ABSTRACT MACHINE – GEOGRAPHICAL INFORMATION SYSTEMS (GIS) FOR LITERARY AND CULTURAL STUDIES: 'MAPPING KAVANAGH'

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Abstract   *Drawing upon previous theoretical and practical work in historical and qualitative applications of Geographical Information Systems (GIS), this paper, in Giles Deleuze and Félix Guattari's terminology, conceptualizes GIS as 'an abstract machine' which plays a 'piloting role' which does not 'function to represent' something real, but rather 'constructs a real which is yet to come.' To illustrate this digital humanities mapping methodology, the essay examines Irish writer Patrick Kavanagh's novel* The Green Fool *(1938) and epic poem* The Great Hunger *(1946) and their respective contrasting* topophilic *and* topophobic *renderings of landscape, identity and sense of place under the lens M.M. Bakhtin's 'Historical Poetics' (chronotope) to illuminate GIS's ability to engage in spatio-discursive visualization and analysis. The conceptualizations and practices discussed in this paper reconsider GIS software/hardware/techniques as a means to engage subjects of concern to literary and cultural studies commensurate with the recent strong interest in the geographical and spatial dimensions of these cognate areas.*

INTRODUCTION

With Geographical Information Systems (GIS) software it is possible to chart the trajectories of a writer's biography and plot the resulting spaces against the distinct historical poetics of place which emerge from the writer's successive works. This type of GIS mapping, as David J. Staley notes, allows 'a kind

of multidimensional emplotment: a single story organized from multiple and heterogeneous elements,'[1] which can imbue 'a spatial totality'[2] on the study of a particular writer's experience and representation of place, as it evolves over time. Engaging GIS to map such a critical literary geography, intimates the splendid ambiguity of a journey into the unknown. The County Monaghan poet Patrick Kavanagh (1904–1967) undertook a similar journey when he embarked from his rural parish of Inniskeen in County Monaghan, to the capital of Saorstát na nÉireann (Irish Free State) in 1931. Of this experience, he wrote:

> Ten miles from home I was in strange country, among folk who wouldn't know me [...] A granite milestone along the way told me it was forty-five miles to Dublin: the chiselled letter-grooves were filled with moss and I had to trace the letters with my finger like a blind man reading Braille.[3]

Such a perspective informs the use of GIS to explore and juxtapose the spatialities of Kavanagh's life as a farmer-poet with his early years in Dublin, after he relocated to the city in 1939. David J. Bodenhamer informs us that by 'locating historical and cultural exegesis more explicitly in space and time,'[4] GIS applications in the humanities can aid in finding 'patterns,' facilitate 'comparisons,' enhance 'perspectives' and illustrate 'data.'[5]

In the case of Kavanagh, two distinct 'senses of place' of south Ulster, distinguish his first novel *The Green Fool* (1938) from his epic poem *The Great Hunger* (1942). The former is marked by a 'topophilic' and pastoral impression of the people and natural landscape of Kavanagh's native parish of Inniskeen. According to the human geographer Yi-Fu Tuan such a sensibility denotes 'the affective bond between people and place or setting.'[6] The epic poem in contrast, announces an '*apocalypse of clay*,'[7] for the same landscape. It is written from the perspective of an urban milieu, and elicits a sense of 'topophobia' which verges on 'topocide' or 'the annihilation of place.'[8] Tuan notes that for an individual 'many distinctive types of fearsome landscape exist,'[9] one being 'the fear of the imminent collapse of his world,'[10] a trope which infuses *The Great Hunger*. Though composed only four years apart, the contrast in Kavanagh's representations of place are stark. For instance, the depictions of his birth-place of Mucker and other townlands in the parish of Inniskeen in Kavanagh's early poetry and first novel were laced with lyricism, dry humour, laconic observation, and suffused with a mystic-like illumination of the surrounding vistas and their idiosyncratic social geographies:

> The bicycles go by in twos and threes-
> There's a dance in Billy Brennan's barn to-night,
> And there's the half-talk code of mysteries

And the wink-and-elbow language of delight
[. . .]
A road, a mile of kingdom. I am king
Of banks and stones and every blooming thing.[11]

However, after living in Dublin during the grim years of 'The Emergency,' Kavanagh published *The Great Hunger,* a piece which in Gilles Deleuze and Félix Guattari's terminology, 'deterritorialized' the pantheistic 'Gaelic Eden' representations of rural Ireland promulgated by nationalists and *literati* alike in the early twentieth century. The poem conveys the social desolation of bachelor–farmer Patrick Maguire, gazing with impotent fury upon the south Ulster drumlin landscape which has trapped his body, mind and soul:

He stands in the doorway of his house
A ragged sculpture of the wind
October creaks the rotted mattress
The hungry fiend
The bedpost fall. No hope. No lust.
Screams the apocalypse of clay
In every corner of this land.[12]

In *Moving through Modernity: Space and Geography in Modernism* (2003), Andrew Thacker notes that 'both social space and literary space operate in relationship to historical co-ordinates,'[13] and asserts that 'we should reconnect the representational spaces on literary texts not only to material spaces they depict, but also reverse the moment.'[14] Thacker also observes that a 'critical literary geography would trace how social space intrudes upon the internal constructions of spatial forms,'[15] and places an emphasis on the point that '*Literary texts* [*not only*] *represent social spaces, but social space shapes literary forms.*'[16] Such forms according to Thacker include 'typography and the layout on the page; the space of the metaphor . . . the shifting between different senses of space . . . or the very shape of narrative forms,'[17] including 'circular patterns.'[18] By employing GIS's ability in such a manner to visualize historical, cultural and literary data in conjunction with M.M. Bakhtin's 'chronotopic' theory on space and narrative, this paper will illustrate and discuss the relationship between Kavanagh's impressions of place and his quotidian performances in the rural landscapes of Monaghan and upon the urban streetscapes of Dublin. Before undertaking this expedition in critical literary geography, precedents for such a journey must be considered.

CONCEPTUALIZING A CRITICAL LITERARY GEOGRAPHY FOR GIS

The recent 'cultural' turn in geography and the 'spatial' turn in literary and cultural studies comprise two ends of an epistemological bridge from which the perspective of a 'critical literary geography' constituted within the framework of a humanities focused application of GIS can be considered. Literature, human geographers note 'generate particular geographies'[19] and can form 'the basis for a new [and] 'cleansed' perception [s],[20] of a place, a region and its people. Recently, geography as a discipline has acknowledged the *agency* of literary texts and writing practices in fostering cultural production, social critique and the creation of 'place.' In literary and cultural studies, Franco Moretti's *Atlas of the European Novel* (1998), stands in distinction to Thacker's *Moving Through Modernity* (2003). Moretti applied geometric and quantitative analysis, to examine the production, content and form of nineteenth century English and Continental literature. In contrast, Thacker employs critical theory to illuminate socio-spatial and affective dimensions of place representation in the modernist genre. Such approaches in the study of literary geography have been discursive in nature. With the evolution of GIS capabilities, and the emergence of other geospatial technologies and Web 2.0 open source software interfaces, it is now possible to revisit and extend this interdisciplinary research foci into digital realms. This provides a liminal space in which to create unique assemblages, new forms of interactions, analysis and visualizations upon a global cybernetic platform.

The employment of GIS software and technical analysis in the fields of the humanities and social sciences has emerged recently. Notably, Ian Gregory and Paul Ells' *Historical GIS: Technologies Methodologies and Scholarship* (2007) provides a conceptual overview and scope for choroplethic, quantitative and attribute mapping approaches. 'Qualitative' and 'Time-Space' approaches in GIS have been pioneered by Mariana Pavloskaya, Megan Cope, Sarah Elwood, Natalie Schuurman, and Mei-Po Kwan among others, in extending the use of the geo-spatial technology for feminist and ethnographic research. As a chief proponent of Humanities GIS, Bodenhamer notes that 'the power of GIS lies in its ability to integrate data from a common space [. . .] and to visualize the results in combinations of transparent layers on a map of the geography shared by the data.'[21] Stuart Aitken and James Craine also stress that 'using GIS anyone can visually construct – or deconstruct- a spatial reality'[22] resulting in a 'profound experiential and epistemological shift undergone by an increasingly digital culture.'[23] They further contend that 'GIS and its digital spatialities offer previously undiscovered sites of geographic exploration.'[24] Bodenhamer asserts that the goal of Humanities GIS is not to recreate or map the past, but to identify its causal threads and to understand its complex social and cultural rhythms.'[25] By employing 'narrative' rather than 'algorithmic,'[26] applications, GIS can be

applied to 'qualify, highlight, or subdue these threads, and rely upon emphasis, nuance, and other literary devices to achieve the complex construction of past worlds.'[27]

One literary device with applications for the literary and cultural use of GIS can be identified in literary theorist Mikhail M. Bakhtin's (1895–1975) concept of 'Historical Poetics.' Originating in an evolutionary study of Greek epics, folkloric tales of medieval Europe, and the modern novels of Rabelais, Flaubert, Stendhal, Balzac and Dostoevsky, Bakhtin identified a series of successive tempo-spatial *leitmotifs* which emerged from the canon of Western literature over the course of a millennia. He concluded: 'We will give the name *chronotope* (literally, 'time space') to the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature.'[28] From the classics, Bakhtin identified the 'idyll,' the 'road,' the 'public square'; from nineteenth century literature, the 'salon & parlor,' the 'petty-bourgeois town,'[29] and other abstract chronotopes which embraced the growing urban modernity of the early twentieth century.

Bakhtin notes: 'In the literary artistic chronotope, spatial and temporal indicators are fused into one carefully thought-out, concrete whole. Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot, and history.'[30] Chronotopes serve 'as the primary point from which 'scenes' unfold 'within narrative space,'[31] and act as 'an optic for reading texts as x-rays of the forces at work in the culture system from which they spring.'[32] In this regard, chronotopes posses biographical dimensions, which intersect with literary counterparts to reflect the particular environment and period experienced by a writer. Bakhtin observes that it is '*living* artistic perception . . . [which] seizes on the chronotope in all its wholeness and fullness,'[33] and asserts that 'a definite and absolutely concrete locality serves as the starting point for the creative imagination [. . .] this is a piece of human history, historical time condensed into space.'[34]

In Kavanagh's body of work the parish, the townland and fields act as the chronotopes of the rural society and landscape he lived in, and wrote about. However, after relocating to Dublin in 1939, his performance in the urban chronotopic spaces of the city, illustrated a different pattern, daily rhythm, and literary perspective, than his life as a farmer-poet.

GIS AND KAVANAGH'S HISTORICAL POETICS

Mapping Kavanagh's chronotopic shift links GIS visualization and analysis capabilities with the practices of literary theory and the Web 2.0 open source software interfaces of SIMILE[35] Timeline, and Wordle. These applications are being employed in the *Digital Literary Atlas of Ireland, 1922–1949* project
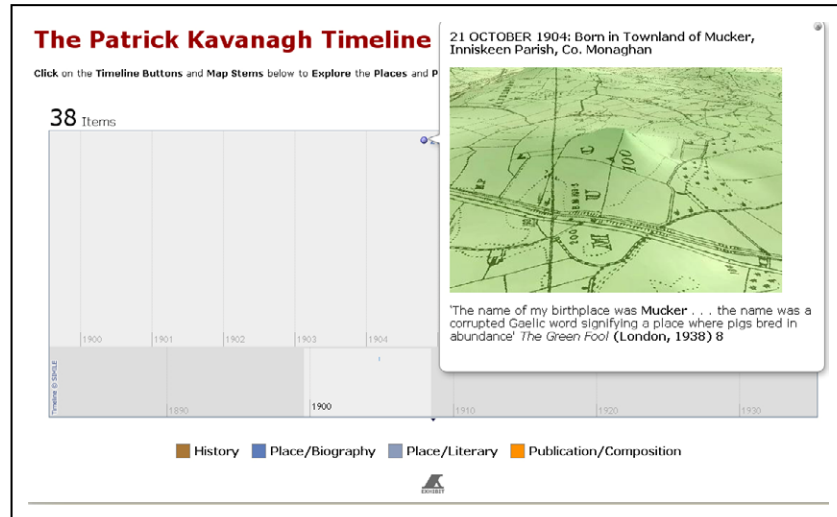
Figure 1. Kavanagh Timeline from Digital Literary Atlas of Ireland, 1922–1949.

(http://www.tcd.ie/longroomhub/digital-atlas) at the Trinity Long Room Hub. One such excerpt from this digital humanities project, illustrates that Kavanagh was born on 21 October 1904 at the base of a small drumlin: 'The name of my birthplace was Mucker [. . .] the name was a corrupted Gaelic word signifying a place where pigs bred in abundance'[36] (Figure 1). His father was a tradesman and a farmer; by the socio-economic indices of the parish, the family was relatively affluent by local standards, and was able to save funds and purchase farming properties, thereby extending their land holdings to the adjoining townlands of Drumnagrella and Shancoduff. Kavanagh, the eldest son of nine children and the natural heir to this land, lived the life of a farmer while cultivating his early poetry: 'As I wandered about the roads and fields I composed my verses.'[37] The drumlin topography of south Ulster which inspired his early work (Figure 2), was formed from glacial 'scrapings of the Ulster hills'[38] which were 'deposited under the ice as it moved into the Central Lowlands.'[39] As a result, the landscape is 'a confusion of little hills and winding streams, small lakes, and bogs.'[40] Kavanagh recalled 'When I arrived in Mucker the natives were beginning to lose faith in the old, beautiful things. The ghost of a culture haunted the snub-nosed hills.'[41] He first travelled to Dublin in 1931 to visit the poet AE Russell, who encouraged him to nurture his poetic impressions. His collection *Ploughman and Other Poems* was subsequently published in 1936. In May 1937, Kavanagh travelled to London and secured a commission to write a 'peasant' biography, due to the successes of Maurice O'Sullivan's *Twenty Years A-Growing* (1933) and Tomás
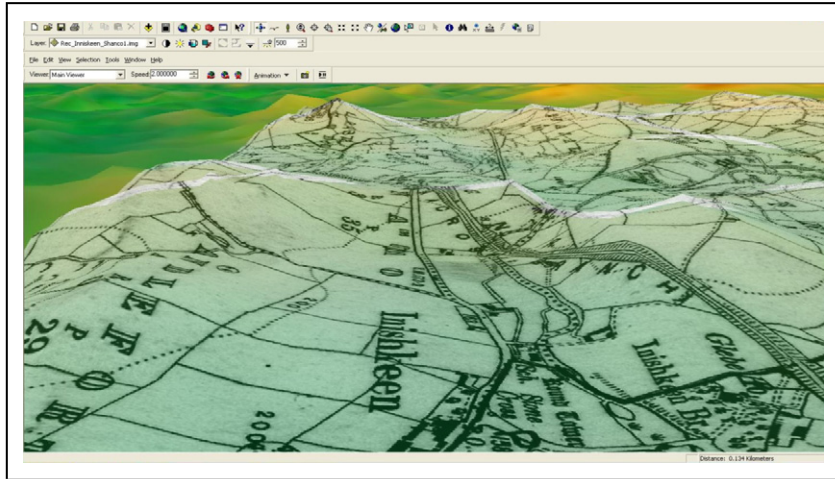
Figure 2. GIS 3D Visualization of Inniskeen Parish.

Ó Criomhthain's *The Islandman* (1934). He published his semi-autobiographical novel under the title *The Green Fool* in 1938.

Rural landscape chronotopes

Kavanagh's prose style is particularly suited to GIS visualization as it inherits the 'Gaelic bardic tradition of *dinnsheanchas* (knowledge of the lore of places)[42] and accordingly reflects an intimate 'geography based on *seanchas*, in which there is no clear distinction between the general principles of topography or direction-finding and the intimate knowledge of particular places.'[43] Literary and biographical narratives interweave in *The Green Fool*, and are rooted in Bakhtin's notion of the 'idyll.' This chronotope denotes,

> an organic fastening-down, a grafting of life and its events to a place, to a familiar territory, [...] the conjoining of human life with the life of nature, the unity of their rhythm [and] the common language used to describe phenomena of nature and the events of human life.[44]

The ArcView GIS mapping interface (Figure 3) can be used as a means to storyboard chronotopic aspects of Kavanagh's writing and daily rhythms as a farmer in Inniskeen during the 1920s and 1930s. GIS software can also host digitized historical maps (such as Ordnance Survey (OS) layers 29 and 32, which were published in 1911). These map layers can be rendered, manipulated, and visualized to temporize Kavanagh's early years. The digitized maps in Figure 3
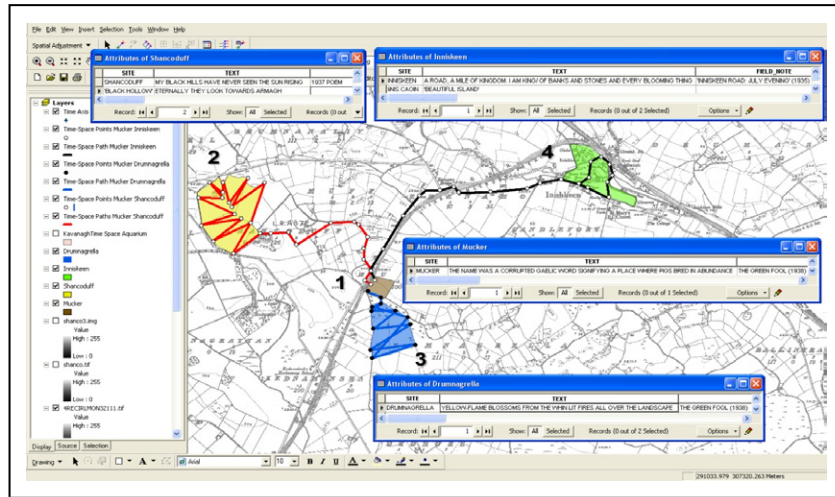
Figure 3. GIS Storyboard of Inniskeen Parish, 1920–1939.

contain place-names translated by the original OS in 1835, naming the townland of Mucker (No. 1/Figure 3), the fields of Shancoduff – *Seanchua Dubh* 'Black Hollow' (No. 2/Figure 3) and Drumnagrella – *Droin* 'Ridge' (No. 3/Figure 3) and village of Inniskeen – *Inis Caoin* 'Beautiful Island' (No. 4/Figure 3). Attribute tables were created for each of the digitized location (Mucker, Shancoduff, Drumnagrella and Inniskeen) to facilitate the juxtaposition of spatial and literary data.

Active fieldwork in the parish consisted of visiting the sites and charting the paths taken by Kavanagh, based upon his speculative movements over the terrain on a daily basis. Such an embodied mapping performance of his daily movements, though hypothetical, is also pragmatic in the sense that the topography of the townlands through which he walked, has changed very little, if at all – the shortest contemporary pedestrian routes would have been for all practical purposes, very similar to those which Kavanagh might have taken, if he wanted to 'shave a hair off time.' Drawing upon biographical information and walking/driving surveys of this landscape, these routes were noted and recorded. When they were later plotted upon the digitized OS maps of Inniskeen parish, within the ArcView GIS interface, a composite spatial pattern was discerned. Rising before, dawn, Kavanagh would have performed chores around his family's house in Mucker. Then having the energy from a full night's rest, he probably would have set out to work in the farthest fields of Shancoduff (No. 2/Figure 3) located on the northern slope and basin of a sizable drumlin. Fieldwork surveys noted that it took approximately 15 to 20 minutes
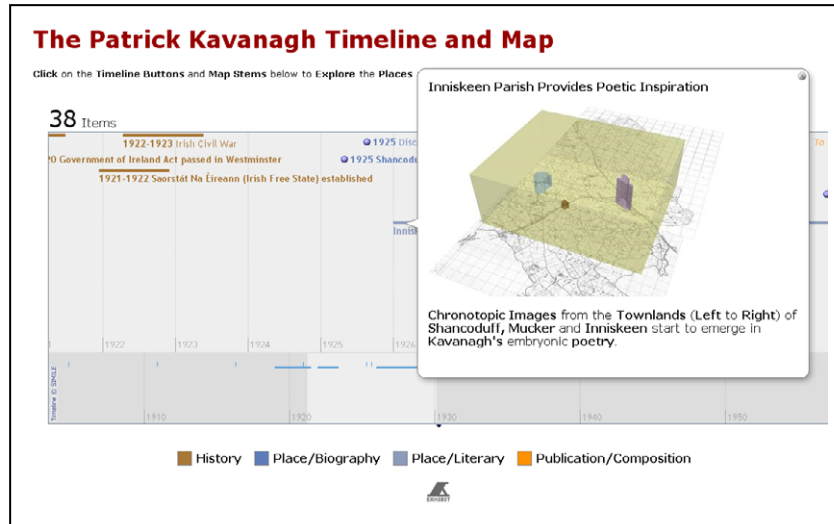
Figure 4. Kavanagh Timeline from Digital Literary Atlas of Ireland, 1922–1949.

to walk from Mucker to Shancoduff, a circuitous route, given the formidable elevation of the drumlin. Of the fields, Kavanagh wrote: 'Poets had surely put the names on them. Translated from the Gaelic they were: "The Field of the Shop", "The Field of the Well", "The Yellow Meadow", "The Field of the Musician".'[45]

Depending on the day and season, Kavanagh would have spent different amounts of time working in these four fields. Perhaps he would eat lunch on site, or return to Mucker. It was speculated that generally in the afternoon, he would have gone to the fields at Drumnagrella, adjacent to his family's holding, after expending the morning's energy on the family's farthest holding in Shancoduff. In the evening, he might have travelled to Inniskeen village to socialize, as depicted in the poem *Inniskeen Road: July Evening* (1935). Three respective polylines (red for morning; blue for afternoon and black for evening) and points trace Kavanagh's speculative movements during the course of a day over the landscape of the parish. Though his daily movements may have varied, given the location of the family holding at Mucker in relation to the family's fields and village of Inniskeen, a composite pattern of centrality features in the GIS visualization. Kavanagh acknowledged that a commensurate 'sense of place' emerged in his poetic voice in the 1920s (Figure 4). In later years he noted: 'My idea of a cultural parochial entity was the distance a man would walk in a day in any direction. The center was usually the place where oneself lived though not always.'[46]
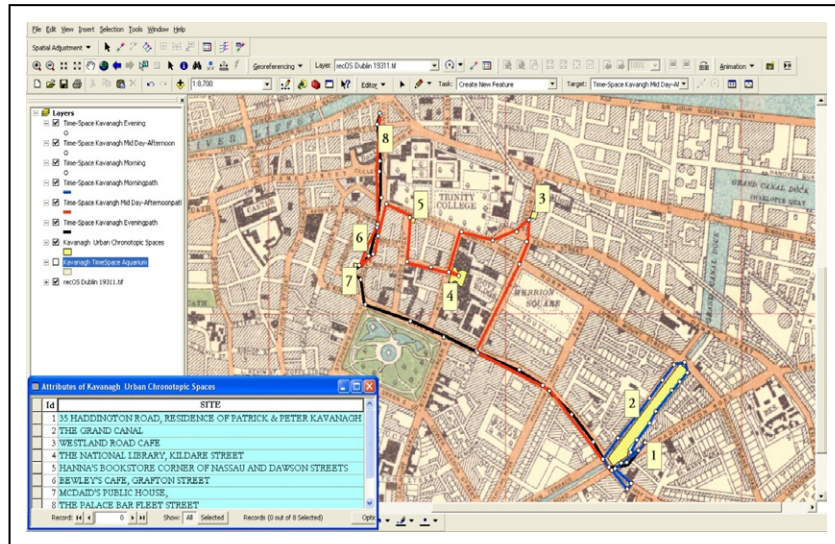
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Figure 5. GIS Storyboard of Dublin 1940s.

Urban streetscape chronotopes

By October 1939, Kavanagh had relocated to a tiny-bed sit with his brother Peter, at 35 Haddington Road (No. 1/Figure 5) adjacent to Dublin's Grand Canal. He had by this time published a piece 'Europe is at War' in *The Irish Times* which captured the gloomy atmosphere of this period and place:

> Midnight in Dublin. A wild but not cold October wind, is driving rain against my window. The last buses are swishing by on the blassy-bright streets. The radio in the flat above me has stopped forwarding to this address the mixture of blather and jazz, which is called propaganda, and which is supposed to influence the masses.[47]

Employing GIS to chart Kavanagh's quotidian movements in Dublin, was similar in scale – if not in scope, to surveying his daily movements through Inniskeen parish. The main difference involved directed hermeneutic-mapping performances in the cafes, pubs, libraries and other places, such as the banks of the Grand Canal (Figure 6), which he was known to haunt after his relocation to Dublin. The *modus operandi* in this instance, involved reading selected pieces of Kavanagh's works within the spaces which may have influenced and shaped their composition. From this, it was possible to reflect on how his urban
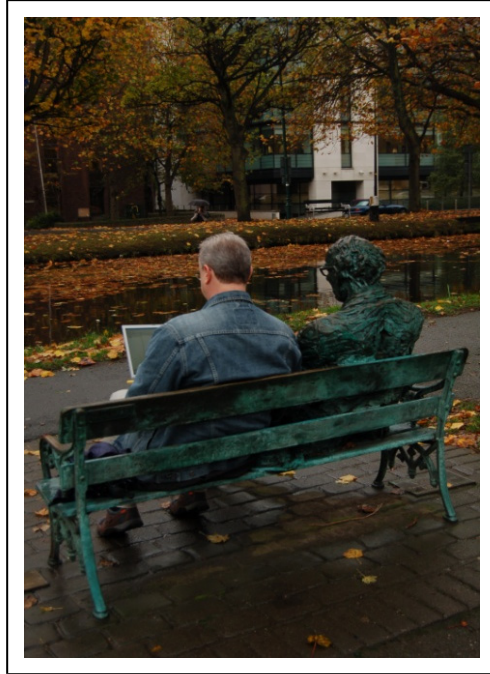
Figure 6. Patrick Kavanagh Statue, Grand Canal, Dublin (Photo: Stephen McCarron).

pedestrian practices and experiences may have anticipated and incorporated to a certain extent, the *Situationist Internationale*'s (SI) concepts of *dérive* and *pyschogeographie.* Conceived in 1958 by Guy Debord and his associates, the former comprises 'a technique of rapid passage through varied ambiances,'[48] which involves urban drifting. This in turn can produce the experiences of the latter, or 'the specific effects of the geographical environment (whether consciously organized or not) on the emotions and behaviour of individuals.'[49] These concepts offer a plausible schema which suggest the inter-play between writer and urban place in the production of literature.

The ArcView GIS map interface in Figure 5 reflects the 'hermeneutic-mapping' fieldwork exercise which identified sites which Kavanagh was known to frequent in the early 1940s. His movements were reconstructed in the following manner. Kavanagh would write in his bedsit (No. 1/Figure 5) – and frequent the Grand Canal (No. 2/Figure 5) in the morning time. The blue polylines in the lower right hand corner of Figure 5 capture the speculative movements of his morning routines. In the afternoon, Kavanagh would walk to meet his brother for lunch at a Westland Row cafe (No. 3/Figure 5) and
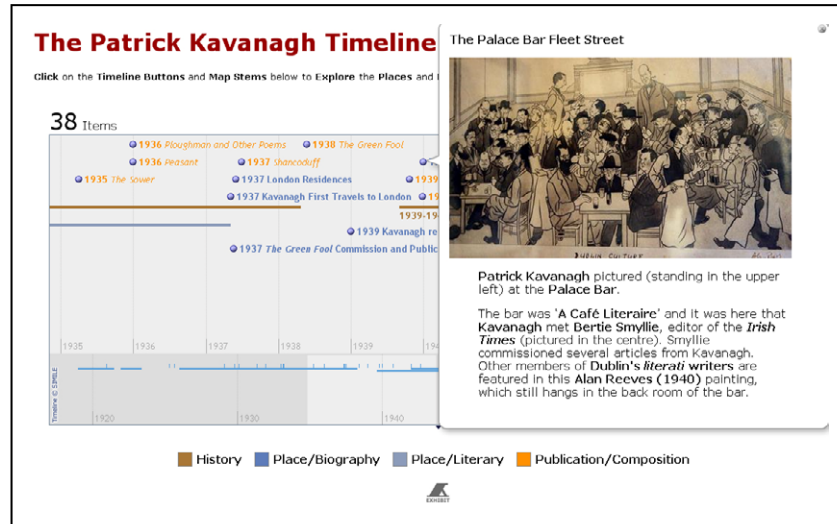
Figure 7. Kavanagh Timeline from Digital Literary Atlas of Ireland, 1922–1949.

afterwards wander into a 'cultural chronotopic sphere' (Figure 10) which contained the National Library on Kildare Street (No. 4/Figures 5), Hanna's Bookstore on the corner of Dawson and Nassau Streets (No. 5/Figure 5) and Bewely's Cafe on Grafton Street (No. 6/Figures 5). The red polyline charts his mid-day and afternoon movements. His afternoon and evening perambulations could overlap with stints in McDaid's Public House on Harry Street (No. 7/Figures 5) and the Palace Bar on Fleet Street (No. 8/Figures 5). The black polyline traces a possible evening walk back from the bar, which was a space of great significance to Kavanagh's development as a writer. Located across Westmoreland Street from the old *Irish Times* offices, the Palace Bar was as 'A Café Literaire.'[50] Its space approximates Bakhtin's chronotope of the 'salon and parlor,'[51] (Figure 7) where 'webs of intrigue are spun, denouements occur and finally [...] dialogues happen.'[52] This space serves as 'a barometer of political and business life; political, business, social, literary reputations are made and destroyed, careers [are] begun and wrecked,'[53] in which 'the graphically visible markers [...] of biographical and every day time are concentrated and condensed.'[54] The Palace Bar provided Kavanagh entry into Dublin's literary circles. Nicknaming it the 'Malice Bar,' Kavanagh recalled that Bertie Smyllie 'the giant Hemingway-esque editor of the *Irish Times*,'[55] instituted a branch office of the *Times* at the bar by his nightly patronage: 'almost everyone who counted in journalism and the arts was to be seen in the Palace Bar at some time on the evening of the week:
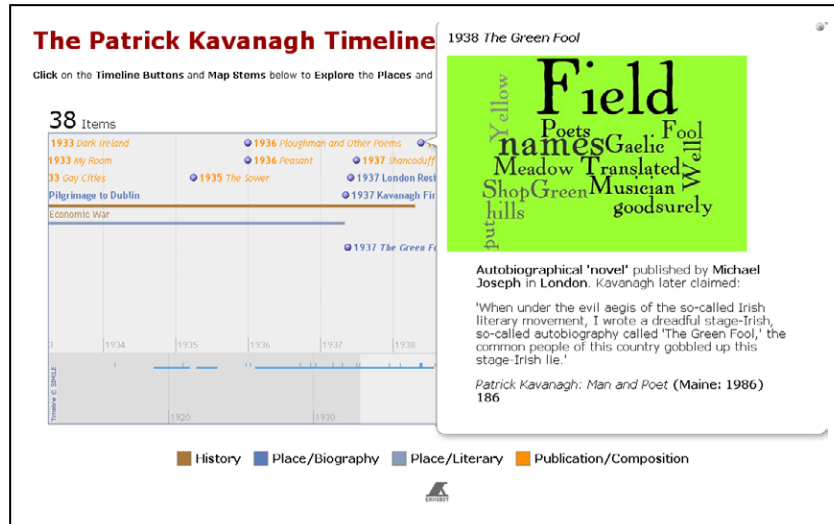
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Figure 8. Kavanagh Timeline from Digital Literary Atlas of Ireland, 1922–1949.

F.R. Higgins, poet and Abbey Theatre director, M.J. MacManus, novelist and literary editor of the *Irish Press*.'[56] One evening in 1939 Kavanagh auspiciously drew the attention of Smyllie, by studiously ignoring fellow writer Francis MacManus: 'I shouted loudly: "I don't know you and I don't want to know you." The editor of *The Irish Times* threw the side of his head backward listening. I was elected. I wasn't going to have my career ruined by Catholic writers.'[57] Subsequently, Kavanagh was commissioned to write articles for the newspaper.

Rural/urban shift

Juxtaposing the GIS mappings of Kavanagh's movements in Inniskeen and Dublin, one is struck by the contrasting spatial patterns; the former is centrifugal, while the latter is centripetal. From a literary perspective, Timeline 'Wordle' visualizations of excerpts from *The Green Fool* (Figure 8) and *The Great Hunger* (Figure 9) respectively intimate a change in Kavanagh's place perception and representation. From a spatial perspective, Kavanagh's Dublin peregrinations loop through a nodal network (Figure 10) of cafes, bookshops, libraries and literary pubs (which incidentally are located adjacent to seats of power, knowledge and finance such as the Irish parliament, Trinity College and the Bank of Ireland). The SI's concepts of *dérive* and *pyschogeographie* can aid our understanding of the 'special effects' which may have impacted Kavanagh's
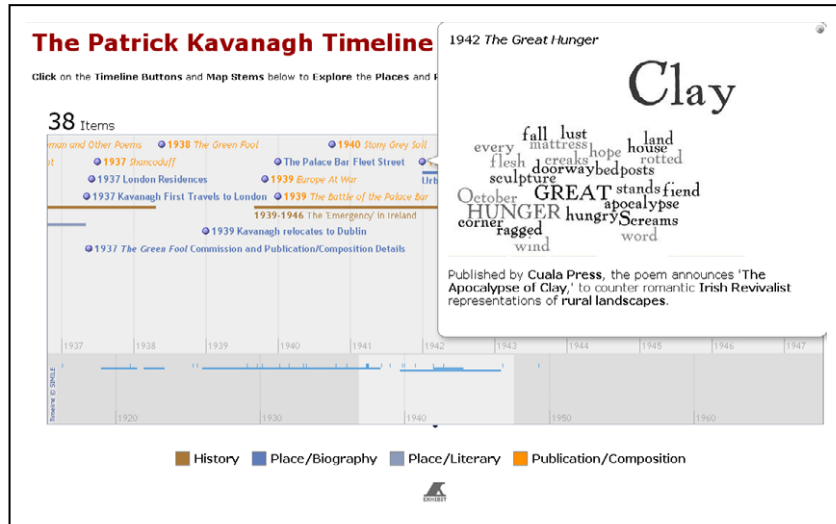
Figure 9. Kavanagh Timeline from Digital Literary Atlas of Ireland, 1922–1949.
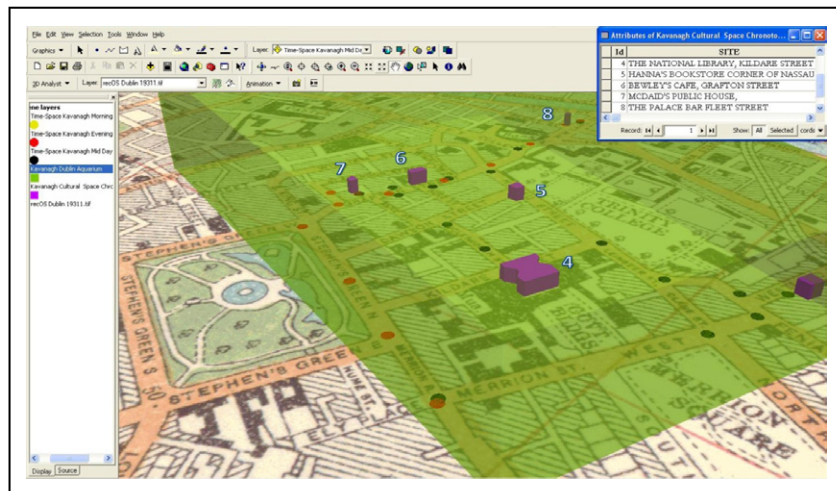

Figure 10. GIS 3D Visualization of Dublin Cultural Chronotopic Nodes.

behaviours and emotions as he moved through these social spaces. His urban streetscape performances are more rambling and spontaneous than the centred, spidery pattern charted in Inniskeen. Such a spatial awareness informs the 1952

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poem 'I had a Future,' a bitter-sweet reflection on Kavanagh's early days in Dublin:

> . . . Gods of the imagination bring back to life
> The personality of those streets,
> Not any streets
> But the streets of nineteen forty.
> [. . .]
> It is summer and the eerie beat
> Of madness in Europe trembles the
> Wings of the butterflies along the canal.[58]

Perhaps the spontaneity of urban space provided Kavanagh a place to reflect on the social realities plaguing Inniskeen. The 1936 census illustrated that southern Ireland contained the highest percentage of unmarried women and men in the world, with the incidence of late marriage, bachelorhood, spinsterhood and population decline most closely correlated to small farm holdings in regions such as south Ulster. After the Famine of 1847, 'keeping the name on the land, extending the farm if possible, and protecting it from encroaching or jealous neighbours was a local preoccupation'[59] in the region. Large 'family sizes found on comparatively small farms' resulting 'from the failure of older unmarried brothers and sisters to leave the parental home, made it impossible for any to marry. This phenomena 'increased in many south Ulster small farm communities in [the] thirties, forties and fifties.'[60] Published in 1942, *The Great Hunger* deconstructs the centred spatialities of Kavanagh's earlier life as a farmer-poet:

> 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.[61]

From Kavanagh's urbane perspective, the 'idyllic' chronotopes associated with his rural based writings are transformed, and chronotopes associated with 'peripherality' begin to emerge in his landscape depictions of Inniskeen parish. These *leitmotifs* convey a time and place 'lost in a cyclical, natural or static time-warp, forgotten by history, bypassed by history.'[62] Such a chronotopic shift in perspective is coloured by a sense of *topophobia*, and as Tuan notes 'we need to approach landscapes of fear, then, from the perspective of both the individual and the group, and to place them – if only tentatively – in a historical frame.'[63] By employing GIS in conjunction with Bakhtin's 'Historical Poetics' Kavanagh's literary and biographical landscapes become 'not only 'graphically visible' in space, but also 'narratively visible' in time.'[64] Kavanagh's spatial

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performances in Inniskeen parish (Figure 3) convey such a perspective; once a centering 'idyllic' pattern, it now conveys, when juxtaposed against his streetscape perambulations in Dublin (Figure 5) the 'cyclical' spatial pattern of an insular, and closed system, represented in *The Great Hunger*,

> The frosted townland of the night.
> Eleven o'clock and still the game
> Goes on and the players seem to be
> Drunk in an Orient opium den.[65]

The rural landscape in the Kavanagh GIS visualizations imply centrifugal movements in space, which appear rooted in a locus, but ultimately lead nowhere. In contrast, his Dublin streetscape peregrinations illustrate a centripetal tendency – which in a rural environment (such as the Ascendancy Big House culture of the early twentieth century) imply the decline, ruin and entropy of a society. However, in an urban milieu, centripetal movement lead to interactions with emerging nodes of culture; linkages with different networks of knowledge and new forms of thought and style. We can see from Figure 5, that a core space has been created by the collective dynamics of Kavanagh's urban pedestrian trajectories. Geographer Edward Soja has coined the word *synekism* to convey the 'stimulus of urban agglomeration,'[66] which this 'particular spatial dynamic'[67] imparts 'around a dominant and cetripetal core.'[68] Soja notes that *synekism* provides the 'context for active and affective processes of [...] innovation, development, growth and change.'[69] In the case of Kavanagh, GIS visualizations imply that such a *synekitic* shift in his spatial movement and environment, contribute to a commensurate chronotopic shift in the literary perspective he possessed towards the landscape of his native Inniskeen. To paraphrase Deleuze, after relocating from his native parish to Dublin, Kavanagh 'was no longer himself.'

<div align="center">CONCLUSION</div>

David Bodenhamer has identified two scenarios for Humanities GIS, which he envisions as the most fruitful employment of this technology in the discipline. Firstly, by 'locating historical and cultural exegesis more explicitly in space and time,'[70] applications of GIS in the humanities can aid in finding 'patterns,' facilitate 'comparisons,' enhance 'perspectives' and illustrate 'data.'[71] Secondly, Bodenhamer argues that GIS 'technology offers the potential for an open, unique post-modern scholarship, and alternate constructions of history and culture that embraces multiplicity, simultaneity, complexity and subjectivity.'[72] This paper's employment of GIS has attempted to incorporate both of Bodenhamer's scenarios in its scope and aim. In the first instance, it's application to the work

and biography of Patrick Kavanagh in conjunction with Bakhtin's 'Historical Poetics' illustrates the relevance of geo-spatial technology, visualization and analysis in furthering the epistemologies of literary and cultural studies. In the second instance, the employment of GIS and Web 2.0 methodologies on the *Digital Literary Atlas of Ireland, 1922–1949* project at the Trinity Long Room Hub strives to place commensurate scholarship within a cybernetic realm. As Bodehamer argues, data in the humanities is distinctly framed as 'logo-centric.' But GIS used in a human-cybernetic assembly platform with Web 2.0 applications and online digital portals, can provide mapping functions in a 'format and a metaphor with which humanists are conversant [...] making it possible to see the complexity we find in society and culture.'[73]

Following on this, the conceptualization of GIS as an 'abstract machine' in Deleuze and Guattari's terminology, for literary and cultural 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 abstract machine] diagrams it, carries it off, raises it to its own power.'[74] Such a function is 'the abstract machine's absolute, positive deterritorialization.'[75] From a Foucauldian perspective, the contrasting *topophilic/phobic* 'heterotopias' represented in Kavanagh's novel and epic-poem when 'spatially parsed' through this 'abstract machine' convey, counter and deterritorialize biographical and State 'enacted utopias' of Inniskeen parish, through idyllic, and apocalyptic chronotopic prisms.

The 'transcendental empiricism' practiced by Deleuze and Guattari informs us that a humanistic-technological interface constitutes the essence of 'diagrammatic or abstract machine,'[76] which 'is neither an infrastructure that is determining [...] nor is a transcendental Idea that is determining in the supreme instance.'[77] Instead, such and interface can play a 'piloting role'[78] which does not 'function to represent'[79] something real (as conventional empiricism does) but rather 'constructs a real which is yet to come'[80] (a transcendental empiricism). Deleuze and Guattari provide examples of other human-technological interfaces which can comprise the form and function 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 (defined precisely by an arbitrary line, called the adjunctive line, which conjugates with a body taken as a starting point), etc.[81]

GIS utilized within the instance of this paper is the technological component of a literary and cultural abstract machine which provides a digital means to

conduct spatial and historical analysis. As Stuart Aitken and James Craine observe, GIS is not only a 'technology of image making but, more importantly, it is a technology of information transfer and knowledge production'[82] and 'functions as an act of communication.'[83] They note that GIS is comprised of a 'chain of practices and processes through which geographical information is gathered [...] and imaginative geographies are constructed.'[84] Indeed, identifying and geocoding the actual terrains upon which the 'imaginary geographies' of J. R. Tolkien's hobbit trails in *Lord of the Rings*, or Richard Adam's rabbit treks in *Watership Down* are based, can utilize the GIS 'storyboarding' methods illustrated in this paper. Furthermore, the Joycean 'joggerfry' performed by Steven Daedalus and Leopold Bloom in *Ulysses*, the Parisian sites of Walter Benjamin's Arcades Project, as well as the strolls of Charles Baudelaire's *flâneur,* provide intriguing arenas for further spatial and literary analysis of history and place. Such mappings offer tantalizing possibilities for critical GIS cybernetic engagements.

Such capabilities, I argue, inaugurate a trend which mines the ambiguous archival space designated by the hypen which separates the epistemologies of 'modernity' and 'post-modernity.' Initial GIS practices embraced the Cartesian functions of the former, but can provide a scaffolding from which to launch journeys into the latter, and beyond. As Friedrich Nietzsche's *Genealogy of Morals* (1887) reminds us, 'the actual causes of a thing's origins and its eventual uses, in many cases become worlds apart.'[85] GIS conceptualized as an 'abstract machine' – a cybernetic assemblage with the practices of current humanities research, operationalizes the cultural applications of this technology far beyond our contemporary notions of literature, space and time.

END NOTES

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