Literary Atlas of Europe][<http://www.literaturatlas.eu/en/>]).
- 13 B. Westphal, *Geocriticism: Real and Fictional Space*, trans. R. T. Tally, Jr. (New York: Palgrave MacMillan, 2011); R. T. Tally, Jr., *Geocritical Explorations: Space, Place, and Mapping in Literary and Cultural Studies* (New York: Palgrave MacMillan, 2011).
- 14 *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship*, eds. A. K. Knowles and A. Hiller (Redlands, CA: Esri Press, 2008); *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, eds. D. J. Bodenhamer, J. Corrigan, and T. Harris (Bloomington: Indiana University Press, 2010); and *GeoHumanities: Art, History, Text at the Edge of Place*, ed. M. Dear et al. (New York: Routledge, 2011).
- 15 Staley, "Finding Narratives of Time and Space," 45.
- 16 Ibid.
- 17 M. Sample, "Notes towards a Deformed Humanities," *Sample Reality* (blog), May 2, 2012, <http://www.samplereality.com/2012/05/02/notes-towards-a-deformed-humanities/>.
- 18 Ibid.
- 19 Ibid.
- 20 J. McGann and L. Samuels, "Deformance and Interpretation," *New Literary History*, 30, no. 1, "Poetry & Poetics" (Winter, 1999): 25–56.
- 21 A. Mactavish and G. Rockwell, "Multimedia Education in the Arts and Humanities," *Mind Technologies: Humanities Computing and the Canadian Academic Community*, eds. R. Siemens and D. Moorman (Calgary: University of Calgary Press, 2006).
- 22 A. Liu, "Where Is Cultural Criticism in the Digital Humanities?" in *Debates in the Digital Humanities*, ed. M. Gold (Minneapolis: University of Minnesota Press, 2012), <http://dhdebates.gc.cuny.edu/debates/text/20>.
- 23 L. Manovich, "How to Follow Global Digital Cultures, or Cultural Analytics for Beginners," in *Deep Search: The Politics of Search beyond Google*, eds. F. Stalder and K. Becker (Piscataway, NJ: Transaction Publishers 2009).
- 24 C. Travis, *Lifeworlds: Literary Geographies in 1930s Ireland* (Dublin: Trinity College Dublin, 2006).
- 25 Ezra Pound, letter to Homer Pound dated April 20, 1921, in *Pound/Joyce: The Letters of Ezra Pound to James Joyce, with Pound's Essay on Joyce*, ed. F. Read, (New York: New Directions, 1967), 189.

Chapter 2

Toward the spatial turn

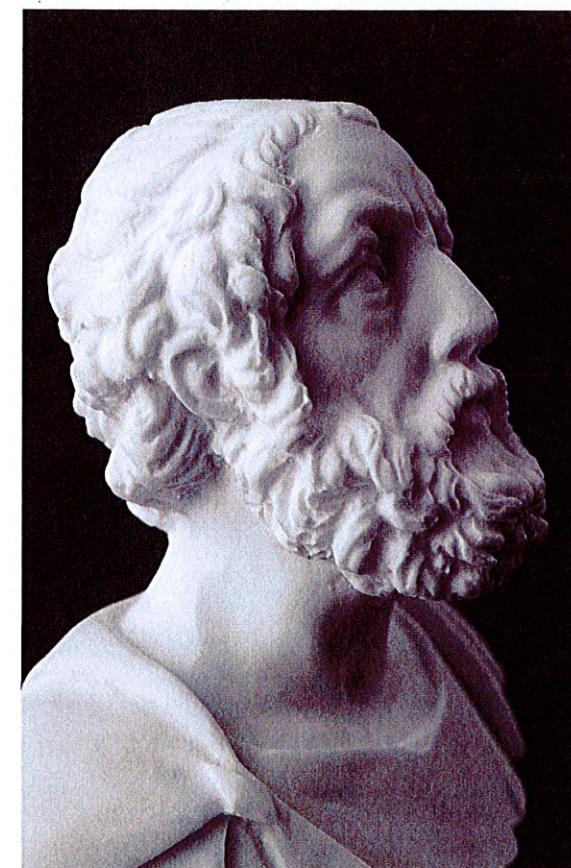


Figure 2.1 The geographer's science and storyteller's art (Homer). Courtesy of Vasileios Karafillidis /Shutterstock.com.

A brief history of Western geographical thought

In *Geographies of Modernism* (2005), Andrew Thacker and Peter Brooker note the recent, strong interest in the geographical and spatial dimensions that shape and are represented in literary and cultural texts.¹ Arguably, the roots of Western geographical thought and cartographical practice spring from the entwined branches of literary, artistic, and scientific pursuits; etymologically speaking, the word *geography* derives from the Greek word for “earth writing” (*geo* = “earth,” *graphein* = “writing”). With imagination, humanities scholars can engage GIS as a prosthetic device to survey the *terrae incognitae* of historical, aesthetic, and cultural “textual spaces.” A brief history of Western geographical thought and cartographical practice reveals few precedents for reconciling these spaces and their diverse artistic, narrative, and scientific genealogies in a humanities GIS model.

Herodotus (484–25 BC) and Strabo (63 BC–ca. 24 AD) sifted through a vast storehouse of travelers’ tales, separating fact from fiction and retelling the stories they thought were credible enough to claim a reader’s attention.² In doing so, they contributed to defining one branch of geography as a narrative and idiographic discipline anchored in ethics and politics. In contrast, Eratosthenes (276–195 BC) and Ptolemy (90–168 AD) employed mathematics to calculate the spherical nature of the earth and develop early map projections that helped to establish a branch of geography as a type of “geometry with names,”³ foreshadowing modern attempts to establish nomothetic practices in cartography and geography. Initially, “the geographer’s science and storyteller’s art could not be fully detached from each other.”⁴ Soon enough, a clash developed between them:

An academic controversy was waged over the reliability of geographical data in Homer’s *Odyssey*. Strabo, who believed the *Odyssey* to be authentic and reliable, in a long and controversial passage leveled criticism against Eratosthenes for holding that Homer should be read as a poet and not as a scientific authority.⁵

Tensions and debates between the discipline’s positivistic and poetic strands shaped the evolution of Western geographical thought and cartographical practice. A humanities GIS model may provide common ground.

Michel de Certeau (1925–86) observed that medieval and early modern mapmakers narrated spatial stories and histories by mapping religious pilgrimages and crusades, which they often experienced personally. They embellished their maps with the traces of footprints and alongside them illustrated the successive events that took place in the course of their journeys, such as meals, battles, mountains, and river crossings. In this regard, mapmakers acted as tour guides, visually interpreting their experiences and the plots of navigators with traditional geographical knowledge (such as Ptolemy’s *Geography*) into representations conveying the reason and manner for which the maps were created (figure 2.2).

However, de Certeau notes, “between the fifteenth and seventeenth centuries, the map became more autonomous”⁶ and eliminated such pictorial embellishments. Transformed by Euclidian and descriptive geometry, maps began to constitute an ensemble of “abstract spaces,” in which a unitary sense of projection subsumed the mapmaker’s experience and traditional



Figure 2.2 The North Sea—medieval spatial stories (map fragment, 1572). Courtesy of Sergey Mikhaylov/Shutterstock.com.

geographical knowledge within its theatrical frame. Now, maps collate “on the same plane heterogeneous places, some received from a tradition and others produced by observation.”⁷ Over time, by erasing the itinerary and idiosyncratic perspective of the human tour guides who created it, the map began to “colonize space,” producing a totalizing stage on which elements of diverse origin were “brought together to form the tableau of a ‘state’ of geographical knowledge.”⁸

In short, between the fifteenth and seventeenth centuries, abstract projections gradually effaced the idiosyncratic perspective and experience of the mapmaker.

During this period, John Pickles notes, two scopic regimes dominated the arts and sciences in Europe. One developed through the use of Cartesian perspectivalism, which allowed 3D spaces and linear perspective to be depicted together in two dimensions on a flat surface. This regime fixed visual representation within a coordinated grid.⁹ In 1425, the Italian artist Filippo Brunelleschi performed a “feat of magic” in a cathedral piazza in Florence when he demonstrated the optical illusion created by the vanishing point in a painting. His innovative technique had “irreversible implications for the entire future of western art.”¹⁰ The other scopic regime, associated with the descriptive school in seventeenth-century Dutch art, sought to develop techniques for representing a phenomenological view of the world in two dimensions.¹¹ This fostered a “mapping impulse” in both Dutch painting and cartography concerned with representing the world in an intelligible and accessible manner for the public good.¹²

Perspectivalism offered mapmakers a homogeneous space regulated by a grid-like network of coordinates that created theatrical “scenographic” representations. According to Pickles, particular forms of parametric space, geometry, and scale anchored this modern cartographic gaze and subjected cartography to a controlling epistemological perspective that miniaturized and universalized the world’s enormous complexities for discrete purposes.¹³ In distinction to cartography, however, geography remained a wide field of knowledge until and during the Enlightenment, R. J. Mayhew asserts, rather than a closed and controlling discipline. Because geography and literature acted as more permeable categories in the eighteenth century, many geographers continued to pursue interests comparable to that which we now consider literary.¹⁴ This flexibility set a precedent for scholars working to conceptualize a GIS model that creatively synthesized approaches in the humanities and sciences. However, as Brian Harley observes, Western cartographical practices since the seventeenth century have propagated a standardized scientific model of knowledge that produces a “correct” relational model of the terrain being mapped.¹⁵ Consequently, cartography became a scientific, empirically based profession that embraced the practices of classification, quantification, and instrumentation.

Over the next two centuries, governments, states, and nations established institutions to conduct surveys and produce maps and topographical records of the territories and colonies they possessed and controlled. Statistical mapping grew into an important tool for government bureaucracy, and map use and interpretation practices widely disseminated to schools and other institutions for the sake of social regulation.¹⁶ During the nineteenth century, geography lost some of its permeability with other fields as it became institutionalized as a discipline in Britain, Europe, and the United States. Along with cartography, geography began to serve the interests of nation and empire in utilitarian and ideological manners. The “Darwinian Revolution” and “Neo-Lamarckianism” (beliefs about the organic roots of genetic factors in the environment) influenced the development of “environmental determinism,” a now discredited pseudo-scientific geographical perspective arguing that peoples’ regional environments determined racial and cultural differences. Meanwhile, as Neil Smith observes, the conflation of geography, cartography, and the ideology of imperialism shaped British geographer Halford Mackinder’s concepts of the “world-island” and the “geographical pivot of history” as well as US historian Frederick Jackson Turner’s “end of the frontier” thesis on the settlement and closure of the American West. However, such

perspectives also raised a few questions. If geographers had entirely mapped, enumerated, and described all the world’s cultures, territories, and nations—“relegating geography to the realm of the fixed”—then what purpose and further utility could the discipline offer? Indeed, fears of “the end of geography” at the end of the nineteenth century, fostered by a chimerical belief in the “closure of absolute space provoked powerful ideological effects” in many political and academic circles.¹⁷

As Smith notes, the era spanning the 1880s through the early 1920s stands out as a time of political and economic turmoil and a transformation in culture and science. These four decades marked unprecedented creativity and the development of new concepts and ways of considering the world.¹⁸ During this period, modernist literature, music, art, and architecture developed, and, just as profoundly, the apprehension and depiction of space and time became inseparably interlinked, notes Henri Lefebvre. The shock waves of this seismic cultural shift first reverberated through intellectual and artistic spheres, where the old “clock-work universe” *formulae* of space and time dissolved in the face of Einstein’s mind-bending theory of relativity. In the works of Paul Cézanne and the school of analytical cubism, perceptible space and perspective disintegrated as the line of horizon disappeared from paintings.¹⁹ Pablo Picasso’s 1937 painting *Guernica* illustrates this shift in perception (figure 2.3).

In geography, Carl Ortwin Sauer (1889–1975) and the Berkeley School of Cultural Geography developed a new methodological lens based on a cultural concept of landscape that rejected the idea of environmental determinism. Sauer’s morphological studies of regions and societies placed particular emphasis on the temporal dimension of a panoramic lens:

We cannot form an idea of landscape except in terms of its time relations as well as its space relations. It is in continuous process of development, or of dissolution and replacement.²⁰

The school emphasized a synchronic approach to researching and mapping historical, cultural, and physical landscapes. Although empirically oriented in his methodology, Sauer



Figure 2.3 The ruins of space and time: Czechoslovakian postage stamp of Picasso’s *Guernica*. Stamp image courtesy vvoe/Shutterstock.com. Stamp shows *Guernica* painting by Pablo Picasso from Museo Nacional Centro de Arte Reina Sofia (ca. 1967).

recognized the significant role that subjective perception played in creating distinct “senses of place” rooted in the phenomenological symbiosis existing between particular regions and cultures.

Nevertheless, twentieth-century cartography remained anchored in Euclidean geometry, even as intellectual and artistic praxes moved toward Einsteinian concepts of time-space.²¹ These parallel tracks, which resembled the approaches of Cartesian perspectivalism and the seventeenth-century Dutch mapping impulse, manifested as two distinct schools of geographic practice. The former gave birth to the quantitative revolution of the 1950s and 1960s, with its emphasis on spatial modeling and computing, while the latter shaped geography’s second cultural turn during the 1970s and 1980s, during which humanistic and postmodern scholars applied the metaphor of *text* to the acts of reading landscapes, conducting fieldwork, and framing social life.²²

Post-structuralist perspectives

During this period, the word *mapping* emerged as a significant metaphor in the arts and humanities as scholars began to show strong interests in the roles of place, space, and the implicit geographical dimensions of literary and cultural texts.²³

Emphasizing the spatial and postmodern trends emerging in the 1980s, Roland Barthes defined the word *text* as “a multi-dimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations drawn from the innumerable centres of culture.”²⁴ The cross-pollination of these two methodological metaphors across disciplinary boundaries informed cartographic historian J. B. Harley’s seminal observation:

“Text” is certainly a better metaphor for maps than the mirror of nature. Maps are a cultural text. By accepting their textuality we are able to embrace a number of different interpretative possibilities. Instead of just the transparency of clarity we can discover the pregnancy of the opaque.²⁵

Despite the new semiotic approach to studying landscape, by the end of the twentieth century, developments in computer science allowed GIS to become the indispensable tool for geographical research and analysis in government, business, and academia.²⁶

This development in the arts and humanities coincided with the unprecedented phenomena of digital globalization facilitated by visual broadcast media and the World Wide Web. Marshall MacLuhan’s observation in 1964 that, after more than a “century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned,” was radically prescient.²⁷ The ubiquitous use of personal computers, tablets, and smartphones; consumption of 24-hour mass-media outlets; and proliferation of social media profoundly shaped twenty-first-century geographic perceptions and practices. GIS, GPS, computer cartography, and online open-source geospatial software are framing the earth as a geocoded world that is continuously being coded, decoded, and recoded as new cybernetic language systems and platforms emerge and evolve.²⁸ Manuel Castells’ argument

that the geography of the new history will be constructed out of the interface between places and flows seems remarkably apt.²⁹ Contemporary human geographical practices are engaging space as a dynamic “lifeworld” and a “quasi-material construct” produced by social interaction. Rather than a passive container, today space is increasingly considered as an active agent, infused with human behavior and perception, which is constantly shaping, producing, and reproducing places socially, politically, and economically.³⁰

Recently, Nigel Thrift has promoted nonrepresentational theory as an experimental perspective concerned with *the geography of what happens*. This approach pulls the vibrant energy of the performing arts into the social sciences by crawling out on the edge of a conceptual cliff. Thrift proposes that, because of the intervention of software, the human body has become a tool-being in symbiosis with a new electronic time-space that shapes our perceptions and experiences of the world, echoing Donna Haraway’s cyborg theory.³¹ Therefore, the current geographical concern with human performativity and dynamic social space, and their relationships to “automated” mapping functions, cyber linguistics, and Web 2.0 (social media)/3.0 (semantic, geosocial, and 3D visualization) platforms, can facilitate deeper and more experimental forms of GIS engagement with research and scholarship in the arts and humanities.

Deep mapping

As a result of the spatial turn in the humanities, the word *mapping* became a discursive metaphor that scholars employed to discuss the spaces and places that shaped literary and historical texts and were represented in them. By establishing humanities GIS models, scholars can now explore, survey, chart, map, and navigate textual journeys in a literal sense. Traditionally, under the umbrella of spatial science, users employed GIS to map distributions and patterns but engaged little in mapping the lyrical, subjective, temporal, and esoteric notions of place and human experience. The predominant positivistic perspective encounters a greater challenge in performing qualitative analysis and visualizing critical theoretical relationships in GIS, as well as capturing the dynamic nature of evolving networks, the cascade of historical events, and the myriad social flows that interlink people and places.³²

By adopting postmodern approaches, however, we can use GIS technology to create unique opportunities to construct alternate constructions of history and culture that embrace multiplicity, simultaneity, complexity, and subjectivity.³³ By placing historical and cultural exegesis more explicitly in space and time, GIS can identify patterns, facilitate comparisons, enhance perspectives, and visualize data in any number of ways. Currently, humanities-influenced methodologies are taking GIS technology beyond the limits imposed by positivism. Examples include “deep-mapping” techniques and approaches that engage oral cultures and storyscapes, detect semiotic traces on landscapes, and provide experiential interfaces with virtual data and immersive geospatial environments.

The writer William Least Heat Moon (William Trogdon) first conceptualized deep mapping as a vertical form of travel writing in his book *PrairyErth* (1991). This approach both records

and represents the grain and patina of place through the interpenetrations and juxtapositions of the past and the present, the political and the poetic, and the discursive and the sensual.³⁴ David Bodenhamer asserts that using GIS deep-mapping methodologies to fuse qualitative and quantitative data acknowledges the reality of multi-scalar and dynamic space-time.³⁵ GIS techniques can assemble and visualize layers with different degrees of transparency to integrate oral testimony, anthology, memoir, biography, and natural history.³⁶ Similarly, Mark Palmer, in his work on Kiowa oral culture and storyscapes, coined the neologism *indigital GIS* to describe networks of indigenous, scientific, and technological knowledge systems that engage science, symbols, and stories to create fragmentary and contradictory geo-narratives full of uncertainties.³⁷ Researchers phonetically coded Kiowa and Latin alphabets into geodatabases to create maps that trace everyday paths by combining remote-sensing images and data from the Internet. This shape-shifting through GIS allows users to dramatize Kiowa oral culture and storyscapes that present long-elapsed events that unfold as if before one's eyes and summarily strips away a type of historical theater of the past.³⁸ By integrating Kiowa language, perceptions of terrain, seasons, the solar cycles, and the Milky Way in a dynamic and holistic fashion as geo-narrative art, Palmer's GIS storyscape techniques—with its many kinds of fusion, interbreeding, and boundary crossing—illustrate the direction of digital mapping.³⁹

In addition, Wolfgang Moschek and Alexander von Lünen have engaged GIS as a means to semiotically track and interpret the ruins of limes, ancient Roman border fortifications located in Britain, as *signs* of a cultural mentality inscribed on the landscape to delineate perceived "civilized" and "barbaric" spaces.⁴⁰ Von Lünen argues that while positivists interpret such sources as open windows into the past, postmodernists perceive them as fences obstructing vision.⁴¹ Modeling semiotic data in GIS resembles the early stages of tracking, through which a postmodern detective (fictional or actual) identifies and interprets clues to understand how their sources speak.⁴² Once clues are assembled and parsed, GIS is engaged—not as a cartographical tool but rather as the intuitive scratchpad of a bricoleur—to encode scanned archival maps with clues that semiotically transform the *signified* source into an active and present historical *signifier*. Semiotic GIS techniques allow the practitioner to *arrange* and *elicit* signifier-signified meanings and intentions in human traces (records, documents, artifacts), rather than simply *analyze* established historical narratives.⁴³

Last, Trevor Harris has created a visualization-gaming platform called *The Cave*, which immerses users in GIS-rendered landscapes, such as nineteenth-century Morgantown, West Virginia, to facilitate a phenomenological experience of a different environment, period, and place. Similar to the holodeck from *Star Trek*, this experiential form of GIS projects 3D models of townscapes and terrains—sourced from cartographical, archival, scientific, census, and literary data—on the walls, floor, and ceiling of an enclosed space. Individual users can then navigate the virtual environment to explore the fully rendered visualization from their own perspectives. To foster a user's sensual embodiment of the streets of Morgantown two centuries ago, Harris integrates sound effects, such as a beating heart that quickens as one navigates near townscape locations identified by nineteenth-century writers and historians as places of perceived fear or danger.⁴⁴ This type of immersive, experiential GIS environment also enables individuals and groups to create their own forms of visualization by interacting experimentally with virtualized spatial data.⁴⁵

The preceding examples of humanities-based applications illustrate that GIS is not a fixed or singular identity but instead a technology that, with creativity and innovation, we can reconceptualize and retool to conduct more qualitative, lyrical, artistic, esoteric, and phenomenological forms of research.⁴⁶ These examples also show how the strong influence of humanities disciplines on GIS innovation can provide a new and ontologically different reality to geography itself.⁴⁷ Furthermore, these GIS models considered in the context of Deleuze and Guattari's thought can provide a space of conjecture in which to reconcile the literary, artistic, and scientific roots of geography as well as provide a way to reimagine the potential of geospatial technology applications and research for humanities scholarship.

GIS and the space of conjecture

According to Deleuze and Guattari, both mapping and writing possess the power to anticipate and reimagine configurations of space, time, language, and culture, which have either been submerged by Cartesian space or yet to be perceived and represented. In their books, "one has the sense that there is only geography, nothing but geography: maps, planes, surfaces, strata, spaces, territories, transversals, etc."⁴⁸ Their conception of striated and smooth space links, respectively, to *arborescent* and *rhizomatic* forms of epistemology. Deleuze and Guattari use the first term to describe hierarchical, finite, and closed systems of thought and representation and invoke the rhizome as a curling, anarchic, subterranean plant root system to illustrate the interconnectivities that link society, writing, technology, and the human mind. Subsequently, a few creatively minded geographers have used this metaphor to manage the messiness of interactions and interconnections between human and physical systems.⁴⁹

Pickles and Harley observed that cartography originally developed as a particularly controlling gaze, tied to certain forms of parametric space, geometry, and scale, which by the nineteenth century had developed into an empirical "scientific" practice anchored firmly by positivistic perspectives. However, Harley notes that the "steps in making a map—selection, omission, simplification, classification, the creation of hierarchies, and 'symbolization'—are inherently rhetorical."⁵⁰ With the advent of GIS technology, the infusion of humanities practices and discourses of postmodernism into the syntax of cartography has significantly changed the discipline to allow new concepts to develop. In this respect, GIS appears to function as a type of automated rhetorical tool. William Cartwright notes:

Clicking icons, rather than remembering long, alphanumeric strings revolutionized the way in which users interacted with a package. To properly understand each of the elements in a geographical information package, a number of metaphors may have to be used if the complex nature of the real world is to be presented in simplified, understandable ways.⁵¹

Spatial analysis in GIS is generally qualitative, visual, and intuitive, despite its technology being insistently pigeonholed as a tool for solely quantitative applications.⁵² In fact, a good

portion of GIS attribute data is qualitative in nature—including names (such as owners of land parcels, businesses, and street addresses) and types or labels (such as roads, settlements, and soils). In most cases, this factor makes such types of attribute data unsuitable for quantitative analysis, so they are usually queried and logically manipulated by employing the SQL (structured query language) feature of GIS—a parsing tool closer to the study of philology than it is to physics. The performance of complex attribute queries in GIS requires more than just statistical or mathematical aptitude; it demands logical thinking and spatial imagination—skills the humanities can hone.⁵³

However, quantitative skills are still important to the practice of GIS; its mastery relies on both literacy and numeracy. To fully harness a humanities GIS model to our research purposes, we must create new vocabularies of space to serve them. In *A Thousand Plateaus*, for example, Deleuze and Guattari proposed such a vocabulary and coined new terms and phrases, such as *assemblage*, *deterritorialization*, *lines of flight*, *nomadology*, and *rhizome/rhizomatics*, to describe spatial relationships and the ways we conceive people and other objects moving in space.⁵⁴ Observed in the context of the twenty-first-century digital revolution, an integrated, multidimensional GIS application compares to a standard cartographic map “as the internet [does] to a letter.”⁵⁵ Online and desktop GIS provide unprecedented rhizomatic networking potential by employing the hyper-connectivity of the web to survey, chart, and navigate new and emerging configurations of space and time. As Umberto Eco observes, “the rhizome is so constructed that every path can be connected with every other one. It has no center, no periphery, no exit, because it is potentially infinite. The space of conjecture is a rhizome space.”⁵⁶ Such a space can provide a way to consider and imagine how, in a humanities GIS model, the ancient literary, artistic, and scientific branches of Western geography, in tandem with the “three key referencing systems—space, time and language—might be engineered”—as John Corrigan phrases it—“in such a way that changes in one ripple into the others.”⁵⁷

Sources

- 1 P. Booker and A. Thacker, *Geographies of Modernism: Literatures, Cultures, Spaces* (London and New York: Routledge, 2005).
- 2 Romm, *Edges of the Earth*, 3–4.
- 3 G. Olsson, *Abysmal: A Critique of Cartographic Reason* (Chicago: The University of Chicago Press, 2007), 32.
- 4 Ibid.
- 5 J. K. Wright, *Human Nature in Geography* (Cambridge: Harvard Press, 1996), 11.
- 6 Certeau, *Practice of Everyday Life*, 121.
- 7 Ibid.
- 8 Ibid.
- 9 J. Pickles, *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World* (London and New York: Routledge, 2006), 80.
- 10 Ibid, 84–85.
- 11 Ibid.
- 12 Ibid.
- 13 Ibid., 80.
- 14 R. J. Mayhew, *Geography and Literature in Historical Context: Samuel Johnson and Eighteenth-Century English Conceptions of Geography* (Oxford: School of Geography, 1997), 7, 43.
- 15 J. B. Harley, “Deconstructing the Map” *Cartographica*, 26, no. 2 (1989): 4.
- 16 Cosgrove, “Maps, Mapping, Modernity,” 37.
- 17 N. Smith, *American Empire: Roosevelt’s Geographer and the Prelude to Globalization* (Berkeley: University of California Press, 2002), 14.
- 18 Ibid., 13.
- 19 H. Lefebvre, *Critique of Everyday Life*, vol. 3, from *Modernity to Modernism (towards a Metaphilosophy of Daily Life)*, trans. G. Eliot (London: Verso, 2005), 46.
- 20 C. O. Sauer, *The Morphology of Landscape* (University of California Publications in Geography, 1925), 36.
- 21 H. Lefebvre, *Critique of Everyday Life*, vol. 1, *Introduction*, trans. J. Moore (London: Verso, 1992), 46.
- 22 Pickles, *A History of Spaces*, 54.
- 23 Thacker and Brooker, *Geographies of Modernism*, 1.
- 24 R. Barthes, *Image: Music: Text*, trans. S. Heath (Glasgow: Fontana, 1982), 146.
- 25 Harley, “Deconstructing the Map,” 7–8.
- 26 J. E. Dobson, “The Geographical Revolution: A Retrospective on the Age of Automated Geography,” *The Professional Geographer*, 45 (1982): 431.
- 27 M. McLuhan, *Understanding Media: The Extensions of Man* (London and New York: Routledge, 1987), 3–4.
- 28 Pickles, *A History of Spaces*, 5.
- 29 M. Castells, “Grassrooting the Space of Flows,” *Urban Geography*, 20, no. 4 (1999): 294–302.
- 30 Historically, ideas about the nature of space have been considered by Gottfried Wilhelm Leibniz (1646–1716), David Émile Durkheim (1858–1917), Martin Heidegger (1889–1976), Maurice Merleau-Ponty (1908–61), and Henri Lefebvre (1901–91). Geographers such as Gunnar Olsson, Anne Buttmer, Yi-Fu Tuan, Nigel Thrift, David Harvey, Doreen Massey, and Edward Soja have drawn from their works to inform their geographical methodologies.
- 31 N. Thrift, *Non-Representational Theory: Space/Politics/Affect* (London and New York: Routledge, 2008), 2, 10, 12, 18, 89.
- 32 M. Pavloskaya, “Theorizing with GIS: A Tool for Critical Geographies?” *Environment and Planning A*, 38 (2006): 2015.
- 33 D. J. Bodenhamer, “Creating a Landscape of Memory: The Potential of a Humanities GIS,” *International Journal of Humanities and Arts Computing*, 1, no. 2 (2007): 102, 107.
- 34 M. Pearson and M. Shanks, *Theatre/Archaeology* (London and New York: Routledge, 2001).
- 35 D. J. Bodenhamer, “Beyond GIS: Geo-Spatial Technologies and the Future of History,” in *History and GIS: Epistemologies, Considerations and Reflections*, eds. A. von Lünen and C. Travis (New York: Springer, 2012), 12.
- 36 Pearson and Shanks, *Theatre/Archaeology* (London and New York: Routledge, 2001), 65.
- 37 M. Palmer, “(In)Digitizing Cáuigú Historical Geographies: Technoscience as Postcolonial Discourse,” in *History and GIS: Epistemologies, Considerations and Reflections*, eds. A. von Lünen and C. Travis (New York: Springer, 2012), 43.
- 38 Palmer, “(In)Digitizing Cáuigú Historical Geographies,” 55.
- 39 Dennis Wood, *Rethinking the Power of Maps* (New York: Guilford, 2010), 111, quoted in Mark Palmer, “Theorizing Indigital Geographic Information Networks,” *Cartographica: The International Journal for Geographic Information and Geovisualization*, 47, no. 2 (2012): 80–91.
- 40 A. von Lünen, “Tracking in a New Territory: Re-imagining GIS for History,” in *History and GIS: Epistemologies, Considerations and Reflections*, eds. A. von Lünen and C. Travis (New York: Springer, 2012), 211–39.
- 41 Ibid.
- 42 A. von Lünen, “History and GIS: Epistemologies, Considerations and Reflections.” Panel session, “Historians in Space,” Graduate Conference in European History, Budapest, Hungary, April 25, 2013.
- 43 Lünen, “Tracking in a New Territory,” 211–39.

- 44 T. M. Harris, L. J. Rouse, and S. Bergeron. "Humanities GIS: Adding Place, Spatial Storytelling and Immersive Visualization into the Humanities," *GeoHumanities: Art, History, Text at the Edge of Place*, eds. M. Dear et al. (London and New York: Routledge, 2011), 226–40.
- 45 T. M. Harris and P. Hodza, "Geocollaborative Soil Boundary Mapping in an Experiential GIS Environment," *Cartography and Geographic Information Science*, 38, no. 1 (2011): 20–35.
- 46 Pavloskaya, "Theorizing with GIS," 2014.
- 47 Aitken and Craine, "Affective Geographies and GIScience," 144.
- 48 Notably, *Anti-Oedipus*, *Kafka, A Thousand Plateaus*, and *What is Philosophy?*, M. A. Doe and D. B. Clarke, "Giles Deleuze," in *Key Thinkers on Space and Place*, eds. P. Hubbard, R. Kitchin, and G. Valentine (London: Sage, 2006), 104.
- 49 N. Chrisman, "Full Circle: More than Just Social Implications of GIS," *Cartographica*, 40, no. 4 (2005): 28.
- 50 Harley, "Deconstructing the Map," 11.
- 51 W. Cartwright, "Applying the Theatre Metaphor to Integrated Media for Depicting Geography," *The Cartographic Journal*, 46, no. 1 (2001), 28.
- 52 Pavloskaya, "Theorizing with GIS," 2011, 2013.
- 53 Ibid.
- 54 N. Gough, "Geophilosophy and Methodology: Science Education Research in a Rhizomatic Space" (unpublished chapter, prepared for UNESCO-SAARMSTE book project on methodologies for researching mathematics, science, and technological education in societies in transition, 2005), accessed February 1, 2011, http://www.bath.ac.uk/cree/resources/noelg_SAARMSTE_ch.pdf.
- 55 Ibid.
- 56 U. Eco, *Postscript to the Name of the Rose*, trans. W. Weaver (New York: Harcourt Brace Jovanovich, 1984), 57.
- 57 J. Corrigan, "Qualitative GIS and Emergent Semantics," in *The Spatial Humanities*, 85.

Chapter 3

Writing time and space with GIS: The conquest and mapping of seventeenth-century Ireland

Period, place, and GIS

In *The Landscape of Time* (2002), John Lewis Gaddis links the ancient practice of mapmaking with the three-part conception of time (past, present, and future) that many historians apply to their work. Both practices manage infinitely complex subjects by imposing abstract grids over them—in forms such as hours and days or longitude and latitude on landscapes or timescapes. Observing this, he asks, "What if we were to think of history as a kind of mapping?"¹ If the past is a landscape and history the way we represent it, and pattern recognition constitutes the primary form of human perception, Gaddis reasons, then history, from the epic to the simple narrative, seeks to discern patterns in much the same way that we would a landscape. This landscape metaphor accommodates varying degrees of complexity, not only as a reflection of scale but also for the information available at any given time concerning a particular landscape, geographical or historical.²

Incorporating Gaddis' metaphor into a humanities GIS model can reconcile the discursive and visual tropes Herodotus and Strabo established 2,000 years ago to tell stories about times, places, and events. This relationship between historical and geographical practices has not completely disintegrated through the ages. John Smith, in his *Generall Historie of Virginia* (1624), declared, "As geography without history seemeth a carcass without motion, so history