

The ‘Abstract Machine’ of Historical GIS
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Map from *Italia Antiqua* (1624)

Piceni et Vestinorum, Pelignorum, Marrucinatorum; ac Frentanorum agri descriptio,
1624 - Philip Clüver

Slide 2

Introduction

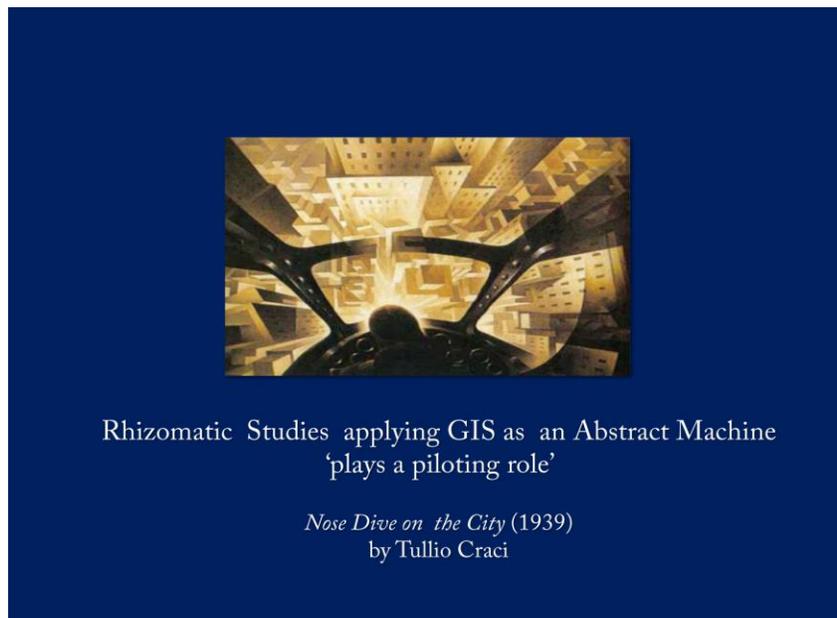
In Carl Sauer’s 1941 address *Foreword to Historical Geography*, the dean of the Berkley School of Cultural Geography claimed that historical geographers must possess the ability to see a past landscape through ‘the eyes of its former occupants, from the standpoint of their needs and capacities,’¹ and place themselves ‘in the position of a member of the cultural group and time being studied.’² Sauer observed that ‘it is also possible to imagine a culture area which in the course of time shifts away completely from an earlier location and still maintains organic continuity.’³ Sauer recognized the dynamic and morphological relationship between culture, time and space, and landscape which in his time eluded the static domains of much mid

¹ Carl Sauer, ‘Foreword to Historical Geography,’ *Annals of the Association of Geographers* 31.1 (1941) p. 10.

² Ibid.

³ Ibid.

twentieth century conventional cartographic representation. **Slide 2** In his address, Sauer pointed to the early modern German geographer and historian Phillip Clüver's skilful seventeenth century reconstructions of ancient Germany and Italy which drew upon knowledge of both classic literature and landscape.



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The GIS Abstract Machine

Clüver's hermeneutic practice sets a precedent for what I term as the Spatio-Discursive Representation and Analysis capabilities of GIS which can be employed in spatialized studies of literary, cultural and historical subject matter. GIS has been described as 'a *discipline* which uses human and electronic cybernetic systems to further understanding of physical and social systems,'⁴ and its mapping and analysis functions and outputs can be seen to operate in such a dimension. Such cybernetic perspectives emerged in 'the late twentieth century' as human interactions with technology as Donna Haraway notes, became 'theorized' and viewed as

⁴ J. E. Dobson, Reply to comments on 'Automated geography' *The Professional Geographer* 35 (1983) (349-53) p. 351.

‘fabricated hybrids of machine and organism; in short, . . . cyborgs.’⁵ As a consequence, Western ontologies and epistemologies became ‘technologically disrupted’ due to the mass proliferation of cybernetic assemblages. Far from being deterministic or dystopian, Haraway contends that cyborg imagery can suggest a way out of the maze of dualisms [and] provide a foundation from which to build and destroy machines, identities, categories, relationships and space stories.⁶ By adopting Giles Deleuze and Felix Guattari’s theoretical perspective GIS as an Abstract Machine can be conceptualized as an ontological practice to ‘extend’ in Marshall McLuhan’s phrase - the ability of our nervous systems to recognize, manipulate, analyze, parse create and study stories about movement, place and time. In *A Thousand Plateaus: Capitalism and Schizophrenia* (1988) Deleuze and Guattari state that the primary function of an ‘abstract machine’ is ‘*diagrammatic* (it knows nothing of the distinction between artificial and natural)’⁷ and the pair provide examples of other human-technological interfaces through which such an assemblage has manifested: **Slide 3**

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 machine⁸

In *A Thousand Plateaus*, Deleuze and Guattari also state that ‘writing has nothing to do with signifying. It has to do with surveying, mapping, even realms that are yet to come.’⁹ GIS can be re-conceptualized to ‘write, and form a rhizome,’¹⁰ which is composed of directions of motion

⁵ Donna Haraway, ‘A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,’ in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York; Routledge, 1991), (pp.149-181) p.151

⁶ Haraway, ‘A Cyborg Manifesto’ 181

⁷ Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. B. Massumi. (London: Athlone, 1988) 141

⁸ Ibid., 142.

⁹ Ibid., 4-5

¹⁰ Ibid., 11

from a milieu which grow, and overflow a plateau.¹¹ Unlike hierarchical ontological and epistemological schemas symbolized by trees and roots, rhizomatic space connects any point to any other point.¹² **Slide 4** Rhizomatic studies of history, literature or culture in cybernetic assembly with GIS can ‘play a piloting role which does not function to represent, even something real, but rather constructs a real that is yet to come, a new type of reality.’¹³ GIS mapping performances on a rhizomatic plateau, ‘necessarily acts on semiotic flows, material flows, and social flows simultaneously [and] there is no longer the tripartite division between a field of reality (the world) and a field of representation (the book) [or the map] and a field of subjectivity (the author) [or the mapmaker].’¹⁴

In general, GIS mapping as David J. Staley notes, allows ‘a kind of multidimensional emplotment: a single story organized from multiple and heterogeneous elements,’¹⁵ and the paper’s example will imbue ‘a spatial totality’¹⁶ on the study of the Sauerian-like impressions of landscape, identity and sense of place which emerged in Irish poet Patrick Kavanagh’s literary canon as it evolved over time and space. **Slide 5** Kavanagh was born the son of a farmer and cobbler in rural Inniskeen Parish, Co. Monaghan in 1904, migrated to Dublin in 1939 and died in 1967.

¹¹ Ibid., 21

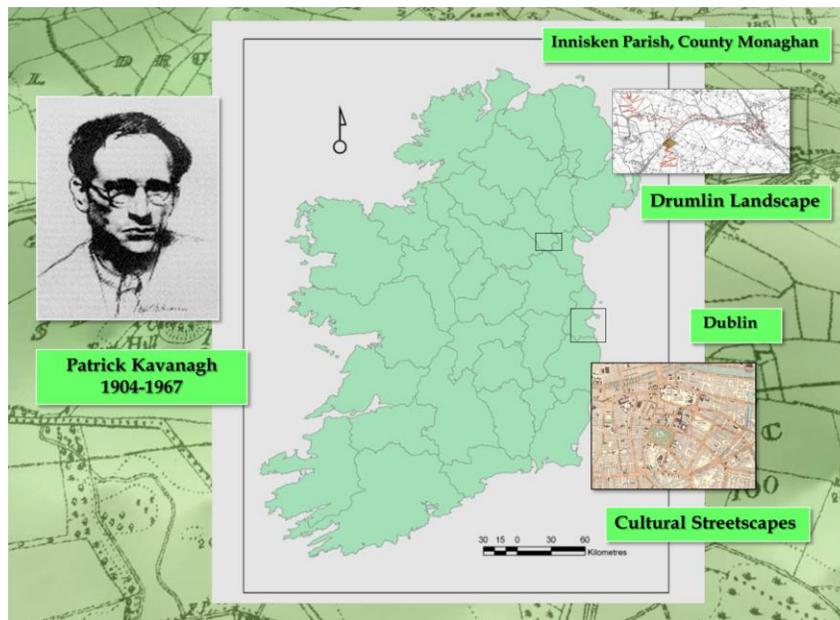
¹² Ibid., 21

¹³ Ibid., 141-142

¹⁴ Ibid., 23

¹⁵ D. J. Staley, ‘Finding Narratives of Time and Space’ in (eds.) D.S. Sinton & J.J Lund, *Understanding Place: GIS and Mapping Across the Curriculum* (Redlands, 2007) 43.

¹⁶ Ibid.



Slide 5

His life and work embodies the demographic shift which took place in Ireland during the twentieth century as the population drained from the countryside into the island's cities, and through ports of emigration. **Slide 6** Kavanagh's novel *The Green Fool* (1938) and epic poem *The Great Hunger* (1942) provide contesting phenomenological representations of the lifeworlds of small farmers living amongst the rounded drumlin hills and fields of Inniskeen Parish. The novel is marked by a 'topophilic' and pastoral impression of the people and the landscape of South Ulster; the epic poem prophesizes a insular townland, with a dwindling population of sexually starved bachelor farmers and bitter spinsters, who because of the land inheritance practice of primogeniture are experiencing personal 'apocalypses of clay.'¹⁷ The poem written from the perspective of a rural migrant in an urban milieu, elicits a sense of 'topophobia' which verges on 'topocide' or 'the annihilation of place.'¹⁸

Slide 7 By employing Mikhail M. Bakhtin's notion of historical poetics in which time-space chronotopes act as 'nodes' which tie narrative strands, biographical data and

¹⁷ P. Kavanagh, *The Great Hunger*, (Dublin, 1942) 33.

¹⁸ J. D. Porteous, 'Topocide: The Annihilation of Place' in (eds.) J. Eyles and D.M. Smith, *Qualitative Methods in Human Geography* (Cambridge: Polity Press, 1988)

geographical locations together in the space of a text, I was able using GIS's Spatio-Discursive Representation and Analysis potential to map and storyboard Kavanagh's spatial performances in **Slide 8** Inniskeen and **Slide 9** Dublin respectively to discern his composite lifepaths as a farmer, and struggling man of letters. **Slide 10** The GIS storyboards also provides a frame to employ Henri Lefebvre's spatial triptych which considers 'a rapprochement between physical space (nature), mental space (formal abstractions about space), and social space (the space of human action and conflict and 'sensory phenomena').¹⁹ The first is designated by Kavanagh's drumlin landscapes and Dublin's streetscapes; the second by the use of historical Ordnance Survey Maps, and the third speaks to both Kavanagh's 'rhizomatic' lifepaths, his **Slide 11** chronotopic representations of Inniskeen parish, as well as the farming and primogeniture practices which marked the social and cultural sphere of the parish and led to alternative Idyllic and Peripheral experiences of place in the novel and poem respectively. Kavanagh's representation of place from the bucolic to the apocalyptic correlate with **Slide 12** contrasting spatial patterns, illustrated by which his respective rural and urban composite lifepath mappings illustrate; the former is centrifugal, while the latter is centripetal. From an urban perspective, the centering rural idyll pattern of *The Green Fool* spins into a peripheral prison of clay in *The Great Hunger*:

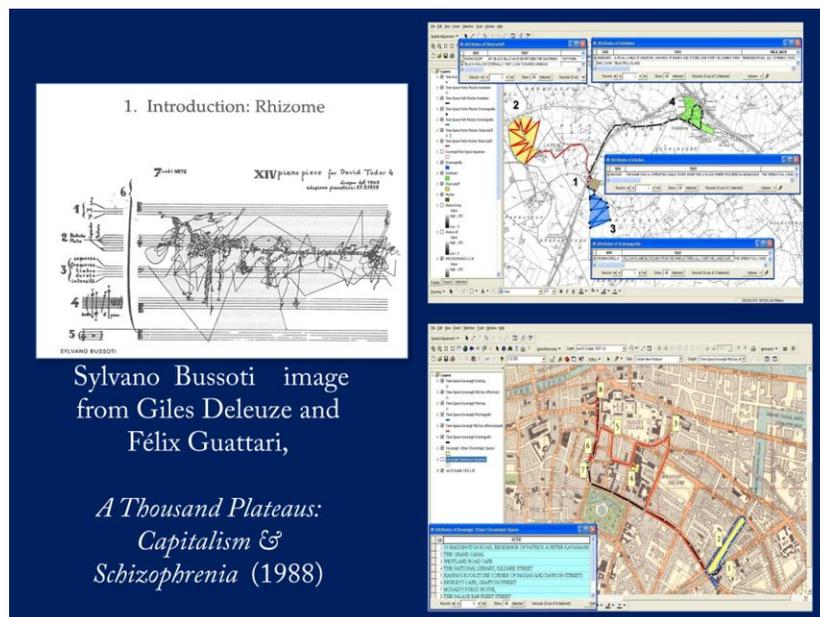
But the peasant in his little acres is tied
To a mother's womb by the wind-toughened navel-cord
Like a goat tethered to a stump of a tree-
He circles around and around wondering why it should be.²⁰

Both Bakhtin's and Lefebvre's spatial lenses can be viewed as radical and discursive geographical information systems and coupled with this discussion's conceptualization of GIS

¹⁹ Andrew Merrifield 'Henri Lefebvre: A socialist in space' in (eds.) Mike Crang and Nigel Thrift, *thinking space*, (London: Routledge, 2002) pp. 170-171.

²⁰ Patrick Kavanagh, *The Great Hunger*, 29.

technology as an ‘abstract machine’ for literary, cultural and historical studies allows one to perceive how Kavanagh’s distinct experiences of rural and urban space are “deterritorializing” in relation to the other precisely because it [the GIS abstract machine] diagrams it, carries it off, raises it to its own power.”²¹ From Michel’s Foucault’s perspective, the contrasting *topophilic* / *topophobic* ‘heterotopias’ of Inniskeen Parish represented in Kavanagh’s novel and epic-poem when ‘spatially parsed’ through this ‘abstract machine’ convey, counter and **Slide 13** deterritorialize official period Irish State representations of rural Ireland as Gaelic Eden, as embodied by *Eamon de Valera’s Speech to the Nation*, erroneously known as the ‘Dancing at The Cross Road Speech’ Broadcast on St Patrick’s Day by Radio Éireann on March 17th, 1943.



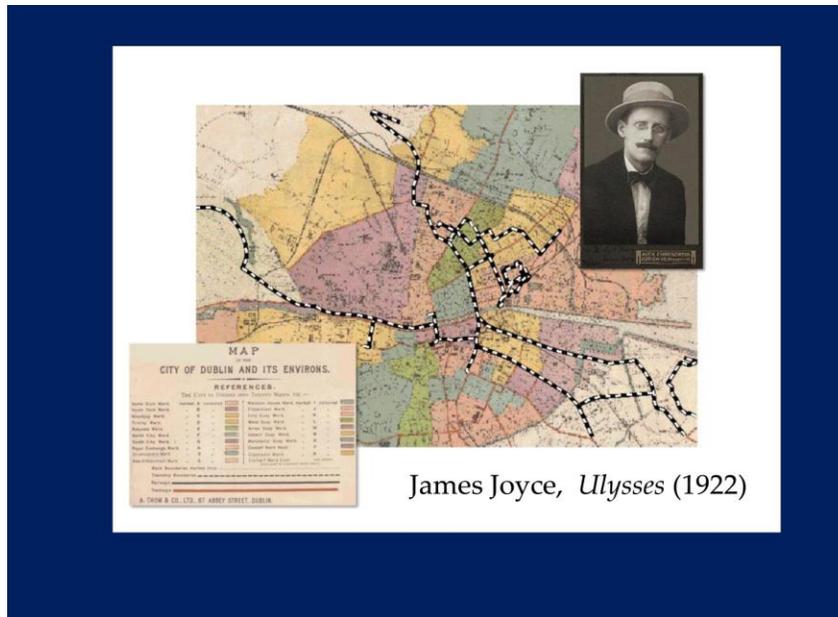
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Slide 14 Returning to Deleuze and Guattari’s *A Thousand Plateaus*, I was struck by Sylvano Bussoti’s illustration of what appears to be a ‘thousand lines’ of Deleuzo-Guattarian ‘flight’ annotated ‘rhizomatically’ across the horizontal staves of a sheet of music paper. The

²¹ Deleuze and F. Guattari, *A Thousand Plateaus*, 141-142.

polylines which trace the daily lifepaths of Kavanagh in the GIS Storyboard to my eye, reflected a similar pattern. Just as the ‘lines of flight’ stood in contrast to the striations of sheet music in the Buttoni image, Kavanagh’s spidery lifepaths seemed to unfurl ‘rhizomatically’ against the Cartesian grids of the Ordnance Survey Maps of Inniskeen Parish and Dublin City and spill into another plateau of experience. In light of this, I started to think about the operations of the GIS suite as a series of spaces or plateaus on which to ‘experiment,’ ‘perform’ and ‘paint’ different senses of spatialities: Stored data created the possibility for the ‘thousand lines of flight,’ suggested by Deleuze and Guattari. Michel de Certeau’s notion of the modern map as a form of ‘theatre’ translated the functions, operations and visualization capacities of GIS into the cinematic realm. Indeed, it has been observed that ‘like driving and flying, the cinema offers a kinetic spatial experience characteristic of modernity, transforming the possibilities for representing space cartographically.’²² So, I started applying filmic techniques and discovered through GIS I could ‘scopically’ manipulate relationships between various types of documents, and spatial annotations, to reimagine cartographic perspectives and recreate the dynamics of historical events. **Slide 15** For instance, using archival documents, I was able to ‘write’ a cinematic map of the seventeenth century Irish rebellion against the English crown, as the rising spread (or in Deleuzo-Guattarianese, ‘spilled’) across different regions of the island from October 1641 to January 1642. I was able to create eight different colored ‘plateaus of rebellion’ which cascaded downwards in elevation through time, from the uprising’s origins in Ulster, to its apogee in Munster (The Dublin region remained in Crown control). I could rotate the three-dimensional model to spatially represent and examine the chronology of this historical event.

²² Denis Cosgrove, ‘Maps, Mapping, Modernity: Art and Cartography in the Twentieth Century,’ *Imagi Mundi*, Vol 57/1, 2005 (35-53) p. 50.



Slide 17

Conclusion

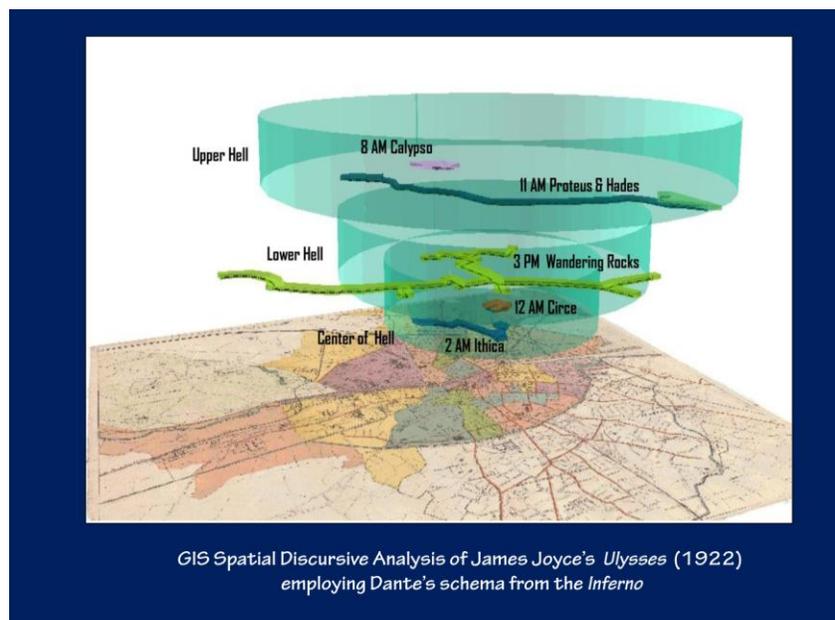
In conclusion, GIS provides a panoply of plateaus and layers upon which as David Bodenhamer observes one can locate ‘historical and cultural exegesis more explicitly in space and time.’²³ Such applications of GIS in the interests of the humanities can aid in identifying ‘patterns,’ facilitate ‘comparisons,’ enhance ‘perspectives’ and illustrate ‘data.’²⁴ As Deleuze reflecting upon Foucault reminds us: ‘historical formations . . . [are] sedimentary beds, [. . .] made from things and words. Each stratum implies a distribution of the visible’.²⁵ In addition, Friedrich Nietzsche makes a distinction in *Untimely Meditations* (1876) between three epistemologies of historical inquiry: the monumental, the antiquarian and the critical. **Slide 16** With GIS one can ‘spatialize’ these three perspectives into sedimentary beds and abstracted layers. It is well known that Homer’s *Odyssey* was James Joyce’s principal influence, but by

²³ D. Bodenhamer, ‘Creating a Landscape of Memory: the Potential of a Humanities GIS’ *International Journal of Humanities and Arts Computing*, 2 (2007) p. 107.

²⁴ Ibid.

²⁵ Gilles Deleuze, *foucault* (trans./ed) Sean Hand (London: The Athlone Press, 1999) pp. 47-48.

employing GIS Spatio-Discursive Representation and Analysis techniques, **Slide 17** it is possible to visualize and discuss how Italian poet Dante Alighieri's (1265-1321) work, *La Divina Commedia* (1308-1321) and the spatial schema of his first cantica, *Inferno* (Hell) in particular also shaped the narrative space of *Ulysses* (1922). **Slide 18** This epic poem provides a cosmography, which is strikingly different in its spatiality, than the geographies of the *Odyssey*. Its narrative comprises Dante's descent, with the Roman poet Virgil, down through three levels which contain nine circles of suffering to the Center of Hell. In *Ulysses*, Leopold Bloom and Stephen Dedalus' treks across Dublin on the sixteenth of June 1904, descent into Nighttown and return to 7 Eccles Street to witness the 'heaventree of stars' hanging outside Bloom's house early on the morning of the seventeenth, intimates the Dantean journey into hell and escape to purgatory to view the mount of paradise.



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By applying a critical spatial approach to the monumental and antiquarian aspects of Joyce's work, and the cartographic reference of the 1904 edition of *Thom's Official Directory of the*

United Kingdom of Great Britain and Ireland, it is possible to provide a plateau upon which to study how Joyce ‘deterritorialized’ Dublin from the its Roman Catholic and British Imperial cultural imprints; in doing so his text can be seen to act a spatio-discursive geographical information system which charted a spiritual liberation for the Irish nation. Finally, when reconceptualizing GIS for literary, cultural and historical practice, we must avoid the pitfalls of ‘spatial science’ which at times elides the human element from skeletal, statistical models of place, which can emerge in the quantification of spatial representation and analysis. Though I conceptualize GIS in Deluzeo-Guattarian terms as an Abstract Machine, which can perform Spatio-Discursive Representation and Analysis, in addition to more nuanced quantitative forms of socio-spatial-statistical modeling, I recognize that its use must first serve the questions proffered by the approaches of a spatial history. As David Bodenhamer states the employment of GIS in the humanities is not to simply recreate or map the past in a literal sense, but to identify its causal threads and to understand its complex social and cultural rhythms.’²⁶ By employing ‘narrative’ alongside ‘algorithmic,’²⁷ applications, GIS utilized in a Sauerian fashion to view past landscapes from ‘the eyes of its former occupants, from the standpoint of their needs and capacities,’ can aid the practice of history to more clearly ‘qualify, highlight, or subdue [causal] threads, and rely upon emphasis, nuance, and other literary devices to achieve the complex construction of past worlds.’²⁸

²⁶ Bodenhamer, ‘Creating a Landscape of Memory’ 102.

²⁷ Ibid.

²⁸ Ibid.