LITERARY GEOGRAPHIES

The Conceptual Structure of Ossianic Space

Michael Gavin

University of South Carolina

Eric Gidal

University of Iowa

Abstract:
This article describes computational methods for representing Ossianic space by building and analyzing a network of place names. We explore the fraught attempts by eighteenth- and nineteenth-century travelers, antiquarians, and statistical geographers to map James Macpherson's controversial 'translations' of Gaelic myths onto the landscapes of a rapidly industrializing Scottish archipelago. To study these Ossianic geographies is to study how two modes of spatial discourse combined to produce a sense of Scotland as a modern, administered state, as a site of history, and as a repository of forgotten antiquity. We argue that such literary geographies are structured topologically, rather than topographically. Each link in the network represents a qualitative statement in the historical record that identifies a relationship of correspondence, containment, or proximity between two places. In this model, ancient and mythical places exist among others within a common conceptual frame. Because some of the nodes in the network can be mapped, all nodes become connected, however indirectly, to the spaces of Scotland's official geography, making it possible to speak and write across Scotland's otherwise distinct spatial modalities.

Keywords: Spatial Humanities; Ossian; James Macpherson; Qualitative Spatial Reasoning.

Author contact: mgavin@mailbox.sc.edu; eric-gidal@uiowa.edu

James Macpherson's Ossianic poetry sparked a world-wide cultural phenomenon. His two full epics *Fingal* and *Temora*, alongside a host of shorter narratives, songs, and elegiac laments published in the 1760s inspired new attention to oral and vernacular traditions across Europe, the Atlantic world, and the Indian subcontinent (Gaskill 2004; Bär and Gaskill 2012; Mulholland 2013). From the time of first publication, they generated an extended controversy, as many writers cast almost immediate doubt on both their antiquity and their provenance, suggesting that Macpherson had taken scraps of Gaelic ballads of primarily Irish origin and weaved them into a neoclassical apparatus of almost entirely his own creation (Trevor-Roper 2008; Curley 2009). In the context of the Highland clearances following the Jacobite rebellions of 1715 and 1745 and the subsequent consolidation of land ownership and industry across Scotland, contests over philological evidence, aesthetic merit, or authorial credibility often became surrogates for anxieties over political identity and economic restructuring (Trumpener 1997; Davis 1998; Weinbrot 2007). The very question of 'authenticity' raised by these poems concerned not only measures of formal continuity or cultural patrimony but also contests of political, economic, and social transformations.

These contests found recurrent expressions through competing languages of place. Almost every published tour of the Scottish Highlands, from those of Thomas Pennant, Samuel Johnson, and James Boswell in the later eighteenth century to the Wordsworths and Sir Walter Scott in the nineteenth, produced what Paul Baines has termed 'Ossianic Geographies' and Nigel Leask 'Fingalian Topographies' (Baines 1997; Leask 2016; Leask 2020). Scholars have understood these writers as participants in political and cultural debates over sovereignty and heritage in a globalizing British imperial system (Manning 2007; McLane 2008). We have presented this material in previous publications as constituting a nascent ecological perspective on literature's relation to a changing environment (Gidal 2015a), a mapping of telegraphic communication (Gidal 2015b), and a literary corpus amenable to methodologically innovative exercises in geospatial textual analysis (Gavin and Gidal 2017). In the early nineteenth century, a pair of particularly ambitious publications by the Highland Societies of Scotland and London combined Gaelic philology and historical geography in a bid to settle questions of poetic authenticity through methods of textual triangulation between Ossianic myth, official geography, and physical landscape.

In what follows, we will argue that this act of spatio-textual triangulation exemplifies two phenomena recently theorized in the field of literary geography: James Thurgill and Jane Lovell's 'spatial hinge' and Sheila Hones's 'interspatiality' (Thurgill and Lovell 2019; Thurgill 2021; Hones 2022a). Both concepts aim to clarify how literary experience permeates the world of geographical processes. For Thurgill, the "spatial hinge" represents "a process which extends a reading (and with it the text itself) into places previously unassociated with the text," such that the text "come[s] to be experienced by readers as fundamental parts of its literary landscape" (Thurgill 2021: 153). In that process, Thurgill and Lovell argue, "actual-world places shift from shaping the reading of the text to being shaped by the reading of the text" (Thurgill and Lovell 2019: 18). Hones further enriches

this notion by layering it with textual multiplicity. The texts that readers extend onto a landscape cannot be considered in isolation; instead, they are bound together by intertextual relations. The concept of interspatiality "nam[es] and enable[es] engagement with the dynamic plurality of texts, spaces, places, authors, readers and other agents" (Hones 2022a: 17). Under this framework, place is no longer simply the referent of the text, nor a location where texts are produced or read, but a principle of connection between texts that share geographical associations. Interspatiality thus offers a geographical perspective on intertextuality and a textual perspective on geography. As Hones argues, a 'text is not just the product of geographies, or the representation of geographies, but is in itself something spatial and geographical' (Hones 2022b: 137). The sense of place can be understood to be 'constructed as a mosaic of quotations… [through] the absorption and transformation' of other texts and other places, to adapt Julia Kristeva's famous account of intertextuality (Kristeva 1966 [1986]: 27). At the same time, place operates as a binding force – a *hinge* – across which various texts are combined by readers into geospatially relevant intertexts. Whenever any text is associated with any place it becomes connected as well to all other texts associated with the same place.

In this way, we borrow the concepts of 'interspatiality' and 'the spatial hinge' but we also adapt them. For Thurgill and Lovell, the spatial hinge refers specifically to instances where a reader associates a text with a place, even though that place is not mentioned in the text. We will relax this requirement and adopt an agnostic attitude toward referentiality. For us, a hinge is created any time a reader associates a text with a place *whether or not the place is specifically mentioned*. This conceptual broadening is necessary because within the debates over Ossianic geography, the question of whether a place is or is not actually mentioned in the text is precisely what's at issue. We further believe that this broadening of the spatial hinge offers a new perspective on interspatiality. Readerly associations between texts and places are radically flexible and can traverse various spaces. A place mentioned in Ossianic poetry occupies several spaces simultaneously, including spaces of cartography and modern administrative territoriality, as well as of myth and ancient history. We will argue that the spatial hinge, conceived in this way and modeled as an intertextual link among texts, can be usefully seen as the basic building block of interspatiality and therefore key to understanding the textual production of spatial experience in general. We refer to these intertextual and interspatial processes as the *conceptual structure* of space.

This exciting theoretical advancement also promises to open new approaches within the related field of spatial humanities, where scholars have sought more creative ways to represent narrative space computationally (Lang 2014; Presner et al. 2014; Railton 2015; Anderson 2016; Murrieta-Flores and Howell 2017; Tenen 2018; Giordano and Cole 2018). In their recent study, Bushell et al. (2021) present an elaborate XML schema for representing 'a topology of literary space' while leaving open the possibility of incorporating a 'referential layer for real-world geography' (16). We will argue that the theory of interspatiality suggests a useful framework for describing how these kinds of spaces interact with each other.

Our analysis will focus on a collection of documents that perform interspatial connections across Ossianic poetry, chorographical description, and cartography—texts that narrate the experience of the spatial hinge as writers variously claim: *the actions of this poem happened here*. The spatial hinges that bind poems and places together can be traced through qualitative statements like these about equivalence, connection, proximity, and overlap. In the latter part of this essay, we will describe a network model that translates such statements for computation, formalizing relationships among Scotland's various interspaces and providing a measurable proxy for the spatial hinge by identifying every instance where a reader associates a text with a place. Approached this way, the boundary that separates 'literary space' from 'real-world geography' largely disappears, because geographical and fictional toponyms exist together discretely in the corpus, much like any other concepts. Considered in aggregate, we are able to show how 'literary' and 'real-world' places became intimately connected to each other as Scottish writers mythologized their landscapes. Put simply, the Ossian controversy was an extraordinary "spatial event" in the history of Scottish literature (Hones 2008). At this transformative period in economic and literary history, inquiries into the authenticity of Macpherson's Ossianic poetry produced a set of experiments that provide a compelling case study for literary geographers and an early predecessor to their work.

Qualitative Spatial Reasoning

Outside the humanities, in the fields of geography, psychology, linguistics, and artificial intelligence, a great deal of research has been devoted to understanding the representation of space in language. Central to this line of research is a distinction between the world as it looks on a map and the world as represented and perceived in language. Recognizing this distinction calls scholarly attention to various forms of spatial representation, because how people perceive their world affects how they describe that world. As early as 1913, C. C. Trowbridge described the importance of 'imaginary maps' for wayfinding travelers, contrasting the 'ego-centric' model of space that situates the individual in relation to abstract coordinates (north-east-south-west) and a 'domi-centric' model that locates all positions in relation to the starting place, the domicile, or the home (Trowbridge 1913: 888-89). Trowbridge identified the first with 'civilized man' and the latter with 'primitive man,' a distinction central to the critical reception of Ossian and one that would be picked up by anthropologists and philosophers over the following decades. In *Philosophy of Symbolic Forms* (1925), Ernst Cassirer contrasted the 'logical space of geometry' from both '*mythical* space and *perceptive* space,' which, he believed, 'are thoroughly concrete products of consciousness':

> Here the distinction between position and content, underlying the construction of 'pure,' geometric space, has not yet been made and cannot be made. Position is not something that can be detached from content or contrasted with it as an element of

> independent significance; it 'is' only insofar as it is filled with a definite, individual sensuous or intuitive content. (Cassirer 1955 [1925]: 84)

On one side is the space of geometry and of the map, but on the other is 'organic space, the *space of action*' (Cassirer 1944: 43). However, to make this distinction explicit is already to begin imagining how its terms might be conflated. This divide created a new challenge for geography as a discipline: to describe the relations between these kinds of spaces, which though analytically distinct were nonetheless obviously related to one another in actual practice. Kevin Lynch's *The Image of the City* (1960) included three detailed case studies that combined interviews, questionnaires, maps, and photographs to uncover the imaginary geographies of Boston, Jersey City, and Los Angeles. Lynch's goal was to improve city planning by developing a better understanding of the 'environmental image' – that is, 'the generalized mental picture of the exterior physical world that is held by an individual' and used for way-finding and meaning-making' (Lynch 1960: 5). What earlier thinkers like Trowbridge and Cassirer cast as a stadial division between primitivism and modernity had come to be seen, by the 1960s, as a fundamental condition of geographical experience as such. To understand the meaning of maps required understanding their relation to the spaces of action and thought.

This line of inquiry was pursued separately in different disciplines. In cognitive linguistics, 'spatial semantics' examines how concepts of time and space are rendered in words. Such research tends to focus in particular on how nouns are organized by prepositions (Talmy 2000 [1983]; Tyler and Evans 2003; O'Keefe 1996; Bennett 1975). Sentences like 'The cat jumped over the table' represent space very abstractly. They provide a highly schematic picture with few details concretely specified. We're not told how high the table is, for example, nor at what angle the cat jumped. Leonard Talmy defines 'schematization' in spatial language as the 'systematic selection of certain aspects of a referent scene to represent the whole' (Talmy 2000 [1983]: 177). '[A]t the fine-structural level of conceptual organization', Talmy argues, 'language shows greater affinity with topology' than with geometry (233). According to Andrea Tyler and Vyvyan Evans, 'Only a tiny fraction of all possible spatial relations are coded by discrete lexical items' (Tyler and Evans 2003: 57). As a consequence, they explain, 'the principles of Euclidean geometry do not hold at the level of conceptual structure' (Tyler and Evans 2003: 58). They continue, '[c]onceptualized space and spatial relations are not held to be metric notions of fixed distance, amount, size, contour, angle, etc. Rather conceptualized space and spatial relations are topological in nature' (58).

As a result, the study of human geography necessarily involves the study of geographical relationships not measurable in terms of distance and therefore without the associated attributes of scale or shape:

> [M]ental representations of the geographical world are not stable, map-like entities that can be consulted as maps can be viewed. Rather, they seem to be constructed for a particular goal, drawing from the multiple sources of scattered information

> available those bits of information that seem relevant. ... This schematization of the geographical world provides a framework for integrating information from different sources, modalities, and occasions. Like all schematizations, it also simplifies the complex and categorizes the continuous, allowing distortions as well as integration. (Mark et al. 1999: 762)

Thus, whereas traditional cartography is concerned, first and foremost, with the geometrical shape of the earth and its landforms, scholarship under a paradigm of spatial relations would ask instead: 'How do people interact with multiple modalities and multiple frames of reference? How do they integrate and reconcile the varied information, if and when they do?' (Mark et al. 1999: 762). The schematization of space that occurs in language is neither true nor false – neither real nor imaginary – but rather should be understood as a key feature of space's social production and human realization.

These insights were also pursued in the computer sciences, especially in geographical information science and robotics, where a major research field is devoted to identifying the topological connections between abstract geographical statements in natural language and the physical objects to which they refer. At its most general, this line of research is known as 'Naïve Geography,' defined by Max Egenhofer and David Mark as 'the field of study that is concerned with formal models of the common-sense geographic world' (Egenhofer and Mark 1995: 1). Such work 'requires methods that will allow the transformation of quantitative geospatial data into the sorts of qualitative representations of geospatial phenomena that are tractable to non-expert users' (Tambassi 2017: 358).

In practice, this means teaching computers to understand the language of space; that is, to understand spatial relations that exist among objects independently of their distribution in the three-dimensional physical space of the world. For example, the theoretical framework of Kevin Lynch's *Image of the City* was picked up by computer scientist Benjamin Kuipers, whose 1977 dissertation designed an algorithm, which he called the TOUR model, for automatically generating directions to navigate between points on a map (Kuipers 1977: 24-25). We now take it for granted that computers can provide instructions to go from 'Broadway and Prospect Street' to 'Putnam Circle' (to borrow an example from Kuipers), and we are used to seeing such instructions highlighted as overlays on digital maps in smartphones and GPS devices. However, that familiarity should not blind us to the fact that these are two very different kinds of spatial knowledge. One is a chart that plots the city's roads within a Cartesian frame; the other is a database that describes objects in relation to each other and to the paths that connect them. To provide directions from one place to another or to train a robot to navigate a factory floor, the computer needs more than a map; it also needs something like a *mental* map.

For this reason, computers require a representation of spatial knowledge very similar to the 'schematization' linguists find in natural language. This need goes beyond route-finding and robotics but points to even the most basic operations of geographical information systems. Although digital humanists often focus their attention on the ability of GIS software to generate visual maps, such systems are databases that can be queried,

and such queries necessarily take a form designed to 'mimic' natural language (Egenhofer 2015: 153). In their classic paper on qualitative spatial reasoning, Egenhofer and Franzosa suggest this as an epitomizing example of the spatial questions GIS programs must answer: 'Retrieve all toxic waste dumps which are within 10 miles of an elementary school and located in Penobscot County and its adjacent counties' (Egenhofer and Franzosa 1991: 161). Questions like these combine measures of Euclidean distance ('within 10 miles of an elementary school') with topological relations like containment and adjacency ('located in Penobscot County and its adjacent counties'). In the 1970s and 1980s, such relationships needed to be encoded separately and uniquely for every system and every space. Egenhofer and Franzosa's innovation was to develop a general model for describing these relationships, called the '9-Intersection' model (See Figure 1). Given any two regions, *A* and *B*, the model specifies whether they *are disjoint*, *touch*, *are equal*, and whether one is *inside*, *covered by*, or *overlapping with* the other. Applying basic principles of point-set topology and contact algebra allows computers to generate spatial inferences to return appropriate responses to complex queries, even if the answers weren't uniquely encoded ahead of time (Ivanova 2019).

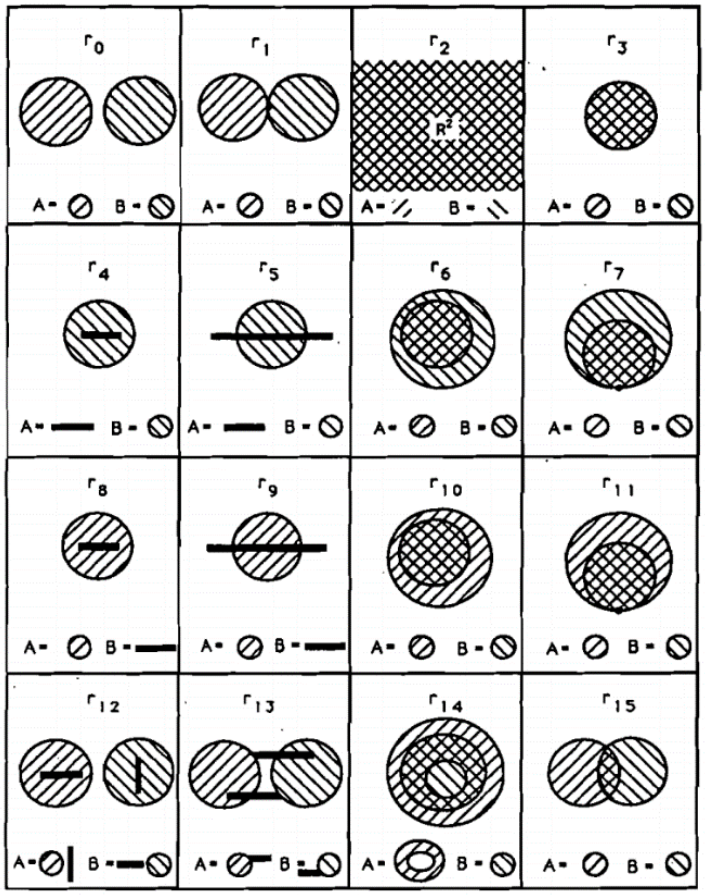

Figure 1. 'The 9-Intersection Model of Qualitative Spatial Relationships.' From Max J. Egenhofer and Robert D. Franzosa, 'Point-Set Topological Spatial Relations' (1991).

Though not visualized on any map, such relationships are spatial and geographical. They are indifferent to scale, shape, or measurement, but still have spatial structure – places can be in or adjacent to other places without their locations being specified. In such cases, the relationships are not vague, they are simply not subject to measurement: they're *topological*, not *topographical*. Qualitative spatial reasoning is based in language and therefore organizes space into schematic networks of places and regions, drawing connections among them and charting paths through them. In this way, geospatial topology provides a conceptual "hinge" between the space of language, where objects are discrete nameable things situated in relation to each other, and the space of cartography, where objects are represented along geo-coordinates.

Further, because they are based in natural language, topological relationships can be encoded whether or not they are objectively true — whether they are part of a place's official or naïve geographies. Myths and fictions permeate the 'environmental image' of Scotland (to return to Kevin Lynch's phrase). Where Egenhofer and Franzosa trained computers to interpret queries about features in a GIS dataset, we will argue in the next section that Macpherson and his later defenders deployed analogously topological reasoning to produce a discourse of place that moved across historical and ontological registers. In a remarkably prescient sequence of textual maneuvers, these authors established networks of intertextual relations that simultaneously valorized Gaelic traditions and affirmed the prerogatives of a modern administrative state. Modeling the Ossianic space produced through these volumes therefore requires a topological rather than topographical approach.

Ossianic Geography

Relations between conceptual and geometric space are central features in both Macpherson's renditions of Ossianic poetry and the elaborate exercises in geographical critique and vindication they inspired. Macpherson's original publications, *Fragments of Ancient Poetry Collected in the Highlands of Scotland* (1760), *Fingal: An Ancient Epic Poem, in Six Books* (1762), and *Temora: An Ancient Epic Poem, in Eight Books* (1763) assembled Gaelic ballads which he had discovered in manuscript or transcribed from oral recitations and organized them into the form of an English-language epic, imaginatively filling in gaps and creatively producing altogether new poems. He accompanied these invented translations with copious footnotes of varied reliability which positioned the poetry in relation to places and traditions within the Gaelic speaking world. As both enthusiasm for the poems and controversy over their provenance increased, defenders and skeptics alike pored over these references, comparing the poems and Macpherson's claims about them to newly published, modern descriptions of the region. They collected testimonials and gathered manuscripts, wrote dissertations and produced new translations, and drew imaginative maps of ancient Scotland. This flurry of publications produced a network of places connected topologically through language. The intersection of this topological network with an economically and politically administered Scottish terrain created a structure of spatial relations far more

protean than any of the cartographic visualizations they inspired. As a whole, these publications underscore the fundamentally inter-textual nature of Ossianic geographies.

The opening pages of the six-book epic *Fingal* (1761) present a great example of Ossianic geography as a composite of spatial relations. The poetry narrates the arrival of the Scandinavian king Swaran and his invading fleet on the Irish coast, and the subsequent call to arms of Cuchullin and other Irish warriors who await the arrival of the Scottish king Fingal and his heroes. Place references such as 'Tura's wall', 'Ullin's plains', 'the heath of Malmor', 'the streams of Lena', and 'the murmuring rocks of Cuthon', all mentioned in the opening pages, suggest a cohesive world defined by discrete landmarks. At the same time, the unfolding narrative builds a sequence of spatial relations through prepositional phrases that obscure the primary action even as they contribute to the poem's sense of place. As Cuchullin sits 'by the tree of the rustling leaf,' his spear leaning 'against the mossy rock,' his scout, Moran, son of Fithil, warns him of the approach of the armies of Swaran, king of Lochlin, on ships 'of the dark-rolling sea.' Moran signals an alarm by striking 'the sounding shield of Cabait,' which 'hangs at Tura's rustling gate,' and whose sound spreads through woods and hills, calling forth a litany of heroes who emerge sequentially from 'the red tree of Cromla,' 'the streams of Lena,' and 'the whistling heath of Mora' (Macpherson 1996: 55). This sequence of heroic soundings creates a mythic landscape with its own internal logic of spatial relations.

Macpherson connects this landscape to eighteenth-century Ulster and the Scottish Highlands by means of imaginative, if spurious, annotations. He locates 'the remains of [Cuchullin's] palace at Dunseaich in the Isle of Skye.' Swaran and his heroes come from Lochlin, 'the Galic name of Scandinavia in general; in a more confined sense that of the peninsula of Jutland.' 'The heath of Malmor' is glossed as 'Meal-mór – *a great hill*,' and 'the murmuring rocks of Cuthon' as 'Cu-thón – *the mournful sound of waves*.' Most tellingly, 'rocking Cromla' which stands above 'Lena's dusky heath' is annotated as 'Crom-leach' which 'signified a place of worship among the Druids. It is here the proper name of a hill on the coast of Ullin or Ulster' (Macpherson 1996: 419-21). While the *alarum* of Cabait's shield connects the heroes of Cuchullin's army (Curach, Connal, Crugal, Ronnar, Lugar, Calmar, Puno, Cairbar, Eth, Ca-olt) to features of a purely mythic landscape, Macpherson's notes relate that landscape to the north-east coast of Ireland. While his annotations do not establish a systematic geography, later commentary would develop these suggestive connections into far more detailed mappings of the Ossianic terrain (Gidal 2015b).

It is important to observe that, within the logic of Macpherson's text, both poetry and annotations obey the same linguistic rules and produce analogous and even interchangeable sets of spatial relations. The affinities between poetic and editorial articulations of place are a central element of Macpherson's project, as they draw readers into roles analogous to the heroes, bards, and wanderers who roam the Ossianic landscapes, searching for markers by which to memorialize 'the deeds of days of other years' (Macpherson 1996: 127). Indeed, marking sites of defeat and burial through language constitutes one of the major activities of Macpherson's Ossianic poems. The final tale rendered in the 'Songs of Selma' narrates the fall of the maiden Daura ('fair as the moon

on the hills of Fura' ['Fuar-a, *cold island*'] and her brother Arindal at the hand of Erath, while their father, Armin, remains on the shore, helpless to save them:

> Alone, on the sea-beat rock, my daughter was heard to complain. Frequent and loud were her cries; nor could her father relieve her. All night I stood on the shore. I saw her by the faint beam of the moon. All night I heard her cries. Loud was the wind; and the rain beat hard on the side of the mountain. Before morning appeared, her voice was weak. It died away, like the evening-breeze among the grass of the rocks. Spent with grief she expired. (Macpherson 1996: 170)

As with the opening of 'Fingal,' we can parse Armin's recollection as a sequence of spatial relations, here established through Daura's fading cries as vainly heard by her mournful father who relives this trauma in future years in affective sympathy with a storm-tossed land: 'When the storms of the mountain come; when the north lifts the waves on high; I sit by the sounding shore, and look on the fatal rock' (Macpherson 1996: 170). Ossian in turn echoes Armin's plaint in the final lines of the poem, converting topography to metaphor as he mourns the passing of the heroic age: 'The sons of the song are gone to rest; my voice remains, like a blast, that roars, lonely, on a sea-surrounded rock, after the winds are laid. The dark moss whistles there, and the distant mariner sees the waving trees' (Macpherson 1996: 170). Such proleptic self-eulogy, in which the characters fade into a landscape to be witnessed by a belated traveler (in this instance a 'distant mariner'), is a mastertrope of Macpherson's Ossianic project and creates an affective experience of longing that not only helped promote a European aesthetic of romantic melancholy, but also endorsed a geographical imagination that sought tokens of Ossianic lore throughout the militarily-subordinated and ecologically-damaged Highlands. In this sense, Armin mourning his daughter Daura, Ossian mourning the departed 'sons of song,' the mariner catching echoes of Ossian's song in the wind-swept trees, and the modern reader following Macpherson's translations and notes – all participate in a spatialized vocabulary that dramatizes the fading of bardic cadences from an imagined topography through the affective experience of their imperfect realignment.

The antiquarian John Smith offered competing collations and translations of Ossianic poetry in his *Galic Antiquities* (1780) as well as a geographical dissertation on Macpherson's works. In his 'Dissertation on the Authenticity of Ossian's Poems' Smith locates the episode of Daura and Erath 'in an obscure and almost inaccessible part of Argyleshire, which it is certain the translator of Ossian never saw, and which from his own silence, the silence of tradition upon that story, and the distance and obscurity of the place, it is equally certain he never heard of':

> In this place can be traced out the very scene, and the very uncommon names of that episode, which of all the collection is perhaps the least known to a Gaelic antiquary. The island, to which he traitor Erath beguiled Dura, still retains his name, *Innis-Eraith*, 'the Island of Erath' … and about a mile distant from it is another farm,

> consisting of an extensive heath bounded by a large mountain-stream, and still retaining, from that unfortunate lady, the name of Durain, 'the stream of Daura.' (Smith 1780: 98)

Smith here refers to an island in Loch Awe in Argyll and his emphasis on what he terms an 'astonishing correspondence' between the poetry and the land became a repeated strategy for vindications of Macpherson and defenders of Gaelic traditions. This 'astonishing correspondence' suggests a point of connection between the perspectival mythic space of the poetry and the emergent administrative space of modern Scotland. To suggest such 'astonishing correspondence' is to position a network of spatial relations articulated in the 'Songs of Selma' in relation to a network of spatial relations articulated in the vicinity of Loch Awe. Such correspondence asserts the prerogatives of a modern geographical imagination even as it seeks to valorize the embedded consciousness of the land to be found in Ossianic poetry, thus more repeating than verifying the spatial associations established in Macpherson's originals (Gidal 2015a: 49-54).

This recurrent motif of spatial correspondence in these early Ossianic publications endorsed increasingly ambitious attempts at systematic geography in a sequence of later volumes. Sir John Sinclair collected numerous accounts of Ossianic traditions and toponyms in his monumental *Statistical Account of Scotland*, published over the course of the 1790s. The Rev. Donald Macnicoll, Minister of the United Parishes of Lismore and Appin, for example, observes that 'on the banks of the river Ete, the Fingalian Usnoch, and his three renowned sons, Naos, or Naois, Ailli, and Ardan were born, as set forth by Mr. Macpherson. This is a piece of traditionary history well known in these countries' (Sinclair 1791: 1.487). The Rev. Ludovick Grant of the United Parishes of Ardchattan and Mukairn identifies his district as the site of the ancient city of Beregonium, surrounded by landmarks identified in Ossianic poetry, including 'a rock rising in the form of a cone, on the end of a high hill, commanding a romantic prospect, which to this day retains the name of Grianan Dearduil, the basking-place of Darthula' (Sinclair 1793: 6.181). And the Rev. William Campbell, Minister of the Parishes of Kilchrenan and Lochavich notes that 'near Inisconnel lies Inish-Eraith, mentioned by Dr. Smith of Campbeltown … as the place to which the traitor Erath beguiled Duara, as recounted in one of the Songs of Selma' (Sinclair 1793: 6.267). From a linguistic perspective, we may characterize Sinclair's chorographical project as a sequence of topological statements assembled into a cross-referenced textual architecture designed as a reference for economic improvement and political administration. The amalgamation of Ossianic references within this architecture does not so much establish the poetry's authenticity as it establishes topological connections between literary and instrumental space.

Sinclair's approach was adopted directly by Henry Mackenzie who edited the *Report of the Committee of the Highland Society of Scotland…Into the Nature and Authenticity of the Poems of Ossian* (1805). This extensive collection of testimonials, translations, and manuscript reproductions is less concerned with locating the *actions* of Ossianic poetry than its *recitations*, providing what Maureen McLane terms an "ethnographic textualization" of

Gaelic poetic traditions (McLane 2008: 79). This textualization produces space through recorded networks of recitation and transmission, situating the poetry in the oral culture of the Highlands and a collection of cross-referenced manuscripts. The *Report of the Committee of the Highland Society of Scotland* assembles transcriptions from extant manuscripts, new translations of Ossianic traditions, and testimonial letters from parish ministers as well as accounts of bards, residents, and antiquarians from throughout the Highlands and Islands. The Committee concludes 'that such poetry did exist, that it was common, general, and in great abundance; that it was of a most impressive and striking sort, in a high-degree eloquent, tender, and sublime' (Mackenzie 1805: 151), even as it finds no individual poems that correlate exactly to the renditions offered in Macpherson's publications. 'There are a hundred places in the Highlands and Isles which derive their names from the Féinne, and from circumstances connected with their history,' observes Hugh M'Donald of South Uist, in his testimonial (Mackenzie 1805: Appendices 48), while Donald MacLeod, Minister of Glenelg, writes in a letter reproduced by the Committee, that "the most effectual method…of satisfying the doubts of the gentlemen who deny Highlanders the honour of these monuments of the genius and prowess of their ancestors, is to invite them to the Highlands…that they may examine the matter themselves. You may assure them of a hospitable reception; and wherever they go to, the gentlemen and clergy will find out to them the old men who still have in memory most of the works of Ossian, and the traditionary history of the Fingalians' (Mackenzie 1805: Appendices 31). Here we find a strong example of a "spatial event" in which the text and the land are brought into direct relation through a practice of reading. Both the *Statistical Account* and the *Report of the Select Committee* reproduce claims set forth in Macpherson's annotations, establishing networks of spatial associations through the actions of the poetry and the records of its transmission. Space registers less a foundation of authenticity than a hinge whereby the deeds of ancient warriors and the investigations of modern philologists are associated through the parameters of the modern state.

This associative logic informs a later work by one of Sinclair's original correspondents, Alexander Stewart, whose 'Topography of some of the Principal Scenes of Fingal and his Warriors' and 'A Brief Description of Selma' were included as appendices in the Highland Society of London's *Poems of Ossian in the Original Gaelic, with a Literal Translation into Latin, by the Late Robert MacFarlan, A.M.* (1807). To accompany Stewart's dissertation, the Highland Society produced the first engraved map of Ossianic territories, a graphic visualization that offers yet another translation of Ossianic poetry into modern media. Both Stewart's topography and the map of Selma locate Fingal's fabled stronghold on the peninsula between the mouths of Loch Creran and Loch Etive, including the Isle of Eriska, north of Oban:

> There is every reason to believe that Selma, so often mentioned in the poems of Ossian, as the principal residence of his father Fingal, was situate in that part of Argyleshire called Upper Lorn, on a green hill of an oblong form, which rises on the sea shore at equal distances from the mouths of the lakes Eite, and Creran. It is now

> called by the inhabitants of the place DUN-MHIC SNITHEACHAIN, i. e. the fort of the son of Snitho; but by some of our historians Berigonium, and by them said to have once been the capitol of the kingdom of the Gaels, or Caledonians. (Macfarlan 1807: 3.498)

In exactly the same way that computers can use geospatial topology to represent objects along routes or in relations of containment and adjacency, we can analyze statements like Stewart's to identify his 'mental map.' We can paraphrase him as saying that Selma is *contained by* Upper Lorn, which is in turn *contained by* Argyleshire. It is *disjoint from* but *near* both Loch Etive and Loch Creran. It is *equal to* or *corresponds with* a place called both Dun-mhic Snitheachain and Berigonium, which was *contained by* another place called Caledonia. Official and mythical geographies mingle in a common textual space where both occupy a common system of reference, written out in the schematic and abstract form of natural language. These spatial relationships, asserted by the text, can be modeled just like relationships that exist among real objects.

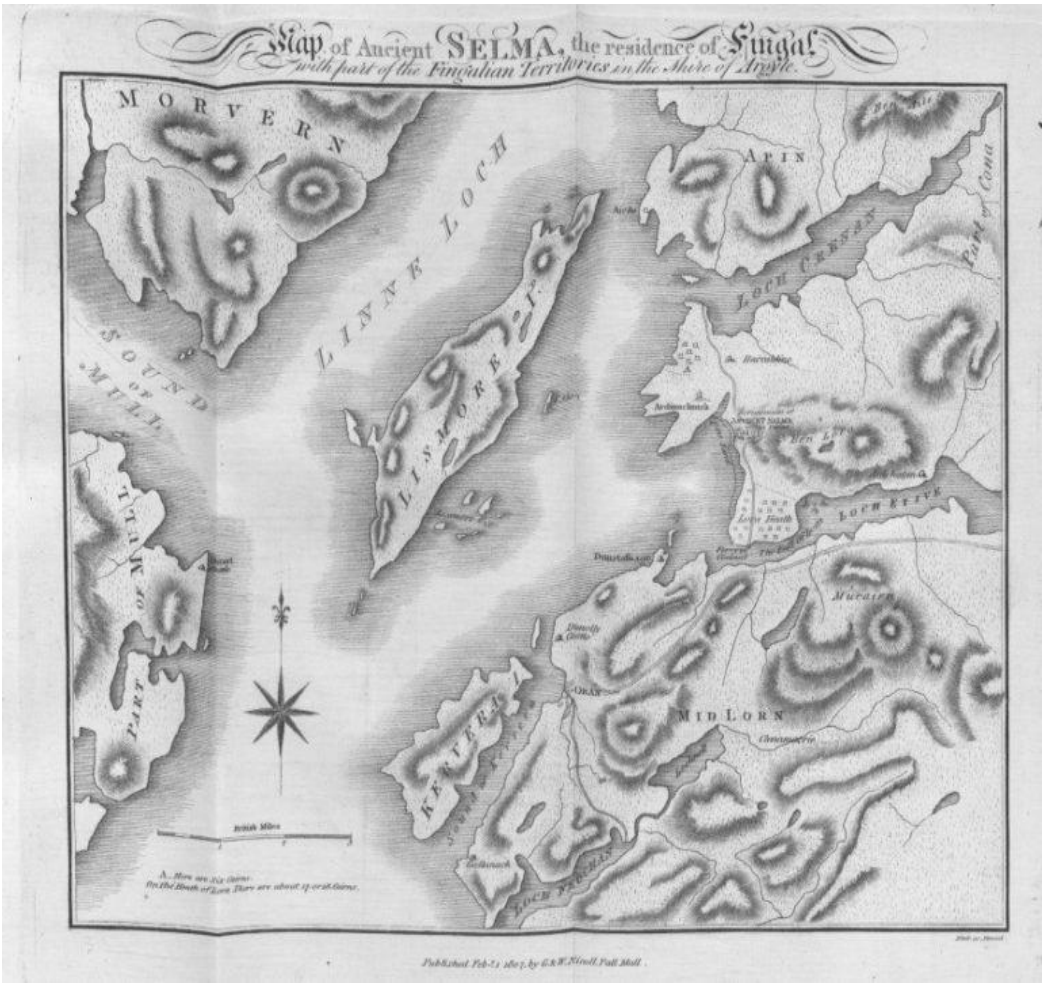

Figure 2. 'Map of Ancient Selma, the residence of Fingal, with part of the Fingalian Territories in the Shire of Argyle,' (1807).

'Should the diligent traveller,' Stewart concludes, 'find a perfect correspondence between the above scenes, and the description given of them in the poems ascribed to Ossian, he will not, it is hoped, attempt to deprive the ancient bard of his just merit' (Macfarlan 1807: 3.521). Again, the quest for correspondence between mythical and official places informs both the cultural patrimony of Scotland and the romantic fascination for readers, past and present. All of these volumes, from Macpherson's originals through Stewart's topographical dissertation, chart a set of complex spatial relations that exceed any map because they operate according to a logic that is fundamentally qualitative and topological. They do not settle questions of authenticity so much as they reproduce those questions through a sequence of intertextual correspondences. As each of these works created dense networks of spatial relations, these intertextual correspondences are also interspatial, variants of what Thurgill and Lovell term a 'spatial hinge' (Thurgill and Lovell 2019: 18). But these hinges offer less "interaction[s] between intra- and extra-textual space" (Thurgill 2021: 152) than intertextual relations between networks of spatial relations. Spatial connections between poetry, statistical reports, ethnographic inquiries, antiquarian investigations, and geographical vindications establish a network of relations central to the production of Scotland as a cultural region and economic zone.

Modeling Ossianic Space

How does one model literary topologies of the sort produced in this Ossianic literature? How can we represent the intertextual and interspatial relations that complexly weave textual and geographical space into a composite, unified conceptual whole? To develop our model, we gathered digital copies of the most relevant material and systematically noted their geographical assertions. Our goal was not comprehensiveness; we did not hope to represent the total discourse of the Ossian phenomenon. Instead, our aim was to analyze a few key texts in detail by translating prose statements from our collection into a structured form that makes the conceptual links among them explicit and therefore computationally tractable. Our model traces qualitative associations between our textual sources and a set of structured lists of geographical places, published by the British Ordnance Survey (OS), which began work in the 1790s and now maintains a large collection of open-source geographical datasets. The places listed in these databases include towns, lakes, and rivers, as well as historical counties, regions (like the 'Highlands'), countries, and continents. Our process was very much like geotagging. If a document in our collection used the phrase 'Loch Creran,' we tagged it to *correspond with* the same place named by the OS. If the text says that Loch Creran is *within* or *contained by* the county of Argyleshire, we noted that in the model as well. Every reference to a geographical place in our corpus was paraphrased into a subject-predicate-object tuple, coordinating a place named in the text (subject) with a place in the OS's databases (object), and the qualitative relation asserted in the text (predicate). The same method was used for any toponym

attested in our documents: Ossianic places like 'the Heath of Lora' can be folded into the model in exactly the same way as any official geographical place.

Unlike geotagging, which simply locates words in a text with coordinates of latitude and longitude, our model is designed to be more flexible by capturing a wider variety of qualitative relationships. Topological connections among Ossianic places often involve correspondence relations that are more or less straightforward. (But even simple correspondence relations aren't always so simple. For example, does Argyleshire 'correspond with' the modern county of Argyll & Bute, or should their relationship be more finely predicated?) Our model includes many different predicates that describe relationships of adjacency, containment, intersection, and proximity, and we recorded the statements whether they were affirmed as if known or merely suggested as possibilities, and whether they were past or present. If two sources disagree, both sources are documented equally; we made no effort to adjudicate among their claims. Every association in our model is not meant to declare an objective ground truth but to paraphrase, as accurately and completely as possible, the qualitative relationships among places as attested in our corpus. Unlike Stewart and his 'Map of Ancient Selma,' our goal was not to pinpoint Ossianic places on a map, but to trace the associations that Macpherson and later commentators believed to exist among them.

Once tabulated, these relationships can be modeled like a bimodal network that connects places described in natural language with geographically coordinated toponyms (see Figure 3). Each link in the network represents a predicate that describes relationships of correspondence, containment, or proximity between toponyms, referred to in language, and places, listed in official gazetteers. Once the bimodal network is established, it can then be projected onto unimodal form. If 'Upper Lorn' and 'Berigonium' are both identified by our sources as being within the county of Argyll, they will be linked to each other in the network, regardless of their geocoordinates. Graphs like these do not need to be plotted onto a map, because the relationships they depict are formed in natural language.

The small corpus we worked with had just 328,191 words, making it about the length of two large novels. Within this collection, we found references to 844 unique places, including both official geographical entities, like the Danube River, and mythical places, like 'the Vale of Rushes.' Among those places, we identified 2,708 instances of geographical testimony which we translated into subject-predicate-object tuples. The resulting bimodal network was projected onto unimodal form to show which places, within our corpus, were affiliated with each other by virtue of their shared geographical associations. We then performed a simple community detection algorithm to identify regions of the network and evaluated each node by *degree* (its number of connections) and *betweenness* (the number of unique paths that go through it).

Our network graph highlights how terms cluster and disperse across this topological space. A few large clusters of terms establish analogously central positions for Ossianic toponymy (*Lego, Cave of Tura, Cromleach, Cona, Malmor*) and Scottish place names (*Argyll, Glenorchy, Lismore, Mull, Loch Ness*), as well as a host of more abstract locales (*Highlands, Scottish Isles, Western Isles, Celtic nations, Gaelic-speaking region*). The Ossianic 'Morven' is a key

Table 1. 'Sample data observations (simplified) from the network model.' Every link in the network corresponds to a statement in the corpus that asserts or implies an association between places named in the texts and places named in Scotland's official geography. Please note that these examples are simplified, with various qualifiers removed, to emphasize the network structure of the resulting dataset. Our full data includes dates, feature types, and specific textual locations, along with more finely specified predicates. However, for the sake of clarity, the network model depicted below disregards those qualifiers and our demonstration presents all relationships simultaneously and equally.

Textual Source	Subject	Predicate	Object
stewart00topography	Selma	within	Argyll
stewart00topography	Argyleshire	corresponds_with	Argyll
stewart00topography	Upper Lorn	corresponds_with	Upper Lorn
stewart00topography	Upper Lorn	within	Argyll
stewart00topography	Dun Macsnichan	within	Argyll
stewart00topography	Berigonium	within	Argyll
macpher00fingal	Ireland	corresponds_with	Ireland
macpher00fingal	Temora	within	Ireland
macpher00fingal	Lochlin	overlaps_with	Scandinavia
macpher00fingal	Scandinavia	within	Europe
macpher00fingal	Ulster	within	Ireland
macpher00fingal	Tura	near	Ulster

connector for these nodal communities. As the Rev. Norman Mac Leod of the Parish of Morven had noted in the *Statistical Account of Scotland*, the parish's name is etymologically distinct from its use in the poems of Ossian, 'where it is derived from the Gaelic words *Mor Bheann*, i.e. of the great mountains, and seems to have been a general term for the *Highlands* or *hilly country*' (Sinclair 1794: 10.263). The Scottish historian Malcolm Laing, in his 1805 debunking of Macpherson's poems, underscored this same point for opposite ends, arguing that Macpherson 'was ignorant...of the genuine antiquities of his own country, when he converted Morven, a single parish in Argyleshire, into a kingdom comprehending the north west of Scotland' (Laing 1805: 1.51). And yet the confluence of these two spatial designations, a parish in Argyle and the whole of the Western Highlands, only increases the term's centrality within the network, bridging, as it does, locations identified by Stewart in his dissertation (*Lismore, Upper Lorn, Loch Etive*), topographical features of the parish (*straths* and *torrents*, *groves* of *birch, oak*, and *ash*), more general regions (*northwest of Scotland, west coast, Scotland*), features (*desart, mountain, mountain stream*), and, of course, Ossianic settings (*Vale of Croma, Caramala, Tirconnel, Circle of Loda, Hill of Dark Brown Hinds*).

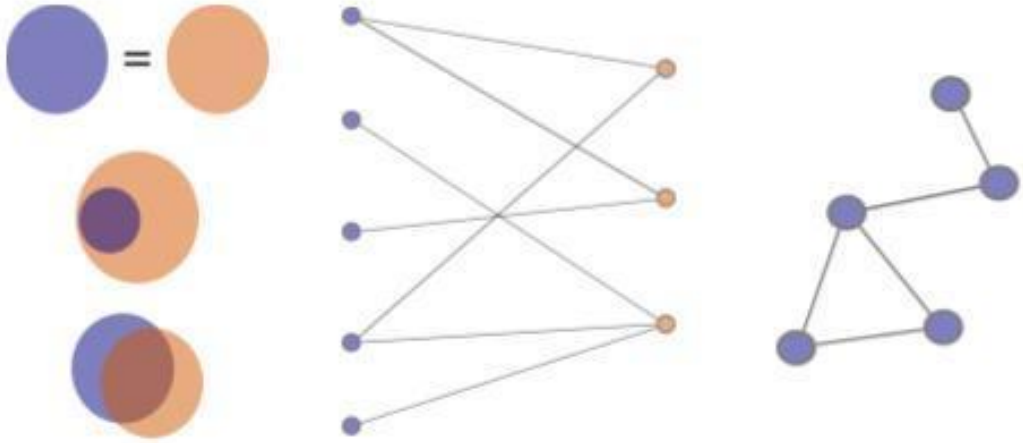

Figure 3. 'Geospatial topology, represented as a network.' Wherever our source texts identify relations of correspondence, containment and proximity (*left*), we translated those relationship into a database of links that form a bimodal network (*center*) between the places mentioned in our texts (*purple*) and those listed authoritatively in the Ordnance Survey, then projected onto unimodal form (*right*), to show how places mentioned in our documents are conceptually situated among each other. Thus, 'Selma' becomes linked in the network with 'Argyleshire' and 'Upper Lorn,' because they all share topological relations with the county of Argyll, as named in the Ordnance Survey's dataset of historical counties.

Near the center of the network lie two more connecting nodes, *Selma* and *Taura*, whose positions within the network are almost interchangeable, depending on what statistical measurement we use, a point that received particular attention from Stewart. With comparative evidence from copious passages in the poetry, he concluded it 'not improbable...that Taura was but another name of Selma; for what Ossian says of the one place, is equally applicable to the other.' (Macfarlan 1807: 3.505). While one might suggest this equivalence as evidence for the transitive conventions of landscape descriptions in Macpherson's works, these two terms occupy the two primary positions in the same place neighborhood or community of terms, organizing references from Stewart's topography and the Parish report for Ardchattan and Muckair in the Presbytery of Lorn, where the mythic stronghold of Beregonium and the Ossianic Hills of Cona join Glen Etive, Loch Nell, the village of Connel, and the seventeenth-century castle of Balcardine. Selma and Taura remain purely mythical constructs; within the parameters of Ossianic geography, they organize a wide range of locations in Argyllshire.

Figure 4. 'The network of Ossianic places.' When visualized as a single, unimodal network, Ossianic space sorts into several large clusters. The clusters are dominated by nodes that serve as local hubs. Places like Ireland, Scotland, and Argyll contain many smaller places and are locally important, while toponyms like 'Morven,' 'Selma,' and 'Lochlin' are poised between the geographical and the mythical and so provide crucial bridges between regions of Ossianic space. Data analyses and visualization were produced using the 'igraph' package in R (Csárdi 2006).

Table 2. 'Top nodes by degree and betweenness.' Places with the highest degree will be the places most often mentioned in the texts and these tend to be large places that contain others, like Ireland, and the Highlands. Places with high degree are likely also to have high betweenness, but important bridge nodes can exist on the conceptual outskirts, like general references in the poems to the 'desart' of unsettled land surrounding Fingal's land, or like references to historical terms like the 'Celtic nations' and the 'Roman Empire,' which linked Scotland's past with its mythological origins and the modern nation-states of Europe.

Place	**Degree**	**Place**	**Betweenness**
Ireland	18755	Morven	37666
Highlands	15379	Desart	15342
Morven	7243	Sora	10870
Cromla	7146	Celtic nations	10114
Scotland	7092	Cromla	9782
Selma	6944	Kilcalmonell	9671
Heath of Lena	5748	Selma	6845
Lena	5672	Lonely Isle	6695
Erin	4832	Roman Empire	6006
Argyll	4650	Picts (land of)	5778
Lochlin	4230	Lowlands	4901
Ulster	3576	Glenlyon	4175
desart	3542	Innistore	4012
Lego	3192	Lochlin	3666
Ardven	3177	Lubar	3595
Cave of Tura	3088	Lena	3271
Celtic nations	2847	Ullin	3151
Sky (Isle of)	2737	Epidium	3141
Ullin	2703	Campbelton	2813
Innisfail	2660	Cape Finisterre	2615

While the central nodes are of considerable interest, so too are outliers in the network, connected by only a few or even a single term. Clusters of geographical regions from beyond Scotland, be they British (*Britain, North Britain, English speaking*), continental (*Sweden, Germany, Denmark, Jutland*), or more global (*Persia, Palestine, Africa, Carthage*) are dependent on a couple of key bridge terms (*Lochlin* and *Roman Empire*) for their connection to the rest of the network. This makes perfect sense as the battles with Swaran, King of

Lochlin and memorialized confrontations with the Romans are the two primary contests narrated or alluded to in Macpherson's poems. The term *Saxons* joins Albion and associated kingdoms and regions in the British Isles with *Celts*, *Gauls*, *Scythians*, and the *Kingdom of Snows*. Places associated with the Isle of Skye also form a distinct outlier in this network, even as they fuse place names we would term Scottish (*Trotternish, Portree, Dunscaith*) and Ossianic (*Fingals Seat, Achanambard*). A third outlier cluster of terms (*Kilkerran church, Campbeltown harbor, St Causlan chapel*) contains locations in the Mull of Kintyre, connected not by Ossianic toponymy, but by the location of manuscripts identified in the *Highland Society Report* and the parish report for Campbeltown from Sinclair's *Statistical Account*.

Table 3. 'Top nodes, by community.' The five largest communities correspond with major regions of Ossianic geography. The largest community is made up primarily of locales mentioned by Macpherson's authenticators in the Highland Society Report and the Statistical Accounts of Scotland. Other clusters blend Ossianic and official geographies, sorting into major regions associated, respectively, with Ireland, Scandinavia, the Highlands, and Scotland as a whole. Other large groups, not listed on this table, include toponyms related to English history, the Hebrides, and Europe more generally. Places are listed in descending order by degree; Ossianic toponyms highlighted with italics.

Nodes	**Top nodes, by community**
113	Argyll, Campbelton, Ardchattan, Glenorchy, Lorn, Lismore, Kilbride, Muckairn, Glen Etive, Mull, Airds, Killmalie, Druid monuments (Ardchattan), Cairns (Ardchattan), Cairns (Argyll), Glenlyon, Kilkerran, Achallader, Appin
99	Ireland, *Cromla*, *Heath of Lena*, *Lena*, *Erin*, Ulster, *Lego*, *Cave of Tura*, *Ullin*, *Innisfail*, *Tura*, Dunkeld, *heath*, *Temora*, Druid nations, *Cromleach*, *Plains of Lena*, Leinster, *Mudan*, *Terman*
82	Lochlin, *Lubar*, Roman Empire, *Gormal*, *Sora*, Scandinavia, *Lano*, Europe, Gaul, *Halls of Starno*, Scythia, Saxons (land of), Pillars of Hercules, Celto-Scythians (land of), Cape Finisterre, Danube, Transylvania, Wallachia, Moldavia
62	Highlands, Morven, *Ardven*, *Cona*, Scottish Isles, *Mora*, Innistore, Fail, West Highlands, *Malmor*, Western Isles, *Hill of Hinds*, *Bay of Rotha*, *Craca*, *Branno*, *Grave of Fingal*, *Circle of Loda*, Roya Falls, Loch Ness, Loch Oick
48	Scotland, *desart*, Celtic nations, Caledonia, *Fingal (land of)*, *four stones*, Lowlands, North Scotland, Scotland (western coast), Picts (land of), *cave*, West Scotland, Dalavich, *Drayno*, Gaelic-speaking region, Kilcalmonell, Bran, Ruthven, Culdich

This topological network provides a more nuanced sense of the Ossianic space produced in these volumes than any two-dimensional cartography could hope to achieve. Rather than reducing the curious syntax of spatial reflection articulated in Ossianic literature to a map of the territories in question, it allows us to trace associative patterns produced by this early project in literary topology. Attending to language rather than to geo-coordinates allows us to more carefully document and visualize how an invented language of Gaelic translation intersected with the emergent discourse of a modernizing nation and how a sequence of contested truth claims surrounding history and heritage were united with the surveying projects of a rapidly improving economic zone.

Conclusion

In a much more recent bid at authentication, Joseph Yose and his collaborators have used network science to establish continuities between Macpherson's Ossianic corpus and the Gaelic legends upon which he drew. They demonstrate that the character networks in the poems align more closely with Irish sources than with the Homeric models noted by Macpherson and his defenders and skeptics alike (Yose et al. 2016). As Sally Bushell et al. have recently argued, however, such network models offer an equally productive method for understanding literary space, one less concerned with grounding the literary text in a cartographic construct of the real than in tracing the experience of place as articulated in language (Bushell et al. 2021). The Ossianic literature we have surveyed offers a particularly rich corpus for such topological exploration and enables us to model the complexities of imagined worlds irrespective of their connections to the geographies of lived experience. And yet their connection to such administered geographies plays an important role in the history of their reception. For the administration of space has its own coterminous history, one with significant political, economic, and environmental implications. The topological methods we have modeled in this essay may be applied not only to imaginary worlds, but to a wide range of geographical literature, such as Sinclair's statistical geography and the British Ordnance Survey, that was instrumental in the economic and political restructuring of the modern world. Connecting the conceptual topologies of literary and geographical archives opens new possibilities for scholars interested in the environmental history of print culture and provides new tools for mapping the textual ecologies of the industrial age.

Works Cited

Anderson, J. (2016) 'Between 'Distant' and 'Deep' Digital Mapping: Walking the Plotlines of Cardiff's Literary Geographies.' In Cooper, D., Donaldson C. and Murrieta-Flores, P. (eds) *Literary Mapping in the Digital Age*. New York: Routledge, pp 161-181.

Baines, P. (1997) 'Ossianic Geographies.' *Scotlands*, 4, pp 44-61.

Bennett, D. C. (1975) *Spatial and Temporal Uses of English Prepositions: An Essay in Stratificational Semantics*. London: Longman.

Bushell, S., Butler, J., Hay, D., Hutcheon, R., and Butterworth, A. (2021) 'Chronotopic Cartography: Mapping Literary Time-Space.' *Journal of Victorian Culture*, 26(2), pp. 310-325.

Bär, G. and Gaskill, H. (eds). (2012) *Ossian and National Epic*. Frankfurt: Peter Lang.

Cassirer, E. (1944) 'The Human World of Space and Time' In *An Essay on Man: An Introduction to a Philosophy of Human Culture*. New Haven: Yale University Press, pp 42-55.

Cassirer, E. (1955) *The Philosophy of Symbolic Forms. Vol 2: Mythical Thought*. R. Manheim (trans) New Haven: Yale University Press.

Csárdi, G. and Nepusz, T. (2006) 'The *igraph* Software Package for Complex Network Research.' *InterJournal Complex Systems* (Manuscript No. 1695).

Curley, T. (2009) *Samuel Johnson, the 'Ossian' Fraud, and the Celtic Revival in Great Britain and Ireland*. Cambridge: Cambridge University Press.

Davis, L. (1998) *Acts of Union: Scotland and the Literary Negotiation of the British Nation, 1707-1830*. Stanford: Stanford University Press.

Egenhofer, M. J. (2015) 'Qualitative Spatial-Relation Reasoning for Design.' In Gero, J. S. (ed) *Studying Visual and Spatial Reasoning for Design Creativity*. Springer, Dordrecht, pp 153-175.

Egenhofer, M. and Franzosa, R. (1991) 'Point-Set Topological Spatial Relations.' *International Journal of Geographical Information Systems*, 5(2), pp 161-174.

Egenhofer, M. and Mark, D. M. (1995) 'Naive Geography.' In *International Conference on Spatial Information Theory*. Berlin, Heidelberg: Springer, pp. 1-15.

Gaskill, H., (ed) (2004) *The Reception of Ossian in Europe*. London: Thoemmes Continuum.

Gavin, M. and Gidal, E. (2017) 'Scotland's Poetics of Space: An Experiment in Geospatial Semantics.' *Cultural Analytics*, 2(1), 11072.

Gidal, E. (2015a). *Ossianic Unconformities: Bardic Poetry in the Industrial Age*. Charlottesville: University of Virginia Press.

Gidal, E. (2015b) 'Ossianic Telegraphy: Bardic Networks and Imperial Relays.' *Studies in Scottish Literature*, 41(1), pp 129-142.

Giordano, A. and Cole, T. (2018) 'The Limits of GIS: Towards a GIS of Place.' *Transactions in GIS*, 22(3), pp 664-676.

Hones, S. (2008) 'Text as It Happens: Literary Geography.' *Geography Compass*, 2(5), pp 1301-1317.

Hones, S. (2022a) 'Interspatiality.' *Literary Geographies*, 8(1), pp. 15-18.

Hones, S. (2022b) *Literary Geography*. New York: Routledge.

Ivanova, T. (2019) 'Extended Contact Algebras and Internal Connectedness.' *Studia Logica,* 108, pp 1-16.

Kristeva, J. [1986]) 'Word, Dialogue, and Novel.' In Moi, T. (ed) *The Kristeva Reader*. New York: Columbia University Press, pp. 34-61.

Kuipers, B. J. (1977) *Representing Knowledge of Large-Scale Space*. PhD. Thesis. MIT.

Lang, A. (2014) 'Visual Provocations: Using GIS Mapping to Explore Witi Ihimaera's *Dear Miss Mansfield*.' *English Language Notes*, 52(1), pp. 67-80.

Leask, N. (2016) 'Fingalian Topographies: Ossian and the Highland Tour, 1760-1805.' *Journal for Eighteenth-Century Studies*, 39(2), pp 183-196.

Leask, N. (2020) *Stepping Westward: Writing the Highland Tour c.1720-1830*. Oxford: Oxford University Press.

Lynch, K. (1960) *The Image of the City*. Cambridge: MIT Press.

Macfarlan, R. (1807) *The Poems of Ossian, in the Original Gaelic, with a Literal Translation into Latin*. London.

Mackenzie, H. (1805) *Report of the Committee of the Highland Society of Scotland*. Edinburgh.

Macpherson, J. (1996) *The Poems of Ossian and Related Works*. Gaskill, H. (ed). Edinburgh: Edinburgh University Press.

Manning, S. (2007) 'Henry Mackenzie's *Report on Ossian*: Cultural Authority in Transition.' *Modern Language Quarterly*, 68(4), pp 517-539.

Mark, D. M., Freksa, C., Hirtle, S. C., Lloyd, R. and Tversky, B. (1999) 'Cognitive Models of Geographical Space.' *International Journal of Geographical Information Science*, 13(8), pp. 747-774.

McLane, M. (2008) *Balladeering, Minstrelsy, and the Making of British Romantic Poetry*. Cambridge: Cambridge University Press.

Mulholland, J. (2013) *Sounding Imperial: Poetic Voice and the Politics of Empire, 1730-1820*. Baltimore: The Johns Hopkins University Press.

Murrieta-Flores, P. and Howell, N. (2017) 'Towards the Spatial Analysis of Vague and Imaginary Place and Space: Evolving the Spatial Humanities through Medieval Romance.' *Journal of Map & Geography Libraries*, 13: pp 29-57.

O'Keefe, J. (1996) 'The Spatial Prepositions in English, Vector Grammar, and the Cognitive Map Theory' In Bloom, P., Peterson, M. A., Nadel, L. and Garrett, M. F. (eds) *Language and Space*. Cambridge: MIT Press, pp. 277-316.

Presner, T., Shepard, D., and Kawano, Y. (2014) *HyperCities: Thick Mapping in the Digital Humanities*. Cambridge: Harvard University Press.

Railton, S. (2015) 'Digitizing Yoknapatawpha.' *The Mississippi Quarterly*, 68(3-4), pp. 456-459.

Sinclair, J. (1791-99) *The Statistical Account of Scotland*. 21 vols. Edinburgh.

Talmy, L. (2000) *Toward a Cognitive Semantics* (Vol. 2). Cambridge: MIT Press.

Tambassi, T. (2017) 'Geographical Taxonomy for Geo-ontologies.' *Axiomathes*, 27, pp. 355-374.

Tenen, D. Y. (2018) 'Towards a Computational Archaeology of Fictional Space.' *New Literary History*, 49, pp. 119-147.

Thurgill, J. (2021) 'Literary Geography and The Spatial Hinge.' *Literary Geographies*, 7(2), pp. 152-156.

Thurgill, J. and Lovell, J. (2019) 'Expanding Worlds: Place and Collaboration in (and after) the 'Text-as-Spatial-Event'.' *Literary Geographies*, 5(1), pp. 16-20.

Trevor-Roper, H. (2008) *The Invention of Scotland: Myth and History*. New Haven: Yale University Press.

Trowbridge, C. C. (1913) 'On Fundamental Methods of Orientation and 'Imaginary Maps" *Science*, 38(990), pp 888-897.

Trumpener, K. (1997) *Bardic Nationalism: The Romantic Novel and the British Empire*. Princeton: Princeton University Press.

Tyler, A. and Evans, V. (2003) *The Semantics of English Prepositions: Spatial Scenes, Embodied Meaning and Cognition*. Cambridge: Cambridge University Press.

Weinbrot, H. (2007) *Britannia's Issue: The Rise of British Literature from Dryden to Ossian*. Cambridge: Cambridge University Press.

Yose, J., Kenna, R., MacCarron, P., Platini, T. and Tonra, J. (2016) 'A Networks-Science Investigation into the Epic Poems of *Ossian*.' *Advances in Complex Systems*, 19, 4-5.