

Mapping the English Lake District: A Literary GIS

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Abstract

To date, much of the work that uses Geographical Information Systems (GIS) to study human geographies applies a social science paradigm to quantitative data. There is a growing recognition of the need, however, to test whether GIS can be used to map out the qualitative 'data' provided by the articulation of subjective spatial experiences. This paper expands the conceptual possibilities opened up by the use of GIS technology through an exploration of the theoretical potentiality of literary GIS. Drawing upon work carried out as part of an interdisciplinary project, 'Mapping the Lakes', the paper focuses on the ways in which GIS can be used to explore the spatial relationships between, two textual accounts of tours of the English Lake District: the proto-Picturesque journey undertaken by the poet, Thomas Gray, in the autumn of 1769; and Samuel Taylor Coleridge's self-consciously post-Picturesque 'circumcursion' of August 1802. Alongside this text-specific focus, the paper also draws upon recent spatial literary criticism to reflect, more generally, upon the critical possibilities and problems associated with the digital mapping of the literature of place and space. Ultimately, the paper seeks to open up methodological and critical space for the ongoing development of literary GIS.

Key words literary studies; English Lake District; GIS; spatial theory; literary cartography; digital humanities

[. . .] mossy soft ground, every man his own path-maker – skip & jump – where rushes
grow, a man may go – (Coleridge 1957, 1207) ¹

A good map is worth a thousand words, cartographers say, and they are right: because it
produces a thousand words: it raises doubts, ideas. It poses new questions, and forces you to
look for new answers. (Moretti 1998, 3-4)

Introduction

In the 1990s, the scholarly use of Geographical Information Systems (GIS) was a site of dispute and contestation: for some practitioners and commentators, the emergence of this digital technology represented a new paradigm for geographical research (Openshaw 1991 and 1997); others, however, critiqued what they perceived to be the problematically positivist, and non-intellectual, practice of using GIS to map out quantitative data (Pickles 1995). Since the late 1990s, those early, and frequently vociferous, debates have been largely resolved by a movement towards critical GIS: a shift towards a form of digital map-making which is predicated upon processual self-reflexiveness and a conceptual sensitivity to the way in which GIS is inextricably embedded within the social space it endeavours to represent. Alongside this theoretical interrogation of GIS-based mapping practices, human geographers have begun to test the possibility that such technology might be used to explore subjective geographies through the spatial representation of qualitative, or ‘fuzzy’, data (Evans and Waters 2007; Cope and Elwood 2009). As a result, the use of GIS has become central to the characteristically disparate research of many geographers working with both quantitative and qualitative data.

Concurrently, the porosity of traditional disciplinary boundaries has been unconcealed as GIS has become increasingly incorporated within the spatially-focused research of scholars working in other subject areas. A cardinal field of development has been historical GIS (Gregory and Healey 2007; Gregory and Ell 2007; Knowles 2008a). To date, much of this work has primarily focused on quantitative sources in environmental history (Cunfer 2005), economic history (Knowles and Healey 2007) and historical demography (Gregory 2008). At the same time, there has been a growing recognition that historical GIS needs to incorporate a much wider range of qualitative sources and approaches, as evidenced by work on such diverse topics as medieval mapping (Lloyd and Lilley 2009), Chinese history (Berman 2005; Bol 2008), battlefields (Knowles 2008b), and the re-creation of rural and urban environments (Harris 2002 and Yano et al 2007 respectively).

Simultaneously, the rapid development of the field of digital humanities has reflected the growing acceptance of IT-based approaches to arts and humanities research (Schreibman et al 2004; Greengrass and Hughes 2008; Deegan and Sutherland 2009). GIS is making an increasingly vital contribution to the development of such digital humanities scholarship: recent key projects have involved the mapping of nineteenth-century performance spaces in Nottingham, the history of movie-going in North Carolina, and the geographies of popular music in Liverpool.² As a result, there is a move towards using GIS technology to highlight the imbricated relationship between the locatedness of everyday life and the spatialities of cultural practices. Yet, although a range of projects have begun to test the humanistic possibilities of GIS technology, there still remains a need for researchers across the arts and humanities to advance the co-existence of quantitative and qualitative GIS that can be located

within human geography. In addition to visualising the geographical sites of cultural experience, arts and humanities researchers might expand the use of GIS technology yet further by exploring its potential for mapping out artistic representations of spaces and places: a development which will, by extension, test the possibilities of the qualitative GIS by embedding the practice of digital map-making within the interpretative process. This paper is situated within the wider contexts of both critical and qualitative GIS as we seek to explore how such digital technology might be used to map out literary articulations of geographically-located dwelling and spatial mobilities. Crucially, however, the paper is also underpinned by the self-reflexive desire to use GIS technology as a tool for critical interpretation rather than mere spatial visualisation.

The English Lake District has been selected as the geographical site with which to begin testing the practical and conceptual possibilities of a scholarly literary GIS.³ The Lake District is a singular landscape of lakes and rocks, fells and tarns, crags and becks. It is also a seemingly circumscribed space for, as the twentieth-century poet, Norman Nicholson (1955, 76), puts it, the Lakes is an area ‘barricaded from the rest of Britain by mountain, marsh, and sea – the Border hills, the Pennines, the Solway, and Morecambe Bay’.⁴ The apparent boundedness of this environment offers a clearly-defined and mappable terrain. It is also a famously aestheticised landscape which can be claimed to be ‘as rich in literary associations as in natural beauty’ (Lindop 1993, 6). In other words, the spatial history of the Lakes is shaped by an inextricable interweaving of topographical singularity and artistic representation. This perceived exceptionalism can be traced back to the Picturesque visitors of the second half of the eighteenth-century: tourists who travelled to the north-west of England ‘armed with guidebook, sketchpad, Claude glass and sometimes camera obscura’

(Bate 2000, 127); outsiders who ventured into this seemingly sequestered space in self-conscious pursuit of pre-determined ways of seeing and responding to the landscape.

The decision to use the Lake District as the site for examining the conceptual and critical potentiality of literary GIS has been informed by two interconnected ideas: an awareness of the braided nature of the region's socio-spatial and cultural histories; and an understanding of this rural, touristic landscape as a repeatedly rewritten and imaginatively over-determined space. In order to begin testing the new methodological approach, it has been necessary, in the first instance, to constrict the focus by mapping out two Lake District texts: Thomas Gray's account of a tour of the region in autumn 1769; and Samuel Taylor Coleridge's documentation of a nine-day walking expedition in August 1802. Although both of these texts were written by figures whose poetry is securely situated within the canon of English literature, the two writers seem to offer articulations of contrasting spatial experiences and environmental attitudes. Gray's *Journal* can be located within the wider context of Picturesque tourism; whilst Coleridge's account can be read alongside the contemporaneous Romantic poetry of William Wordsworth as a self-conscious movement away from the aestheticisation of landscape promoted by the Picturesque. In the remaining space, this article will set out the methodologies that were developed in order to create a series of literary GIS before moving on to highlight some of the ways in which the processes of textual digitisation and digital map-making have served to open up thinking about the place-specific texts by both Gray and Coleridge. First of all, though, it is essential to position literary GIS within the conceptual framework offered by the 'spatial turn' across the arts and humanities.

The ‘spatial turn’: a theoretical context for literary GIS

Over the past fifteen years, literary critics – working across a range of generic forms, historical and cultural periods, and geographical locations – have explored both authorial and reader spatialities. That is to say, critics have examined the ways in which writers use texts to construct a sense of place; at the same time, literary scholars have addressed the ways in which readers respond to different representations of actual and imagined geographies. There is nothing revolutionary in this interweaving of the textual and the spatial: as Kerrigan (1998) points out, it is an interconnected relationship which can be traced back to the first century BC and Strabo’s defence of Homer’s geographical configuration of the world. The new spatial criticism, however, is defined by the overlapping strands of philosophical and theoretical discourses which literary critics have appropriated in an endeavour to facilitate further understanding of geo-specific creative writing; discourses which have enabled readers to unpick the deep-rooted complexities embedded within the literary representation of space and place.

As Kerrigan indicated, ‘there is much talk in English studies of “cognitive mapping”’ (1998, 3); and, over the past twelve years, the concept of ‘mapping’ practices has continued to provide literary critics with a helpfully malleable metaphor. A by-product of this semantic pliability, however, is that the endlessly recycled metaphor has been stripped of geographical meaning and the mapping of a literary text has too often become elided with the process of critical practice. In other words, ‘mapping’, in literary studies, has frequently become synonymous with a way of reading rather than cartography. As a result, there is a need to clarify our own exploration of the possibilities of literary GIS by ensuring that the discussion is anchored within the context of what Cosgrove (1999, 3) has defined as ‘the “cartographic

trope”): a ‘fashionable fascination’ with map-making, map-reading and the way in which the two-dimensional cartographical space both represents and moulds the conceptualisation of three-dimensional geographical space.

The practice of literary cartography can be sub-divided into two principal categories: writerly mapping, which refers to the ways in which an author explicitly explores the relationship between cartography and textuality; and readerly mapping, which denotes the ways in which an individual may recalibrate this relationship between textual and cartographical representations of geographical space through the reading process. Both of these categories contain multiple sub-divisions. Writerly mapping, for instance, may refer to the way in which actual maps have been integral to the spatial configurations and compositional processes of particular novelists and poets: from consideration of how the work of Colonel Mudge’s nascent Ordnance Survey shaped Wordsworth’s topographical understanding of his native Lake District; to reflection on the relationship between Auden’s adolescent fascination with maps and his adult reimagining of the lead-mining territory of the northern Pennines as a ‘sacred’ landscape; to interrogation of the way in which the streets maps of Belfast feed into Ciaran Carson’s contemporary poetic documentation of his home city (see, for example, Wiley 1998; Sharpe 2007; Alexander 2007). In such instances, maps can be understood to function as creative stimuli in that plane-surface cartographies demonstrably inform the writer’s sense, and representation, of spaces and places. Textual scholarship may facilitate further understanding of this relationship between writer, space, place, cartography and text, as a return to original manuscript material may offer critical insights into the role that maps played as a writer brought a particular text into being. Alongside this, writerly mapping may refer to the way in which an author deliberately incorporates cartographical representations of

space (either real or imagined) within his or her published work. The insertion of maps is a standard practice in travel writing and the guide book tradition; but evidence of this strategy of geographical authentication can also be famously found in much fictional literature (Defoe 1972; Tolkien 1968; Ransome 1993). A third use of the term, writerly mapping, might be to refer to the work of those writers who self-consciously challenge the distinction between cartographical and textual representations of space; those writers and artists who integrate both mapping and literary practices within a holistic poetics of place (Borodale 1999 and 2003).

Readerly mapping, on the other hand, may denote the way in which the individual reader moves between the cartographical and textual representations of space which have been brought together by the writer within the space of the codex: a process which can be illuminated further by turning to reader-response theory. At the same time, the term may signify how a reader may refer to other maps – situated beyond the textual space of the codex – during the reading process: the reader may turn to an online map, for example, in order to verify the geographical accuracy of a particular writer's documentation of a named location. Thirdly, and most saliently, the reader may choose to create his or her own maps based upon the reading of the literary text; he or she may make new maps in an attempt to expand his or her critical understanding and interpretation of the spatial writing.

In seeking to develop a methodology for literary GIS, then, our interests clearly intersected with this third type of readerly mapping; we were interested in using digital technology to make maps based upon our reading experiences. Further thinking about this type of readerly

map-making is opened up by the spatial criticism of Moretti and, in particular, the cartographical approach set out in his seminal monograph, *Atlas of the European Novel 1800-1900* (Moretti 1998). In his Introduction to the *Atlas*, Moretti proposes what he calls (perhaps rather loosely) a ‘literary geography’: a form of spatial criticism predicated upon the creation of readerly maps and, by extension, the use of those maps as ‘analytical tools’ (Moretti 1998, 3). For Moretti, the creation of maps facilitates conceptual thinking and allows the critic to ‘dissect the text, in an unusual way, bringing to light relations that would otherwise remain hidden’ (Moretti 1998, 3). Moretti’s map-making allows the critic to reveal the spatialised ‘*internal* logic of narrative’ (Moretti 1998, 5) and he plots the spatial patterns embedded within the representation of landscapes and environments across a range of nineteenth-century fiction. Clearly, Moretti’s process of literary map-making can provide a starting-point for the projected creation of digital cartographies. More particularly, Moretti’s development of a ‘literary geography’ can influence an understanding of the critical potentiality of literary GIS as he emphasises that the production of the literary map leads to ‘the most challenging part of the whole enterprise’: the need to look at the map and to think critically about what it shows (Moretti 1998, 7). For Moretti, then, the literary map ought to be conceived as contributing to an ongoing programme of spatial reinterpretation of geo-specific creative writing rather than as the end-product in a purportedly teleological process.

Moretti’s model of ‘literary geography’, however, is not without its conceptual and presentational problems and limitations. As Kerrigan (1998, 4) points out, Moretti’s pursuit of mappable data leads to a critical marginalisation of ‘the hidden chorologies’ or ‘the more intimate geographies of fiction’: complex social spaces, such as ‘gaslit alleys and boulevards’ and gendered domestic environments, which provide the settings for much narrative activity

but which are not easily charted with the use of geographical co-ordinates. Connected with this, there is a representational gap between the rigid two-dimensionality of Moretti's literary maps and the images of three-dimensional, embodied situatedness in place and movement through space which characterise much of the geographically-located creative writing which he investigates. This is a critique which corresponds with the thinking of the Italian geographer, Cerreti, who argues that Moretti's literary cartographies neglect the writerly articulation of the phenomenological experience of being-in-the-world through 'a Cartesian reduction of space to extension' (Moretti 2005, 54). According to Cerreti (1998), Moretti offers a model of 'literary geometry' rather than 'geography' (Moretti 2005, 54); the *Atlas* creates diagrammatic visualisations of relational spatial patterns but the maps fail to indicate how writers seek to encapsulate what may be described as the *genius loci* of particular locations.

For both Kerrigan and Cerreti, Moretti's mode of spatial criticism is undermined by an inherent tension: his 'literary geography' highlights the way in which a selection of novels play out complex and fluid spatialities and mobilities; yet his codex-based maps are both spatially and temporally fixed. Moretti's cartographies impose a single, stable analysis of geo-specific nineteenth-century fiction. As a result, the reader of Moretti's *Atlas* occupies a position of critical passivity when he or she is presented with fixed cartographies of the geographical locations at which the novels of Jane Austen begin and end (Moretti 1998, 12) or the way in which many of Dickens's characters inhabit liminal spaces on the periphery of the expanding city of London (Moretti 1998, 121). The notion that Moretti's maps restrict the possibility of active reader-response is reinforced by the fact that the spatial parameters of the codex means that Moretti's cartographies are divorced from the primary texts from which

they have been produced. In other words, there is a separation of the textual and cartographical representations of space which Moretti's novel methodology seeks to bring together.

'Mapping the Lakes' has been informed by questions as to whether the limitations of Moretti's methodology can be transcended, at least in part, by moving the practice of literary cartography into digital space. Can Google Earth, for instance, be used to represent spatialities and mobilities as well as the fixedness of bounded place? Does the movement into digital space open up an appropriately fluid environment for the presentational marriage of textual and cartographical representations of space? In the next section of the paper we set out how we endeavoured to make the transition from pure theory to theoretically-informed, self-reflexive praxis.

Literary map-making: geo-specific texts, GIS and Google Earth

The creation of the literary GIS of the texts by Gray and Coleridge involved a four-stage process: the texts were digitised; place-names were identified and tagged; co-ordinates were found for every geo-specific reference; and the resulting information was converted into a GIS (Gregory and Cooper 2010). Given the relative brevity of the accounts by Gray and Coleridge, the texts were digitised through manual typing: a process which allows the operator to identify place-names as they were typed and which, by extension, highlights the complex textual histories of both spatial accounts. Place-name references were tagged using eXtensible Markup Language (XML); additional information - including whether the writer clearly situates himself at named locations, people that are discussed, and editorial comments

- were also tagged. The tagged place-names were then extracted into a database table to allow co-ordinates to be added. This was executed by joining the references to the Ordnance Survey's (OS) 1:50,000 gazetteer: a table that provides a co-ordinate for every place-name marked on the OS's Landranger series of maps.⁵ These co-ordinates represent the location of the one kilometre grid square in which the named place is situated: a system of mapping which is sufficiently accurate for most topographical features, such as towns, villages and mountains, but which is more problematic for linear features such as rivers and the major lakes. Rectifying variant spellings and disambiguating different places with the same names was performed manually.

The resulting list of names and co-ordinates has then been read into ArcGIS to create a GIS layer for each tour.⁶ A map of the Lake District dating from 1815 has been scanned and geo-referenced to provide background information. Some subsequent analysis has then been performed in ArcGIS while a version of the system has been exported to Keyhole Markup Language (KML) format to be read into Google Earth: a process which is designed to provide a more user-friendly version of the GIS that could be easily disseminated over the internet; and a process through which the users are able to develop an understanding of the contoured nature of the Cumbrian topography through which both Gray and Coleridge travelled. At a technical level, then, the creation of a literary GIS has been relatively straightforward; the more significant challenge has been to identify methodologies for its use by spatial critics.

Re-reading Gray and Coleridge: the critical potentiality of literary GIS

In attempting to develop a methodology for literary GIS, we have tested how the literary map-maker might be able to use geo-technologies in increasingly sophisticated and exploratory ways. There are four main stages to the spatial narrative that we have used to structure our cartographical readings of the geo-specific texts by both Gray and Coleridge. On the first level, ‘base maps’ chart the respective writers’ embodied movement through time and space. ‘Analytical maps’ develop this methodology through the use of density smoothing techniques frequently employed to visualise quantitative geo-specific data. The third tier, ‘exploratory maps’, gestures towards the possibility of more abstract and subjective literary GIS through the creation of ‘mood maps’: cartographies which were created through the tabulation of the writers’ emotional responses to named locations. At the fourth and final level, ‘interactive maps’, Google Earth has been used to visualise the movements of both Gray and Coleridge through and across the Cumbrian landscape. At this tier the texts and maps are directly linked, allowing the user to move freely between literary and cartographical representations of regional space. In what ways, however, does the creation of these digital maps actually serve to reconfigure and recalibrate the spatial understanding of the two primary texts?

[Figure 1 near here – Base Map for Gray]

[Figure 2 near here – Base map for STC]

[Figure 3 near here – Comparative base map]

At the primary level, the respective base maps instantaneously illustrate the spatial distinctions between the two textual accounts. Figure 1 is a base map which charts Gray’s

1769 tour and highlights how the writer moved exclusively through the eastern half of the region; whereas Coleridge, in his 1802 walking expedition, focused on the more vertiginous, western fringes of the Lakes (figure 2). This neat longitudinal division of the regional landscape is clearly visible on the comparative map shown in figure 3.

The contrasting spatial emphases can be understood by positioning the two textual accounts within appropriate biographical and cultural contexts. The trajectory of Gray's journey was determined by his status as a touristic outsider. Gray initially attempted to undertake a tour of the region in the late summer of 1767; but that first expedition was necessarily abandoned when his travelling companion, Dr Thomas Wharton, was taken ill at Keswick. This relatively brief encounter with the Lake District landscape patently made a significant impression on the imaginative consciousness of Gray, who, in a letter to William Mason, described the aborted journey as 'charm'd' and vowed to return to the region 'at the first opportunity' (Gray 1971, 977). The tour of 1769, therefore, involved a self-conscious, pre-planned process of revisitation. In many ways, Gray can be framed as a proto-Picturesque eighteenth-century traveller: he carried a Claude-glass as he moved around the region; and, tellingly, William Gilpin comments that 'no man was a greater admirer of nature, than Mr Gray, nor admired it with better taste' (Gilpin 1800, vii). In his spatial, aesthetic and textual practices, then, Gray can be understood to have opened up imaginative space for the full development of the high Picturesque in the Lake District: a culturally-constructed mode of environmental perception which fully flourished in the mid to late 1770s. Yet Gray's *Journal* occupies a richly hybridist position within the spatial history of the Lakes as the text simultaneously anticipates, and moves beyond, the environmental aesthetics of the Picturesque. Gray's articulation of the multi-sensorial nature of environmental experience, for

example, differs from the principally visual mode of landscape engagement practised by high Picturesque writers and artists such as Gilpin and West (West 1778). In the words of Nicholson: ‘By his more exact observations, by his greater sensitivity to the personality of place, by his more sensual response to landscape, he advanced far beyond the visual æstheticism of Gilpin and foreshadowed the splendid understanding of Wordsworth’ (Nicholson 1955, 58-9). Yet, in spite of these rich complexities, Gray’s text unambiguously documents the spatial mobilities of the tourist. Significantly, as figure 1 shows, Gray’s tour was organised around overnight stays in the built environments of Penrith, Keswick and Kendal; these tourist bases provided the fixed geographical co-ordinates around which Gray’s regional travels were structured.

Coleridge’s walking tour of 1802, on the other hand, was shaped by the writer’s dual identity as environmental insider and post-Picturesque traveller. Coleridge first visited the Lakes in the autumn of 1799 when he and Wordsworth undertook a three-week walking tour of the region. In the following year, Coleridge relocated to the Lake District and moved his family to Greta Hall, Keswick. In contrast to Gray, then, Coleridge was an inhabitant of this region; he was a writer for whom this landscape of ‘cataract[s]’, ‘naked Rocks’ and ‘ruined sheep fold[s]’ (Coleridge 1957, 1207) had become the site of everyday being and dwelling. In addition to this socio-spatial insiderness, Coleridge was also seeking to explore new types of spatial practice; and, as a result, his 1802 tour appears to represent an eschewal of well-trodden touristic pathways in an attempt to map out a self-determined route through the wilder spaces of the western Lake District. In contrast to Gray, Coleridge deliberately avoided the region’s main villages and towns and, instead, focused on moving through, and staying within, the area’s more remote rural topographies: the ‘woody pleasant rough vale’ of

‘Wastdale’ (Coleridge 1957, 1213), for instance, and the valley of ‘Eskdale, more descriptively Eskerdales’ which appears to exist ‘by the reluctant Mercy of the mountains’ (Coleridge 1957, 1221).

The overarching spatial trajectories of the two journeys, as mapped out on the comparative GIS (figure 3), reinforce the notion that Gray and Coleridge offer contrasting portraits of spatial outsidership and insidership. Gray’s progress through the Cumbrian topography was characterised by linearity (with the exception of localised movements associated with day-tripping from his temporary base at Keswick); and the map shows how Gray moved into, around, and then back out of the regional space. Coleridge’s tour, in contrast, was defined by circularity and cyclicity: the GIS highlights how his route encloses and circumscribes space as his walking tour both began and ended at the family home in Keswick. Significantly, Coleridge refers to his 1802 tour as a ‘circumcursion’ (Coleridge 1956, 452): a characteristically Coleridgean neologism which opens up the possibility of psycho-spatial analyses and interpretations based upon notions of entrapment and boundedness.

This method of direct spatial comparison can be enriched further by turning to the use of a Digital Elevation Model (DEM) which allows the heights of each location mentioned to be calculated (Gregory & Cooper 2010 74). This process facilitates consideration of the verticality, as well as horizontality, of the respective tours and illustrates the differing nature of the writers’ spatial practices. 60% of Gray’s tour unfolds at sites situated below 100 metres in height: he walks along the banks of Ullswater and notes how the lake ‘nothing resembles that laid down in our maps’ (Gray 1971 1078); he passes ‘by the side of *Skiddaw* & its cub

call'd *Latter-rig*' (Gray 1971, 1079) as he heads into Keswick; and, when passing along the shore of Derwent Water, he looks down with botanical disappointment to find 'nothing but several curious Lichens, & plenty of gale or Dutch myrtle' (Gray 1971, 1096). He also frequently looks up at the high fells: 17% of the places he mentions, but does not visit, are located above 600 metres. In contrast, he generally ignores those intermediate vertical sites which are situated in-between the terrain across which he travels and the high peaks towards which he gazes: places between 300 and 600 metres account for less than 5% of the sites named in his account.

Coleridge's tour, however, offers a more even distribution across height ranges. As with Gray, Coleridge spends much of the journey at relatively low altitudes: 29% of the places he visits are at less than 100 metres in height. Significantly, though, 27% of the locations he claims to have visited are between 300 and 600 metres; and even more saliently, 11% are higher than this, illustrating how his embodied experiences included those at more than 800 metres. Coleridge's processual prose is characterised by a sense of the writer's physical progress up and down the Cumbrian fells: he ascends and climbs; he descends and falls. As with Gray, Coleridge regularly looks up to the Lakeland fells as he walks across the terrain; but, crucially, his spatial practices also enable him to view the landscape from positions of physical elevation: 'I pass along Scafell Precipices; & came to one place where I thought could descend, & get upon the low Ridge that runs between Sca Fell & Bowfell, & look down into the wild *savage, savage* Head of Eskdale' (Coleridge 1957, 1218).

Although the use of comparative mapping suggests that the two tours were characterised by spatial distinctiveness, there were also points of geographical intersection. Figure 3 highlights that there was a solitary, yet significant, line of overlap on the route between the town of Keswick and the village of Grasmere: Gray travelled down this road *en route* to the next destination on his itinerary; whilst Coleridge walked in the opposite direction in order to return to his family home. The single point of overlap immediately gestures towards the prominent role that this central route played, and continues to play, within the spatial history of the Lake District. What is more, this point of geographical intersection also draws attention to Coleridge's inability to undertake an absolute abandonment of familiar, well-trodden routes through the local landscape. Significantly, neither writer visits, nor mentions, sites in the far north of the regional space: the furthest north that Gray travels is to the northern end of Bassenthwaite Lake; and Coleridge tours exclusively to the south of his home at Keswick. The vast swathes of blank space upon the comparative GIS raises questions about the possible imaginative and cultural marginalisation of particular tracts of land within the Cumbrian topography: the expansive territory known as the Back O'Skiddaw (the Uldale and Caldbeck fells), for example; the unbounded space of the Solway Plain; or the liminal estuaries and peninsulas in the far south-west of the region. As a result, these comparative maps highlight how the literary map-maker needs to be alert to cartographical absence as well as presence; there is a need to be attentive to the way in which textual representations of space are united by their shared neglect of particular topographies.

[New figure 4 – smooth surface map for Gray]

[New figure 5 – smooth surface for STC]

These first-tier maps offer basic visualisations of the itineraries documented by both Gray and Coleridge. Dot maps, however, can be relatively difficult for the human eye to interpret and their representational limitations are widely acknowledged (Robinson et al 1999). To facilitate the GIS representation of the spatial patterns embedded within both texts, it is possible to turn to density smoothing: a quantitative spatial analysis technique pioneered in disciplines such as epidemiology to identify the geographical clustering of events (Bailey and Gatrell 1995). The technique functions through a smoothing of the pattern to indicate where many 'events' have occurred and, conversely, where few or no 'events' have taken place. Within the context of the literary GIS project, the 'events' to be mapped are the place-name references to be found in the respective texts (figures 4 and 5).

Coleridge's map (figure 5) is perhaps unsurprising in that the eye is drawn to a cluster located to the east of the head of Wastwater at a site where Sca Fell runs down into the vale of Eskdale. The identification of this place-name cluster corresponds with Coleridge's textual documentation of the descent of Broad Stand: a descent of a vertiginous precipice on Sca Fell which Coleridge famously introduces, in a letter to Sara Hutchinson (Coleridge 1956, 841), with the declaration that there 'is one sort of Gambling, to which I am much addicted'. Gray's density smoothed GIS (figure 4) is perhaps of greater interest in that the linearity of the touristic route becomes visually subsumed by a dominant spatial pattern clustered on urban centres. The system of gradation indicates that the geographical site at which Gray's place-naming was most prolific was the landscape in and around the town of Keswick: the town in which he spent a total of six nights. Crucially, the map also shows that there were

significant place-name clusters in the towns of Penrith, Kendal and, towards the end of his tour, Lancaster.

To return to, and to adapt, Moretti's maxim, the critical value of literary GIS resides in its capacity to prompt further spatial thinking about texts; and, in this particular instance, the cartographical process opened up space for further reflection on the act of place-naming. The creation of these maps drew our attention to Coleridge's greater predilection towards geo-specificity. This discrepancy can be understood, once again, by the outsider-insider dialectic which underpins the spatial distinctions between the textual accounts by Gray and Coleridge. Coleridge's habitual geo-specificity reflects his superior knowledge of the Cumbrian landscape: a familiarity with the region which was established with his first visit to the Lake District in 1799 and which was developed through quotidian spatial practice since his move to Keswick in 1800. At the same time, the Coleridgean practice of nomenclature may also be read in psycho-spatial and ideological terms. In one sense, the naming of places may be interpreted as a Wordsworthian desire for the imaginative appropriation of the local topography. That is to say, by naming even the most remote of rural locations within his writing, Coleridge endeavours to undertake figurative ownership of these material sites. What is more, the naming of places may correspond with what the ecocritic, McKusick, describes as Coleridge's imaginative preoccupation with the way in which place-naming is 'a key instance in which words are generated by complex interaction between the features of the landscape and the local residents' (McKusick 2000, 37). In other words, Coleridge's habit of place-naming is informed by an idealised celebration of the inextricable connectedness between the local landscape and its human inhabitants. It is a reading which can be supported by reference to another of Coleridge's Notebook entries: 'In the North every Brook, every

Crag, almost every Field has a name – a proof of greater Independence & a society more approaching in their Laws & Habits to Nature’ (Coleridge 1957, 579).

In this instance, the process of quantitative map-making has provided the foundation for further reflection on the geo-specific detail to be located within the texts by Gray and Coleridge; and, by extension, the process has raised important questions about what it means to give a name to a particular point in the wider landscape and what it means to incorporate that name within a textual account of spatial experience. Yet it must be acknowledged that the creation of the smooth surface place-naming GIS remains predicated on the tabulation and representation of quantitative information and is not founded upon a process of critical engagement with the primary texts. To draw upon the poststructuralist theory of Deleuze and Guattari (1987, 12), these outputs from the GIS offer ‘tracings’ rather than ‘mappings’. As James Corner (1999, 214) explains, Deleuze and Guattari set up a ‘distinction [. . .] between mapping as equal to what is (‘tracing’) and mapping as equal as to what is *and* to what is not yet. In other words, the unfolding agency of mapping is most effective when its capacity for description also sets the conditions for new eidetic and physical worlds to emerge’. The practice of the readerly map-maker, then, needs to progress from mere ‘tracings’ to ‘mappings’; instead of ‘propagat[ing] redundancies’, the literary GIS needs to ‘discover new worlds with past and present ones’ (Corner 1999, 214) rather than to reinscribe that which is already known and understood.

Our attempt to move from ‘tracings’ to ‘mappings’ has led to the integration of critical reflection within the map-making process and has led, in turn, to the production of what we

have labelled ‘exploratory GIS’ or ‘mood maps’. At this stage of the cartographical process, the ‘tracing’ of quantitative data has been replaced with the ‘mapping’ of the writer’s documentation of subjective or emotional geographies; we have sought to establish connections between particular places and the articulation of particular moods. Yet it has become clear that even the attempt to explore the critical and conceptual possibilities of this type of cartographical representation requires the aggregation of ‘mappable’ material or data. That is to say, in order to represent the experiences of place expressed by Gray and Coleridge, it has been essential to tabulate the writers’ adjectival response to specific locations within the Lake District. To facilitate comparison of the textual articulation of different geo-specific experiences, then, it has been necessary to construct a numbered continuum, or sliding scale, of adjectival/emotional responses to landscape and environment. The continuum begins (at number one) with those articulated spatial experiences which might be labelled as ‘unpleasant’ or ‘undesirable’: moves on to those which could be described as ‘adequate’ (three); progresses through examples of enjoyable and unthreatening landscapes; and climaxes with the heightened senses of ‘fear’ and ‘terror’ (ten) which lie at the heart of a sublime environmental engagement. The underlying principle is that the construction of this scale operates as a tool of critical differentiation which can then provide the basis for cartographical visualisation.

[Figure 6 – mood map for Gray]

[Figure 7 – mood map for STC]

The creation of this type of continuum is not unproblematic. Most saliently, the identification and mapping of key words and emotional tropes may lead to the distorting marginalisation of the complexities and inherent contradictions embedded within literary articulations of space and place. Also, there is a limit to the comparative potentiality of this kind of ‘mood

mapping': different continuums need to be constructed for mapping different texts as individual writers will draw upon their own idiosyncratic spatial vocabularies and will invest individual words and phrases with particular emotion and meaning. To be more specific, Gray's proto-Picturesque environmental language might privilege sublime experiences of fear and terror within the Lake District language; whilst Coleridge, in his post-Picturesque account of moving through the region, might use such terms but imbue them with singularly nuanced meanings.

Yet, in spite of these anxieties, the creation of 'mood maps' opened up space for the production of GIS based upon the close reading and critical analysis of geo-specific texts. One way of testing the interpretive potentiality of this readerly mapping was to compare different mappings of the same text rather than to compare mappings of texts by different writers. As figure 4 shows, the place-naming centre of Gray's *Journal* is the tourist town of Keswick. Figure 6 illustrates, however, that the emotional centre of his 1769 tour was not an urbanised space but was, instead, the valley of Borrowdale: a landscape which presents Gray with, amongst other environmental experiences, 'the most delicious view, that my eyes ever beheld' (Gray 1971, 1079). It is here – in this enclosed, vertiginous rural space – that Gray experiences his most emotionally-heightened environmental response to place: he passes beneath '*Walla-crag*, whose bare & rocky brow, cut perpendicularly down above 400 feet, as I guess, awefully overlooks the way' (Gray 1971, 1079); he looks up to 'the jaws of *Borodale*, with that turbulent Chaos of mountain behind mountain roll'd in confusion' (Gray 1971, 1079); he witnesses the '*Lodoor* water-fall' and the way in which 'the stream was nobly broken, leaping from rock to rock, & foaming with fury' (Gray 1971, 1080).

The Coleridge qualitative mood map (figure 7), by contrast, reinforces the quantitative place-naming GIS (figure 5) by suggesting that the emotional centre of his 1802 walking tour was the area around Scafell: ‘I creep down beside that [beck] nearest Scafell – it runs at a huge chasm, its sides perpendicular of solid rock, in many places 50 high/the breadth never more than 15/in a storm this would be a famous Scene indeed/but O Scafell, thy enormous precipices’ (Coleridge 1957, 1218). At the same time, the Coleridge mood map highlights a secondary area of interest in and around the more northerly valley of Buttermere: ‘I never beheld a more glorious view of its kind – I turn & look behind me/what a wonderful group of mountains’ (Coleridge 1957, 1207). In addition, this GIS also draws attention to Coleridge’s relative lack of emotional or imaginative engagement with the areas through which he moves in the far west and south of the region.

The fact that the mood maps have been produced through critical engagement with the texts points towards future developments in literary GIS: developments which might be facilitated by drawing upon the evocatively experimental mapping practices gathered by Harmon (2004), and Abrams and Hall (2006). In other words, it is vital for the literary critic to draw upon the innovative strategies of the creative cartographer in order to explore new ways in which GIS might be used to map out the imbricated relationship between writer, place, text and reader. Yet the mood maps shown in figures 6 and 7 remain static: a sense of fixity which fails to convey the sense of physical movement articulated by both Gray and Coleridge. They are also self-contained in that they do not allow the user to move freely between maps and texts.

[Figure 8 – Google Earth]

These limitations were addressed at the fourth tier of the mapping process in which Google Earth was used. At the previous three levels, the primary texts are marginalised as the focus rests exclusively on map-based abstractions; at the fourth tier, however, it is possible to explore texts and maps immediately alongside one another. As shown in figure 8, the screen is divided into two parts. The top half presents the Cumbrian landscape as represented in Google Earth with points highlighting locations named in the texts; in addition, a historic map can be draped over the digital landscape in order to provide a contemporaneous cartographical representation of the Lakes. The lower half of the screen presents the texts. This on-screen split structure moves beyond the fixity of Moretti's codex-based critical map-making as the reader becomes an active user in that he or she is offered the possibility of approaching the spatial subject matter from one of two interlinked perspectives: he or she can use the map as a starting-point to explore the writers' descriptions of particular locations; alternatively, he or she is able to undertake a linear movement through the texts, following the geo-specificity of the unfolding spatial narrative in the accompanying map window. This system of presentation clearly opens up the opportunity for the user to create his or her own route through both cartographical and literary representations of space.

This fourth tier also allows us to move literary GIS away from the two-dimensionality of conventional plane cartographies and into the two and a half dimensional contoured landscapes represented in Google Earth. That is to say, Google Earth offers a rotatable representation of space which facilitates the virtual reconstruction of the writers' embodied movement through the regional environment. The user is thereby able to develop a greater sense of the nature of the territories across which Gray and Coleridge moved; and a reader unfamiliar with the topography of the Lake District is able to develop a further understanding

of the key distinctions between the (horizontal and vertical) spatial practices of Gray and Coleridge. The use of Google Earth thereby allows literary GIS to move towards ‘a kind of kinetic cartography’ (Cosgrove 1999, 6) of geo-specific writing.

The future of literary GIS: problems and possibilities

Ultimately, there are limitations to the literary GIS model suggested by the ‘Mapping the Lakes’ project. The straight-line methodology of linking place-name references on the Google Earth cartographies created a misleading visualisation of the historical movement of the respective writers through the Lake District landscape. A more fundamental problem is connected with literary genre as the critical potentiality of digital map-making was tested through the mapping of two accounts of actual journeys through the Lakes. Although both Gray’s *Journal* and Coleridge’s tour raise significant questions regarding the relationship between visited places and imagined spaces, the conceptual possibilities opened up by a literary GIS need to be explored through the cartographical representation of examples of geo-specific creative writing.

Yet, although these limitations and problems need to be acknowledged, it remains possible to identify how the ‘Mapping the Lakes’ project has opened up space for further literary cartographies. The project has highlighted the need for two contrasting, but intersecting, scales of literary GIS: cartographies which may be described as micro- and macro-mapping. Micro-mapping will highlight a writer’s engagement with, and representation of, the minute particularities of a landscape: a focus on localised geographies which will require detailed critical engagement with the geo-specificity of the primary texts. The production of micro-

cartographies will necessarily require more creative approaches to the mapping of the writer's movement through space and, perhaps, hand-held Global Positioning Software (GPS) could be used to document the physical retracing of a writer's journey through a particular landscape and environment. This in-the-field map-making would enable the literary critic to draw upon, and to adapt, the methodological strategies employed in other disciplines, including, for example, recent work on estimating historical routes in the United States (Dobbs 2009). More specifically, it would provide a digital dimension to a spatialised strand of literary biography which has become especially prominent within Romantic studies: the embodied and imaginative retracing of a writer's physical movement through geographical space (Holmes 1985; Hankinson 1991; Sinclair 2005).

At the same time, one of the great strengths of literary GIS may lie in the digital mapping of significant numbers of primary texts, as exemplified by the 'Vision of Britain' project (Southall 2006). This macro-mapping will allow the literary critic to identify large-scale spatial patterns and to visualise how the representation of particular places and spaces may have shifted over time. Within the singular context of the Lake District, macro-mapping may allow the spatial critic to explore how specific sites, such as Wordsworth's vale of Grasmere, have become imaginative 'hot-spots' whilst other locations occupy peripheral positions within the cultural history of the region. Macro-mapping, then, will assist the development of a further understanding of what may be termed spatial intertextuality: the way in which landscapes have been rewritten over time. To draw upon terms which Corner (Corner 1999, 235) uses to describe the cartographical practices of urban planners and architects, the multiple 'layering' of geo-specific literature may highlight how particular locations have become imaginatively 'thickened' through the process of re-representation.

It is possible to conceive further ways in which digital mapping could facilitate the work of the spatial critic. Digital space provides an open-ended environment for both the marriage of texts and maps and the presentation of a range of textual sources. As a result, digital space is a fluid environment in which manuscript material can be mapped and conceptual issues relating to textual spatiality can be explored alongside the interrogation of the literary representation of geographical space. In 'Mapping the Lakes', the need to create a mappable digital version of Coleridge's 1802 tour necessarily involved the construction of a composite text: the on-the-spot environmental notes which Coleridge recorded in a pocket-book were brought together with a series of self-dramatising letters written to Sara Hutchinson. Further research, then, might involve the use of GIS technology to offer layered mappings of these intersecting spatial texts; and, by extension, literary GIS, could, and should, allow the literary critic to conflate the 'literary geography' (Moretti 1998, 3) of Moretti with the theoretically-informed praxis of textual digitisation proffered by McGann (McGann 2001). Digital cartography may also provide an appropriately unfixed medium for representing, and interrogating, the relationship between the constituent elements of Lefebvrian 'social space' (Lefebvre 1991, 1). For example, the use of GIS technology may facilitate further understanding of the way in which the socio-spatial history of the Lake District has been, and continues to be, shaped by an inextricable interweaving of the geographical, the political and the imaginative. Finally, the literary GIS may also have significant pedagogical potential, providing an accessible space in which students can further their conceptual and critical understanding of geo-specific writing through active engagement. Ultimately, then, the literary GIS should be placed within what Mark Nunes describes as the open-ended 'topographies of cyberspace' (Nunes 2006, 48) and should be structured in such a way that

allows the user to make his or her own path, to paraphrase the Coleridgean epigraph to this paper, through both textual and cartographical representations of space.

In this paper, we have attempted to introduce the work that we carried out on 'Mapping the Lakes' and to stimulate further thinking about the methodological and conceptual possibilities of literary GIS. However, there is a need to remain alert to the fact that the principal work of the literary critic should be to offer new spatial readings of the literature of landscape and environment; and that, as a result, the critical reflection on, and interpretation of, the GIS that we have produced remains an ongoing project. As Moretti puts it in the *Atlas of the European Novel*: 'Placing a literary phenomenon in its specific space – mapping it – is not the conclusion of geographical work; it's the beginning. After which begins in fact the most challenging part of the whole enterprise: one looks at the map, *and thinks*' (Moretti 1998, 7).

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Figure 1: Base map of Gray's tour in 1769. The map shows all places Gray names in the text and indicates whether he was visiting the place when he mentioned it. The line showing the route is a straight line joining places that Gray visited in the sequential order in which they are mentioned in his text. No attempt has been made to map the actual route followed. Numbered places show where he starts each day of the tour. Day 1 was the 30th of September; Day 12 the 11th of October. The county boundaries shown pre-date the 1974 reforms.

Figure 2: Base maps of Coleridge's tour in 1802. Day 1 is the 1st of August; Day 9 the 10th.

Figure 3: Comparative base map of both tours.

Figure 4: Analytic map of Gray's tour. Density smoothing has been used to highlight clusters of place-name references.

Figure 5: Analytic map of Coleridge's tour.

Figure 6: Mood map for Gray's tour. Emotional responses to places have been ranked from 1, for example unpleasant, to 10, sublime.

Figure 7: Mood map for Coleridge's tour.

Figure 8: Screen shot from Google Earth showing an interactive map. The example shows a part of day 4 of Gray's tour. The bottom half of the screen contains part of the text in which he describes his visit to the banks of Derwent Water with place-names highlighted. The top half shows a map which identifies a location for 'Carf-close-reeds.'

Notes

¹ This quotation is taken from the Notebook that Coleridge used to document his experiences of moving through the Lake District landscape, alone, in the summer of 1802: one of the seventy pocket-books that he kept during adulthood, most of which are now held in the British Library. When editing the fragmentary Notebooks, Coburn imposed a chronological structure on the thousands of entries that Coleridge made over the course of his life. As a result, the reference (1207) given parenthetically in the text refers to Coburn's numbering of the individual Notebook entry rather than a conventional page number.

² See the following projects: 'Mapping Performance Culture: Nottingham 1857-67' (<http://www.nottingham.ac.uk/mapmoment> accessed 4 May 2010); 'Mapping the City in Film' (<http://www.liv.ac.uk/lisa/cityinfilm/index.html> accessed 4 May 2010); 'Going to the Show' (<http://docsouth.unc.edu/gtts/> accessed 4 May 2010) and 'Popular Musicscapes' (<http://www.liv.ac.uk/ipm/research/musicscapes/index.htm> accessed 4 May 2010).

³ For more information on the Mapping the Lakes project see: <http://www.lancs.ac.uk/mappingthelakes> (accessed 4 May 2010). This site makes use of the colour and interactivity provided by the internet to place the texts in their spatial and cultural contexts.

⁴ Throughout this paper the term 'Lake District' will be used to refer to a fluid geographical space which extends beyond the boundaries of the twenty-first century National Park (Cooper, 2007, 100-137).

⁵ This is available from the Digimap service at EDINA (<http://digimap.edina.ac.uk/gaz-download/GazetteerFullDownload.jsp>) Accessed 15 January 2009.

⁶ ArcGIS is a widely used GIS software package developed by Environmental Systems Research Institute (ESRI). See <http://www.esri.com> (accessed 22 June 2009) for more details.