

STUDY, MARKETPLACE AND LABYRINTH: GEOMETRY AS RHETORIC

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DIRTY OR CLEAN?

It is all too easy to think that we understand the power and the charm of the early modern map. In those often magnificent examples of global, regional and even local cartography, which have survived the centuries we imagine we perceive the spirit of European artists, rulers, merchants and landlords for the first time in possession of their material environment: bursting the bubble of Medieval parochialism and stretching out to govern a space as limitless as the geometry which framed it. And if we do not celebrate this breaking free from place to space then we mourn it, as the dawn of a new age of panoptic discipline and surveillance.

For many cultural historians the cartographic mathematisation of experience is a crucial marker of modernity, and of the revolution in ideas and values that fostered early modern capitalism and imperialism. If arts such as geography embraced mathematical technologies and aesthetics in the late sixteenth and seventeenth centuries they are held to have done so in an empiricist, pragmatic and mercantile spirit, treating the material world as so much dead matter to be cleanly abstracted, partitioned and exploited: subjected to a distinctly modern form of discipline. Graham Huggan sees in the 'reinscription, enclosure and hierarchization of space' executed by the post-Renaissance map, 'an analogue for the acquisition, management and reinforcement of colonial power'.¹ Samuel Edgerton finds in the orthogonal grid common to Ptolemaic cartographic projection and Albertian artificial perspective in painting, a 'symbol of cultural expansion'.² David Harvey observes that the geometric aesthetic of Ptolemaic cartography made the world in general seem 'conquerable and containable for purposes of human occupancy and action'.³

The problem with these judgements is encapsulated in Edgerton's 'symbol' as it is in Huggan's 'analogue'. How do we know what the geometry of early modern maps symbolised or seemed to their early modern makers and users? How can we judge the cultural currency of the early modern map?

Since the 1980s we have become used to regarding early modern cartographies as maps of cultural meaning, rather than simply of material space. But the critical history of early modern cartography that has developed over the past three decades is highly heterogeneous, and by no means agreed on the ways in which cartography is cultural. The most

1. Graham Huggan, 'Decolonizing the Map: Post-Colonialism, Post-Structuralism and the Cartographic Connection', *Ariel: A Review of International English Literature*, 20, 4 (1989): 115-131, p115.

2. Samuel Edgerton, 'From Mental Matrix to *Mappamundi* to Christian Empire: The Heritage of Ptolemaic Cartography in the Renaissance', in David Woodward (ed), *Art and Cartography: Six Historical Essays*, Chicago, University of Chicago Press, 1983, p22.

3. David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, Oxford, Basil Blackwell, 1989, p246.

materialist histories treat maps as what we might call 'dirty' entities, locating them in tightly specified local processes and transactions.⁴ Other scholars have constructed relationships between maps and verbal texts, widely separated in historical time and material space, over the 'cleaner' common ground of symbolism and formal analogy. So is the map clean or dirty? Is it a text that we can read effectively in modern galleries, libraries and classrooms? Is it, on the other hand, a material commodity whose historical significance lies beyond it, in those local transactions and performances in which it was originally engaged?

This question has profound ramifications for the place we give to cartography in early modern culture, and for the way we read or decline to read the map. In this essay I will attempt an answer, reviewing past strategies and exploring the possibilities for reading cartography with writing. I will argue that early modern cartography was rhetorical: engendered and closely supplemented by processes of verbal argument and persuasion, and regarded in itself as a persuasive gesture. Early modern maps were used not just to represent space but also to negotiate the identity, the legitimacy and the agency of individuals, groups and ventures. As an element in these negotiations they were characteristically entangled in a web of words which all too frequently evaporates in idealist readings and materialist histories of cartography. Neither clean nor dirty, they were often intended as dusty metaphors for the liminal relationship between virtue and profit, knowledge and the world.

FROM TRANSPARENT WINDOW TO THICKENED TEXT

The traditional, positivist history of cartography is teleological and idealist.⁵ Traditional cartographic history assumes consistent development towards a modern scientific practice founded on the discipline of geometric measurement and projection and treats individual maps as neutral contributions to a Platonic archive of geographic knowledge. It treats the geometric space delineated in early modern maps, if not as a Newtonian absolute category of the world, then as a Kantian absolute category of the mind. The first revolution in a critical history of cartography involved what might be called a thickening of the map, a shift from the essentially idealist habit of seeing through it, as a window on the world, to one of reading it, as cultural text. This revolution began in the history of art.

The iconological tradition in art history, inaugurated by Erwin Panofsky, treats the newly geometric spatiality of early modern maps and paintings not as 'a definitive victory over Medieval parochialism and superstition' but as a form of culturally specific, symbolic meaning which can be read.⁶ This approach has informed a revisionist history of cartography which seeks to appreciate the geometric map as cultural text. Yet in the main this new history has acted only as a mournful counterpoint to traditional map history, reinforcing its idealism through a set of complementary assumptions about

4. See, for instance, Jerry Brotton, *Trading Territories: Mapping the Early Modern World*, London, Reaktion, 1997.

5. Matthew Edney, 'Cartography Without "Progress"', *Cartographica*, 30, 2/3 (1993): 57.

6. Samuel Y. Edgerton, *The Renaissance Rediscovery of Linear Perspective*, New York, Basic Books Inc., 1975, p9.

7. Michel Foucault, 'Space, Knowledge, and Power', in Paul Rabinow (ed), *The Foucault Reader*, Harmondsworth, Penguin, 1986, p254.

8. Michel Foucault, 'Panopticism', in Paul Rabinow (ed), *The Foucault Reader*, Harmondsworth, Penguin, 1986, pp208-9.

9. Denis Cosgrove and Stephen Daniels, 'Introduction: Iconography and landscape', in Denis Cosgrove and Stephen Daniels (eds), *The Iconography of Landscape: Essays on The Symbolic Representation, Design and Use of Past Environments*, Cambridge Studies in Historical Geography 9, Cambridge, Cambridge University Press, 1988, p1.

10. Harley, J.B., 'Maps, Knowledge, and Power', in Denis Cosgrove and Stephen Daniels (eds), op. cit., 277-312.

11. *Ibid.*, p282.

12. See, for instance, Mark Koch, 'Ruling the World: The Cartographic Gaze in Elizabethan Accounts of the New World', *Early Modern Literary Studies* 4, 2, Special Issue 3 (September, 1998): 11, <<http://purl.oclc.org/emls/04-2/kochruli.htm>>; William Boelhower; 'Inventing America: a model of

the modernity of the early modern map, and shadowing the traditional view of cartographic 'discipline'.

MAPS, KNOWLEDGE AND POWER

If it learns from iconology in its preparedness to read the map, the new cartographic history also owes much to French structuralism, and specifically to Michel Foucault, in its account of what the map might say. Foucault's analysis of the uses and the politics of Enlightenment space is notoriously pessimistic, treating modern modes of spatial thought and planning as inextricable from the exercise of power. Linnaean botany and the sciences of madness and penology map out common ground for Foucault in a 'spatialisation of knowledge' working to define and subject nature and humanity and embodied in the pun of 'discipline'.⁷ In both of its senses 'discipline', notes Foucault, 'fixes; it arrests or regulates movements; it clears up confusion ... it establishes calculated distributions'.⁸ Foucault's descriptions of the 'spatialisation of knowledge' and of the disciplinary uses of spatial planning and representation have proved vastly fertile in revisionist studies of cartographic history, and most prominently in the work of Brian Harley.

One of the most widely read of Harley's essays is included in Denis Cosgrove and Stephen Daniels's 1988 collection *The Iconography of Landscape*. Harley's essay reads cartography as a Panofskian 'cultural image', and Harley's title 'Maps, Knowledge and Power' makes clear the Foucauldian parameters within which he intends to read the map.⁹ Harley regrets that cartographic history has been dominated to date by a positivist teleology of evolving accuracy. What this history elides, he suggests, is the partiality of modern maps as simply a 'way of conceiving, articulating, and structuring the human world'.¹⁰ In fact, Harley argues, the 'Euclidean syntax' privileged in post fifteenth-century cartography did not just reflect the world, but 'structured European territorial control'.¹¹ The particular rhetoric of 'authority' explicit in the Medieval map had not gone away, but was now hidden by this 'silent' geometric syntax.

FROM PRODUCT TO PROCESS

Harley's interventions laid out the ground for a critical history of cartography which examines the role of maps in the cultural making of knowledge. Much of what has followed has reproduced Harley's pessimistic reading of the 'Euclidean syntax' of cartography.¹² Yet several notes of warning have been sounded in recent years which have worked to undermine this simultaneously Foucauldian and iconological approach. These warnings have come primarily from two directions: one, that of traditional, positivist map scholarship; the other, an alternative fork to Harley's in the path of a newly cultural history of geography.

In his introduction to the posthumous collection of Harley's essays *The New Nature of Maps* (2001), map historian J.H. Andrews poses the following rhetorical question: 'positivist historians have plenty to do when confronted with a previously unknown map ... What can the non positivist scholar do except say, 'Just as I thought: more glorification of state power'.¹³ The problem, as Andrews sees it, is that whilst it is easy for the positivist historian, and even the lay map reader to decode simple layers of cartographic meaning - inductively, or by using a key - 'there is nowhere they can go to verify the presence of the abstract ideas allegedly embodied in the map'.¹⁴ In the absence of any specifically cartographic evidence for these 'abstract' meanings, Andrews finds Harley relying on 'an analogy with other art forms whose practitioners have been more communicative'.¹⁵ And this strategy of analogising leads him to consider not only what Andrews considers inadmissible evidence from other disciplines - 'art history, literary criticism, architecture, and music' - but also 'non-cartographic' elements of maps themselves, including 'decorative embellishments'.¹⁶

Andrews's critique suggests that Harley's iconology over-reads the map: reifying and totalising its meaning; filling its apparent silences with misplaced rhetorics from elsewhere. Similar warnings have been sounded from a rather different direction. Since Foucauldian New Historicism became conspicuous as a movement in literary studies a host of materialist cultural critiques have focussed on the way in which this approach can seem to further the work of the representational practices it describes, perfecting their forms and re-incorporating that which escapes them as part of the 'system'. Responsibility for this theoretical totalising can be traced directly to Foucault: firstly for the closure which he attributes to the modern 'disciplinary society' and its 'indefinitely generalizable mechanism of panopticism', and secondly for the formalism by which he models it.¹⁷ Foucault himself acknowledged - in dialogue with a group of geographers - his use of an analytic lexicon replete with unexamined spatial metaphors: of 'implantation, delimitation and demarcation ... the organisation of domains'.¹⁸

New cartographic historicists, to coin a rather awkward label for Foucauldian map-readers in the style of Brian Harley, can seem highly vulnerable to this materialist critique. Rather than relating representations to their specific local conditions of meaning and use they often map formal patterns discovered in their texts onto spatialities still more abstract and idealist than those of Enlightenment geometry. Moreover they can often seem to elide the gap between these aesthetic and conceptual spatialities and the space of practical activity, as if the map really were an ideal encapsulation of the world. In his analysis of American cartography, for example, William Boelhower projects a battle between an imperialist geometry which seems to have its own agency, and resistant cartographic toponyms whose inherent particularity opens 'a trap door ... in the written surface of the map'.¹⁹ Julia Lupton writes similarly of rebel resistance to English cartography in Ireland 'cracking, piercing and mutating' the colonial

cartographic semiosis', *Word and Image* 4, 2 (1988): 475-497; Bernhard Klein, *Maps and the Writing of Space in Early Modern England and Ireland*, London, Palgrave, 2001.

13. J.H. Andrews, 'Introduction', in J.B. Harley and Paul Laxton, *The New Nature of Maps: Essays in the History of Cartography*, Baltimore, MD and London, Johns Hopkins University Press, 2001, pp31-2.

14. *Ibid.*, p11.

15. *Ibid.*

16. *Ibid.*

17. Michel Foucault, 'Panopticism', op. cit., p206.

18. Michel Foucault, 'Questions on Geography: Interview with the Editors of *Hérodote*', in Colin Gordon (ed) *Power/Knowledge: Selected Interviews and Other Writings 1972-1977* by Michel Foucault, Brighton, Harvester Press, 1980, p72.

19. William Boelhower, op. cit., p494.

20. Julia Lupton, 'Mapping Mutability; or, Spenser's Irish Plot', in Brendan Bradshaw, Andrew Hadfield and Willy Maley (eds), *Representing Ireland: Literature and the Origins of Conflict, 1534-1660*, Cambridge, Cambridge University Press, 1993, p93.

21. Henri Lefebvre, *The Production of Space*, Donald Nicholson-Smith (trans), Oxford, Blackwell, 1991, p4.

22. *Ibid.*, p16.

23. Peter Jackson, *Maps of Meaning: An Introduction to Cultural Geography*, London, Unwin Hyman, 1989, pp7-8.

24. Denis Cosgrove, 'Introduction: Mapping Meaning', in Denis Cosgrove (ed), *Mappings*, London, Reaktion, p1.

25. *Ibid.*, p2.

26. Peter Jackson, *op. cit.*

27. C.D. Pocock, 'Interface: Geography and Literature', *Progress in Human Geography*, 12 (1988): 87-102.

geometric plane.²⁰

From the materialist point of view these idealist slippages between abstract and concrete space are the product of a characteristically Foucauldian over-estimation of representation itself. Attacking the dominant language model of cultural analysis and demanding a Marxian critical shift from products to processes, Henri Lefebvre has complained of Foucault that he 'never explains what space it is that he is referring to, nor how it bridges the gap between the theoretical (epistemological) realm and the practical one, between mental and social, between the space of the philosophers and the space of people who deal with material things'.²¹

Panofsky encouraged the student of art to read widely in order to historicise their intuitive interpretation of artistic symbolism. In his monumental history and critique of spatial production Lefebvre constantly urges caution in this critical turn to language. Real space for Lefebvre is social space, and it is produced through processes in which the abstractions of verbal media play no especially privileged role. Why, he asks, should language be granted the special status Foucault and his ilk implicitly accord it? 'Does language ... precede, accompany or follow social space? Is it a precondition of social space or merely a formulation of it?'²²

Materialist cultural geographies have often accorded with these warnings about language and representation. Peter Jackson, like Denis Cosgrove a geographer highly instrumental in importing cultural studies methodology into his discipline, insists that his call for a 'more expansive view of culture' shouldn't lead to the over-privileging of linguistic cultural forms.²³ In writing published since *The Iconography of Landscape*, Denis Cosgrove has worried about the de-historicising universalism of criticism preoccupied with reading the aesthetics of the map itself.²⁴ When we shift our focus from product to process, he suggests, we soon see the 'aesthetics of closure and finality dissolve'.²⁵

These materialist critiques suggest that we should tread very carefully indeed before reading maps as 'cultural images', rather than local interventions in material social processes. Yet notwithstanding the warning signs staked out along disciplinary boundaries a new cultural history of geography has placed considerable emphasis on the literary text, as an element within processes of cultural reproduction, and has also pushed the analogy of reading far beyond the bounds of written texts, exploring the iconology of spatial forms from homes to landscapes to cartographic maps themselves as cultural 'maps of meaning'.²⁶ The 'interface', as one scholar calls it, between literary and cartographic study is proving massively fertile ground, and yet what or where exactly is this interface?²⁷

IDEALIST ANALOGIES AND THE POST-STRUCTURALIST CRITIQUE

Much of the most recent work on the relationship between geography and literature seeks to establish a broader context for spatial representation than

that of local processes and transactions. At its most challenging, this kind of work relates literature and cartography in terms of overlapping modes of cultural production, subject to distinct but related social pressures, mediated by distinct but related generic codes. In its attention to the local limitations both of social process and of generic form it is able to ward off much of the cultural formalism of which New Historicism stands accused. But this formalism persists in the tendency of most literary readings of cartography to make their comparisons over the abstract and idealising common ground of formal analogy, 'reducing' the cultural specificity of their subjects.

Most literary scholars of cartography can be accused to some degree of that preoccupation with the aesthetic associated with Foucauldian New Historicism. Moreover rather than re-integrating the formal abstractions of cartography and literature with the local processes of production and consumption which generated them, these readings often reinforce them through idealising analyses of the 'space' engendered by cartography and literature.

In their seminal work on literature and cartography Richard Helgerson and John Gillies both give considerable weight to the formal correspondences between maps and literary texts.²⁸ In Helgerson's case these resemblances are mapped onto the more general common ground of cultural pressures. Helgerson is explicit in his focus on cultural 'forms' and is inclined to construe the politics of cartography in formal, generic terms. On the one hand, he regards Jacobean estate maps and country house poetry as broadly conservative in their centrifugal focus on manorial stewardship. On the other, he regards chorographies as proto-whiggish and politically centripetal; and projections of a nation composed of localised individuals.²⁹ In John Gillies's case, the general common ground underpinning particular, aesthetic resemblances between maps and literary works is shaped not just by contemporary political consciousness, but also by subconscious human impulses to stratify and thereby textualise space, marking the scene, the obscene, and so on. Gillies reads maps and texts for a 'poetic geography' which originates not in history but in human nature.

The most common relationship between maps and verbal texts discovered in recent scholarship is similarly formal and phenomenological. Most critics reach for a mobile, metaphorical definition of what maps and literary texts are and do which will accommodate and permit comparison. Both Tom Conley and Rhonda Lemke Sanford, for instance, identify early modern literary works which seek, like conventional cartography, 'to contain and appropriate the world they are producing in discourse and space through conscious labours of verbal navigation'.³⁰ Bernhard Klein, in turn, has argued that both literary and cartographic texts can be categorised as either static map or mobile itinerary, depending on the relationship they establish between reader and space.³¹ Like Gillies, Klein reads a 'semiosis of desire' in the formal characteristics of the new geography: its views from above and its all-encompassing atlases and globes.³² Like Helgerson he foregrounds the cultural politics apparently implicit in cartographic and literary form.

28. Richard Helgerson, *Forms of Nationhood: The Elizabethan Writing of England*, Chicago and London, University of Chicago Press, 1992; John Gillies, *Shakespeare and the Geography of Difference*, Cambridge, Cambridge University Press, 1984.

29. See especially Richard Helgerson, 'Nation or Estate: Ideological Conflict in the Early Modern Mapping of England', *Cartographica*, 30 (1993): 68-74.

30. Tom Conley, *The Self-made Map: Cartographic Writing in Early Modern France*, Minneapolis and London, University of Minnesota Press, 1996, p5, cited in Rhonda Lemke Sanford, *Maps and Memory in Early Modern England: A Sense of Place*, New York and Basingstoke, Palgrave, 2002, p13.

31. Bernhard Klein, *Maps and the Writing of Space in Early Modern England and Ireland*, London, Palgrave, 2001.

32. *Ibid.*, p35.

Above all, Klein traces in the common formal strategies of maps and texts the symptoms and the mechanisms of a pervasive 'mathematization of experience' estranging early modern subjects from the social experience of space.

All of these literary studies have made highly valuable contributions to a new cultural history of cartography. Yet they perpetuate the presumption of the most traditional, positivist histories that the primary function of maps, and of the geographic text in general, is to represent space. The danger in their tendency to read maps and literary texts in terms of abstract spatial analogies is that it formalises in advance our view of particular social processes. It assumes that spaces 'framed' by geometry or 'navigated' in verse felt to early modern readers much as they feel to us, and thereby naturalises the advent of 'modern' forms of spatiality and representation however much it may appear to mourn them. It cleans up the dirtiness of the early modern map. But where positivist and materialist critiques have blamed an excessive post-structuralism for these abstractions, a final and most telling critique of the new cartographic history blames an insufficiency.

In his critical introduction to Brian Harley's essays, self-confessed positivist J.H. Andrews finds Harley asking his reader to question the 'assumed link between reality and representation' but notes with relief that Harley draws back from the post-structuralist brink of finding nothing 'outside the text'.³³ Barbara Belyea, on the other hand, finds this hesitancy problematic.³⁴ To bring ornament to the centre of the map is to accept that maps, like other texts, do indeed - in Andrews's incredulous phrase - 'create noncartographic reality as well as representing it'.³⁵ And yet, Belyea points out, Harley's work on cartography consistently supposes a normative physical reality, politics, ethics and human subjectivity which cartography distorts and represses.³⁶ Whilst this supposition is in perfect harmony with the idealist, Kantian basis of Panofsky's approach, it does not sit well with the post-structuralism with which Harley tries to mix his iconology.³⁷

For Foucault and Derrida, Belyea observes, political power is not external to the text, and executed upon or through it, but is inextricable from, and a product of textuality and discourse.³⁸ Truth is not something which human subjects misrepresent and suppress through textuality and discourse, as Harley suggests in his readings of cartographic 'silence', but is a product of textuality and discourse themselves. As, for that matter, is the human subject. Maps do not simply 'hide' power in those margins which positivist scholars would have us believe are not part of cartography. Rather, they make it possible precisely in their marking of the boundary between centre and margins, truth and ornament, representation and reality.

Belyea's critique suggests that the characteristic slippage between practical and aesthetic we find in Harleyan readings of cartography is the product not of an over-estimation of representation and language, as materialists have suggested, but of a half-hearted post-structuralism which sees representation as the 'tool' of political agencies operating somehow

33. J.H. Andrews, *op. cit.*, p21.

34. Barbara Belyea, 'Images of Power: Derrida/Foucault/Harley', *Cartographica*, 29, 2 (1992): 1-9.

35. Andrews, *op. cit.*, p11.

36. *Ibid.*, p4.

37. *Ibid.*, p2.

38. *Ibid.*, p3.

beyond it. I would apply the same critique to recent readings of cartography and literature which have sought in phenomenology a refuge from Foucauldian pessimism and an idealised common ground beyond cartographic discipline.

For the phenomenological tradition in philosophy there is no possibility of Cartesian detachment and the 'cogito ergo sum'.³⁹ No possibility, that is, of a subject that might regard the world objectively and separately from the thinking self, and that might conceive of an objective space which is a condition of this world detached from the thinking self. Being, as Martin Heidegger put it, is always 'dwelling', or 'being-in-the-world', and the self, rather than being limited by physical boundaries separating it from the world, is constituted through such boundaries.⁴⁰ Phenomenology appeals for us to examine images, whether visual or literary, not as substitutes for an objective 'reality', but as the way in which we experience our world.

Whilst phenomenology is indebted to Kant for its sense of the mental mediation of space, it rejects the Kantian notion of space as an absolute category even of the mind. Space, to use Edmund Husserl's language, is 'intentional'; or, to use Heidegger's, imbued with 'care'. It is constituted and shot through with human negotiations, processes and desires.⁴¹ The best the philosopher can do is search, as Husserl does for geometry, for the essence of the human experience of a phenomenon: the sense it must have had for its first discoverers, with all the intervening overlay of history bracketed or reduced.

Much of the most influential cartographic theory and history written in the last few decades has taken a broadly Panofskyan view of representational space as symbolic, and thereby cultural. But it also shares the phenomenological conviction that lies behind Panofsky's work, articulated seminally for Panofsky by Ernst Cassirer; that the arrival of an abstract spatial consciousness separating the self symbolically from the world is an essential milestone in the evolution of human cultures. In its human absoluteness, mapping is viewed by most historians as a form of cognition and communication somehow prior to, beyond, and thereby merely analogous with language. In 1976 Arthur Robinson and Barbara Petchenik made what they regarded as the first attempt at a general theory of cartography, defining the 'communications model' in a text which remains influential.⁴² 'Mapping', they write, 'is basically an attempt at communication between the cartographer and the map percipient ... all maps have as their aim the transfer of images of the geographical milieu'.⁴³ Elsewhere, to the same effect, Robinson and Petchenik quote founder of cultural geography Carl Sauer: 'the map speaks across the boundaries of language'.⁴⁴ By the time Brian Harley came to write his introduction to the Chicago *History of Cartography*, another attempt at timely disciplinary synthesis, this Sauerian mantra needed no attribution. 'There has probably always been a mapping impulse in human consciousness', writes Harley in his opening paragraph, and he goes on to describe the power of maps to 'speak across the barriers

39. Mike Crang, *Cultural Geography*, London and New York, Routledge, 1998, p107.

40. *Ibid.*, p107.

41. *Ibid.*, pp108-10.

42. Arthur H. Robinson and Barbara Bartz Petchenik, *The Nature of Maps: Essays toward Understanding Maps and Mapping*, Chicago and London, University of Chicago Press, 1976.

43. *Ibid.*, p42.

44. Quoted in *ibid.*, p2.

45. J.B. Harley, '1. The Map and the Development of the History of Cartography', in J.B. Harley and David Woodward (eds), *The History of Cartography, Volume One: Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, Chicago, Chicago University Press, 1987, p1.

46. Jacques Derrida, *Edmund Husserl's 'Origin of Geometry': An Introduction*, John P. Leavey (trans), David B. Allison (ed), New York, N. Hays and Hassocks, Harvester, 1978, pp61-6.

of ordinary language'.⁴⁵

For all its insistence on an essential subjectivity and humanity, the phenomenologist's quest for the heart of the phenomenon remains an idealist one: an attempt to re-ground knowledge on something absolute and eternal. In recent years it has been subjected to a persistent post-structuralist critique, most prominently in the work of Derrida. Derrida brought this critique to bear specifically on Husserl's attempt to re-ground geometry on realities beyond history and language. It applies with equal force to the attempts made by cartographic historians and more recently literary critics to read in textual and cartographic images the traces of archetypal human experiences of space, apparent to any reader.

Husserl insists - 'obstinately', in Derrida's view - that the objectivity typified in geometry lies behind, and is the condition of possibility for language and history itself.⁴⁶ This insistence begs an archetypal Derridean question: if geometry is prior to language and history, and yet not absolutely ideal, why and how was it invented, and by what means might the pure sense of this invention be experienced and transcribed? Since language and history are the only media for either moment of invention, no phenomenology can give this question a satisfactory answer.

Derrida's question about the relationship between geometry and language matches and answers the Lefebvrian one. Language is neither prior to the human experience and representation of space nor posterior to it. Writing, geometry and practice are not analogous but inextricable and the same. A thoroughly post-structuralist critique of the new critical history of cartography suggests that its revolution has been incomplete. But it does not accept that we are wrong to 'read' when we do cartographic history, simply that we are wrong to read the map itself as an analogy or alternative to language and especially wrong to attempt intuitive readings of geometry and space.

Derrida's critique of phenomenology moves us beyond a post-Kantian divide between language and geometry, and towards a historicised conception of their relationship: a relationship fully acknowledged in the seventeenth century. Far from exploding history, it helps us do history properly. We cannot, as Husserl hoped, share the experiences of early modern subjects by imagining the geometries and other spatialities encoded in their texts. We cannot do this because these experiences are not extricable from history and language. And when we abandon this Husserlian quest and appreciate the written-ness of early modern geometries and geographies we find, in fact, that they were far from being what they seem intuitively to us. Far from being the symbolic form through which early modern subjects inevitably perceived their worlds, far from being the 'silent' ground, the naturalised basis for a 'disciplined' experience of space, the meaning of geometry and the map was contingent on a cacophony of rhetorics conditioning and negotiating their interpretation. As literary historians have suggested in analyses of those early modern meta-narratives that

accompanied the birth of the novel, these rhetorics were often simultaneously rhetorics of 'truth' - of the right way to represent - and rhetorics of 'virtue' - of the legitimacy of those individuals and communities who represent and are represented.⁴⁷ Moreover maps themselves were conceived not formally, as frames of or routes through 'space', but as gestures in rhetorical contests and negotiations.

CARTOGRAPHY AND RHETORIC

I want to ground my argument for the rhetorical nature of early modern cartography on a historicised understanding of rhetoric itself: something often missing in post-structuralist appropriations of the term.⁴⁸ The importance of the classical rhetorical tradition in European culture from the Renaissance to Romanticism is widely underestimated, principally because of its strangeness to post-Romantic habits of mind.⁴⁹ Classical theories of rhetoric established the habit of systematising the art of speaking for which the tradition would later become notorious. Aristotle distinguished three species of rhetoric in terms of their social function. The function of judicial rhetoric was to influence a judge's decision over past events by accusation or defence; the function of deliberative rhetoric was to influence a politician's decision over future events by encouragement or discouragement; and the function of epideictic rhetoric was to influence the good conduct of any citizen by praising virtue and mocking vice.⁵⁰ Further, argued Aristotle, all of these species of rhetoric should pursue three species of persuasion: teaching, delighting and moving.⁵¹ Finally, classical rhetoric divided the processes involved in rhetoric into the successive stages of invention (the identification of the correct commonplaces, figures of speech and tropes to use); disposition (planning and laying out the speech); and elocution (performing it).⁵²

Renaissance humanists promoted rhetoric as the definitive civic art, and the orator as the culture hero of the *vita activa*. The Renaissance orator was celebrated as a guide uniquely capable of navigating the virtuous course defined by Aristotle as lying always at the mean of two extremes: between pure truth and pure utility; between retired scholarship and the venality of the world.⁵³ Humanists recognised the need for any form of speaking or writing, including the scientific, not just to teach its reader, but to delight and move them - to 'draw' and 'winde' them in, in the words of one sixteenth-century theorist.⁵⁴ In sixteenth-century England, rhetoric came to enjoy an extraordinary prominence not just in Universities, but at the root of education. By 1575 there were 360 grammar schools in England in which pupils learnt from ancient and modern sources how to identify and use the figures and tropes of classical rhetoric.⁵⁵ In an age of print their teachers came increasingly to treat rhetoric as a written, as much as a spoken art, and theorists of literature such as Sir Philip Sidney followed classical precedent in treating literature or 'poesy' as a close relative or derivative of

47. Michael McKeon, *Origins of the English Novel, 1600-1740*, Baltimore, Johns Hopkins University Press, 1987.

48. See 'Epilogue: The Future of Rhetoric', in Brian Vickers, *In Defence of Rhetoric*, Oxford, Clarendon, 1988, pp434-479.

49. This case is made by Brian Vickers, *op. cit.*; Quentin Skinner, *Reason and Rhetoric in the Philosophy of Hobbes*, Cambridge, Cambridge University Press, 1996. I am extremely grateful to one of the anonymous readers of this article for their encouragement to develop further the Renaissance rhetorical context.

50. Vickers, *op. cit.*, p21; Skinner, *op. cit.*, pp42-5.

51. Vickers, *op. cit.*, p74.

52. Skinner, *op. cit.*, pp45-6.

53. *Ibid.*, pp154-5.

54. Quoted in *ibid.*, p89.

55. Vickers, *op. cit.*, pp257-8.

56. Skinner, *op. cit.*, p109.

57. See 'Plato's Attack on Rhetoric', in Brian Vickers, *op. cit.*, pp83-147; Quentin Skinner, *op. cit.*

58. Vickers, *op. cit.*, p266.

59. *Ibid.*, p284.

60. *Ibid.*, pp343-5; Skinner, *op. cit.*, pp188-97.

61. For examples of 'judicial' mapping see Clarence Winthrop Bowen, *The Boundary Disputes of Connecticut*, Boston, James R. Osgood, 1882.

62. For an excellent account of this kind of mapping see Sara Stidstone Gronim, 'Geography and Persuasion: Maps in British Colonial New York', *William and Mary Quarterly*, 58,2 (2001): 373-402.

rhetoric.⁵⁶

However much they might have been suspicious of the excesses of rhetoric and of Machiavellian perversions of its power, early moderns did not in general swallow Plato's argument that true knowledge must do without metaphors, or buy Hobbes's attempt to ground natural, civil and moral science on pseudo-mathematical deductive reasoning.⁵⁷ Instead they tended to regard truth, justice, public benefit and moral good as best revealed by processes of negotiation and persuasion, and to prize the Ciceronian skill of speaking *in utramque partem* (on both sides). Rather than regarding the rhetoric of early modern science as a guilty secret, as we are wont to do and as only the most anti-rhetorical early moderns saw it, it is more accurate to see rhetoric as the benchmark against which arts and sciences of more doubtful value - including mathematics and cartography - were obliged to prove themselves. It is worth remembering that rhetoric was not only given a superior place in the humanist curriculum to mathematics, judged a barbarously solitary and un-civic science, in some instances it actually displaced it.⁵⁸ But how might early modern cartography have been rhetorical?

It isn't necessary to reach for abstract notions of extra-linguistic cognition and communication to answer this question since the connection can be made concretely historical. Rhetorical theory placed considerable value on the visual as the perceptual register most intimately connected with the passions and therefore as a horizon to which verbal rhetoric must aspire. Moreover it treated visual images themselves as part of the arsenal of the grand style in rhetoric, ranged alongside the most potent figures.⁵⁹ Along with rhetorical theories of poesy, the Renaissance quickly generated rhetorical theories of painting. These matched rhetorical invention with the painter's selection of a novel, sometimes even 'far-fetched' subject, guaranteed to rouse the viewer's passions. Disposition was matched with the geometric process by which this subject was tempered, brought back within the familiar bounds of sound design, elocution with the painter's artful colouring and finishing of the work.⁶⁰

Like Renaissance paintings, early modern maps resemble rhetoric in kind. In fact their functions correspond far more closely than those of painting to the functions according to which Aristotle defined rhetorical species. Early modern maps were made most frequently, if often most ephemerally, in the judicial mode, commissioned by court authorities or by opposing parties to influence the negotiation of a just decision.⁶¹ They were also made in the deliberative mode, commissioned to persuade the powerful that a given action, or kind of action was both virtuous and profitable.⁶² Finally, many early modern maps were made, like poems and paintings, in the epideictic mode, to celebrate the honourable achievements of proud landlords and imperial nations.

In style, early modern maps range, like rhetoric, from the plain style of everyday estate management and the lawcourts, through the middle style

of armchair travellers' tales to the grand style of scholarly cosmography: of geographies inspiring heroic imperial endeavour, of the atlas and the globe. At their grandest, like the grandest style of rhetoric and painting, they arouse the reader's passions, bringing them specimens of novelty and strangeness, but tempering these passions through the familiar, domesticating logic of mathematical design. Understood as rhetorical, there is nothing strange in the 'bizarre congruence of the geometric and the mysterious' to be found in sixteenth-century atlases.⁶³ The exotic aspect of such geographies is not necessarily a form of distancing and 'aloofness': the expression of an innate human tendency to spatialise distinctions between the familiar and the foreign.⁶⁴ It is more a rhetorical appeal through wonder to the passions, marshalled through the rational logic of geometry.

Finally, if they are like it in kind, early modern maps are also like rhetoric in process. They take a piece of subject matter from the world and re-present it according to scholarly principles of good design and artful qualities of skill and discretion. The cartographer selects the places they represent as the orator or poet chooses their arguments or their stories. They make their mathematical measurements and cast them up as the orator lays their arguments out. They ornament, colour and fill in the details of their map as the orator embellishes their speech.⁶⁵

These are not exact or necessary correspondences - I make no absolute claims as to whether the colouring on a map corresponds meaningfully to metaphor in poetry, or to the performance of a speech. Neither, however, are they speculative associations with no basis in early modern culture. J.H. Andrews may be right, at least for the eighteenth and nineteenth centuries, when he judges modern cartography an intrinsically silent art: 'before about 1930, cartographers made few general pronouncements of any kind about their subject'.⁶⁶ But for a substantial part of the sixteenth and seventeenth centuries, cartography was distinctly noisy. Sixteenth and seventeenth-century mathematicians and geographers worked hard to advertise the parameters within which they wanted their work to be understood, and these parameters were distinctively rhetorical.

BETWEEN THE STUDY AND THE MARKETPLACE

The best-known aspect of early modern writing on mathematics and cartography has fuelled the idealist conception of a clean mathematical panopticism: a mathematics beyond rhetoric. But it is only one side of the story. Geography, claims mathematician and physician William Cuninghame in *The Cosmographical Glasse* (1559), 'delivereth us from greate and continuall travailes. For in a pleasaunte house, or warme study, she sheweth us the hole face of all th'Earthe, withal the corners of the same'.⁶⁷ Dedicated to Elizabeth I's favourite Robert Dudley, Cuninghame's treatise promises to teach its reader how to draw a map for 'Spaine, Fraunce, Germany, Italye, Graece, or any perticuler region: yea, in a warme and pleasaunt house,

63. Bernhard Klein, op. cit., p35.

64. See John Gillies, op. cit., pp28-30, on Elizabethan exoticism.

65. See Leonard Digges and Thomas Digges, *Pantometria*, London, Henrie Bynneman, 1571. This manual gives an account of the whole procedure of taking a survey which, like the Renaissance painting treatises discussed by Brian Vickers, appears to mimic the three stages of the rhetorical process.

66. J.H. Andrews, op. cit., p5.

67. William Cuninghame, *The Cosmographical Glasse*, London, John Daye, 1559, sig.A6r.

68. Ibid., p120.

69. Bernhard Klein, op. cit.

70. Denis Cosgrove, *The Palladian Landscape: Geographical Change and its Cultural Representation in Sixteenth-Century Italy*, Leicester, Leicester University Press.

71. William Cuningham, op. cit., sig.A4r.

72. Ibid, sig.A2r.

73. Ibid., sig.A2r.

74. William Leybourn, *Cursus Mathematicus*, London: Thomas Basset, Benjamin Tooke, Thomas Sawbridge, Awnsam and John Churchill, 1690.

75. Ibid., p47, p48.

76. Thomas Hood, *A Copie of the Speache Made by The Mathematicall Lecturer ... at the House of Thomas Smith*, Amsterdam, Theatrum Orbis Terrarum, 1974.

without any perill of the raging Seas: danger of enemies: losse of time: spending of substaunce: wearines of body, or anguishe of minde'.⁶⁸ Cuningham's offer to place his patron and his reader above the world beyond travail, outside even their bodies, represents by far the best known aspect of the early modern 'cartographic transaction'.⁶⁹ It is a manifestation of that 'Euclidean ecstasy' which infused early modern scientific culture from the sixteenth century onward, inspiring aspirations for a new dominion over nature and humanity.⁷⁰ It looks much like the Husserlian crisis which sees the European self finally gaining perspective on its world. Yet equally common in mathematical writing are figures and rhetorics of a more equivocal nature: figures which dirty somewhat the clean lines of geometric discipline.

Cosmographia also tells of maps which Alexander, 'the mighty Conqueroure,' would have made of the country 'with which he would warre,' and would have 'hanged in open markets for all men to behold, wherby the Capitaines did forsee, and seke out where was the easiest places to arrive, and the Souldiors allured with the commodities of the Countries, were made the willinger to the thinge'.⁷¹ These maps take us far from the scholar's study and into a world of strategies, commodities, material pain and pleasure. Moreover, alongside alternate images of scholarly detachment and worldly engagement, Cuningham presents images which equivocate in typical rhetorical fashion between the two.

In an account derived from Ovid's *Metamorphoses* Cuningham tells of Daedalus 'that excellent Geometrician', who saw the 'Monster Ignorance' with 'the eyes of knowledge' and, with wings prepared '(through Science aide)', flew 'oute of hir mooste filthy Prison', 'her lothsome Labyrinthe', 'Ascending to the Sterrye Skie'.⁷² Knowledge, concludes Cuningham, shuns ignorance, brings man closer to God and permits the invention of arts through which man has 'sought out' worldly 'Secretes'.⁷³ But we and every imaginable contemporary reader of Cuningham's treatise know two things that complicate this story: that Daedalus's son Icarus paid a terrible price for starry soaring in the flight from Crete, and that the labyrinth from which the pair escape was built by Daedalus himself. Science, it appears, is both escape route and trap, both of the world and out of it. All the more need, then, for a guide like Cuningham to lead us rhetorically along the Daedalean middle path.

Cuningham's invocation of the Daedalus myth compresses into almost emblematic form the claims of a wide array of mathematical popularisers and publicists that mathematics and its various derivations could do what rhetoric did. It could teach, delight and move. It could tread a middle path between virtue and profit. Exemplary here is the corpus of mathematical writer William Leybourn, which ranges from the plainest, most practical texts, to expensive subscription volumes designed for wealthy consumers. In *Cursus Mathematicus* (1690), which falls into the latter category, Leybourn fashions a mathematics neither scholarly nor pragmatic, but somewhere in

between: a mathematics of the rhetorical middle style, designed to please as well as teach.⁷⁴ This book, whose reader must be ‘*Mathematically affected*’, looks not merely to ‘agree with his *Stomach*’, being profitable, but also to ‘please his *Palate*’.⁷⁵ Exemplary too is a speech given in 1588 by Thomas Hood to a city audience composed in part of the militia got up to counter the Armada.⁷⁶ Hood’s speech appeals to his audience both as greedy merchants and as lofty scholars, and fashions a mathematics equivocal between these apparently polar interests.

That mathematicians were obliged to advertise their discipline in this tentative manner should remind us of its doubtful status in the sixteenth and seventeenth centuries. In Francis Bacon’s words, ‘The *Labyrinth* is an excellent Allegory, whereby is shadowed the nature of Mechanicall sciences ... for Mechanicall arts are of ambiguous vse, seruing as well for hurt as for remedy, and they haue in a manner power both to loose and bind themselues’.⁷⁷ This rather equivocal view of scientific artfulness sits uncomfortably with Bacon’s place in early modern cultural history. Yet Bacon’s equivocation and the ‘excellent’ labyrinth allegory itself are entirely characteristic of the ambivalence of Protestant humanism and of its accomodation in the rhythms of classical rhetoric.

DISCIPLINE AND RHETORIC

Francis Bacon is famous for his articulation of a radical humanism which shifted the origins and ends of science from idealist contemplation to the improvement of the human condition, and which subjected the material world to mathematical abstraction and manipulation: to ‘discipline’. Bacon regarded mathematical reduction as first principle of a rigorous intellectual engagement with and improvement of the material world, recommending “that all natural bodies be, as far as is possible, reduced to number, weight, measure, and precise definition”.⁷⁸ The Baconian philosophy of discipline and improvement was enthusiastically embraced by Puritans and revolutionaries envisioning a new dominion over nature, forming, in Charles Webster’s words, almost ‘the official philosophy’ of the English revolution.⁷⁹ Neither was Baconianism exclusive to Puritan social networks, however much the soil of Puritanism may have nourished the spread of Baconian ideas.⁸⁰ It is widely viewed as the ethos informing both the mathematisation of seventeenth-century geography, and the economic reformism and imperial expansionism for which this new world view is held to have served as instrument and ideology.⁸¹ Yet even the most pragmatic, worldly streams of Puritan and Baconian thought, equating truth and virtue with utility, contended over a long period with a residual discourse of Calvinist asceticism, associating practical art and economic individualism with moral and social corruption.

Treatises promoting improvement, economic reform and the colonisation of waste American soil were matched throughout the mid-seventeenth

77. Francis Bacon, Viscount St Albans, *The Wisedome of the Ancients*, Sir Arthur Gorges (trans), London, John Bill, 1619, pp93-94.

78. Quoted in Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626-1660*, London, Duckworth, 1975, p351.

79. Charles Webster, op. cit., p25.

80. See Nicholas Tyacke, ‘Science and Religion at Oxford before the Civil War’, in Donald Pennington and Keith Thomas (eds), *Puritans and Revolutionaries: Essays in Seventeenth-Century History presented to Christopher Hill*, Oxford, Clarendon, 1978, pp73-93. Where Charles Webster stands in a still flourishing tradition tracing the rise of experimental science to Puritan social origins, Tyacke contests this thesis, pointing to vigorous experimentalism amongst Royalist groups in the Universities and arguing that there is no positive correlation between Puritanism and science.

81. See, for instance, Bruce McLeod, *The Geography of Empire in English Literature, 1580-1745*, Cambridge and New York, Cambridge University Press, 1999.

82. See, for instance, Robert Powell, *Depopulation Arraigned, Convicted and Condemned, by the Lawes of God and Man*, London, R.B., 1636; John Moore, *The Crying Sin of England, of Not Caring for the Poor...*, London, Antony Williamson, 1653.

83. David Armitage, 'Literature and Empire' in Nicholas P. Canny (ed), *The Oxford History of the British Empire, I: The Origins of Empire*, Oxford, Oxford University Press, 1998, pp109-10.

84. See P.D.A. Harvey, 'English Estate Maps: Their Early History and their Use as Historical Evidence', in David Buisseret (ed) *Rural Images: Estate Maps in the Old and New Worlds*, The Kenneth Nebenzahl, Jr Lectures in the History of Cartography, Chicago and London, University of Chicago Press, 1996, pp27-61; Sarah Bendall, 'Estate Maps of an English County: Cambridgeshire, 1600-1830', in David Buisseret, op. cit., pp63-90.

85. Fulke Greville, Baron Brooke, 'A Treatise of Monarchy', in *The Remains*, G.A. Wilkes (ed), London, Oxford University Press, 1965, book IX.

century by sermons and print diatribes denouncing individualism and acquisitiveness.⁸² Although the tide of legislation began to turn in favour of enclosure in the mid-seventeenth century, supported by Baconian discourses valuing utility and general benefit over custom, the customary rights of common users, whether English or Native American, were widely argued. The perception persisted throughout the seventeenth century that colonies, in particular, threatened the moral and material economies of the commonwealth, diverting the attention of the nation's guardians to the mirage of foreign gold when it should be focussed on the stewardship of their own immediate charges.⁸³ Early moderns felt as anxious about the binding, loosening forces of economic change as they did about the arts that might forward it. It is this anxiety that haunts the 'excellent allegory' of the labyrinth and that should oblige us to reconsider our view of mathematical 'discipline' in the seventeenth century.

In the light of a sustained ambivalence about economic individualism and reform, it should be unsurprising that much seventeenth-century geography conveys a mixed message about what is virtuous in the use of land, and what is true in representing it. Close-grained archival research has demonstrated that traditional discursive and court-based practices of land management and representation co-existed throughout the seventeenth century with the new arts of mathematical surveying and cartography.⁸⁴ Such research suggests that we may be misguided if we treat those expensive, ostentatiously mathematical maps conspicuous amongst seventeenth century survivals as symptomatic of a widespread 'mathematization of experience'. Moreover even where mathematics did flourish, it played a rhetorical role, connoting balance and constraint, the middle path between custom and reform; the study and the marketplace; liberal virtue and worldly profit. If seventeenth-century space was disciplined, then mathematical discipline was not the limit and the end of rhetoric, the advent of a silent dawn of capitalist and imperialist system; but was itself a species of rhetorical negotiation.

An implicitly or explicitly mathematical and geographic language of design, surveying and reduction was common currency amongst seventeenth century reformers - advocates of commerce, agrarian improvement and colonisation - for whom it served the rhetorical function of negotiating between virtue, grace and providence and the chaotic energies of history and commerce. We can see this mathematical language at work in a wide variety of texts negotiating the meaning and value of controversial capitalist and colonial enterprises, and of economic artfulness in general. Amongst these, maps take their place.

A rhetoric of mathematical balance and constraint is at the heart of an argument made by Jacobean courtier Fulke Greville for the benefits of trade.⁸⁵ 'A Treatise of Monarchy' (composed c.1610) was one of five long verse treatises, all of which negotiate the same rhetorical middle path between a Calvinist pessimism, which shrinks in horror from man's worldly and

intellectual ambitions, and a humanist optimism which sees redemption in the artful ordering of government and society.⁸⁶ Greville cannot clean commerce of its traditional taint of wasteful luxury: of the toys on which prodigal sons waste their father's wealth, defaulting on their responsibilities of patriarchal stewardship. But he finds in 'art' itself the most certain guarantee that the products of artful commerce will not corrupt. The core of such artistic virtue he figures in explicitly mathematical terms:

86. Matthew Woodcock, "The World is Made For Use": Theme and Form in Fulke Greville's Verse Treatises, *Sidney Journal*, 19, 1/2 (2001): 143-59.

Yet must there be a kynde of faith preserv'd
Even in the commerce of the vanitie,
That with true arts their marketts may be serv'd,
And credit kept to keape them greate, and free;
Weight, number, measure trulie joyn'd in one,
By Trade with all states, to inrich our owne.⁸⁷

87. Fulke Greville, *op. cit.*, p132.

Mathematics serves here to constrain the threat of luxurious individualism by generalising its benefits. '[I]n States well tempered to be rich', writes Greville, 'Arts be the men's, and men the Prince's are; / Forme, matter, trade so worckinge everie where, / As government may finde her riches there'.⁸⁸ So long as their individual artfulness is tempered, Greville urges, kings should not see competition in the self-advancement of the skilful artisan and tradesman:

88. *Ibid.*, p132.

Wherefore with curious prospect theis prowde Kings
Ought to survey the commerce of their lande;
New trades and staples still establishinge,
So to improve the worcke of everie hand.⁸⁹

89. *Ibid.*, p129.

Greville's rhetoric of mathematical tempering, of confident prospects which 'survey' and master a landscape of burgeoning individualism and improvement, typifies the public discourses of enclosure and of American colonisation, both of which were highly controversial enterprises in the seventeenth century. Whilst mathematical surveying for pragmatic purposes was remarkably slow to evolve in America, a public discourse of balance and proportion frequently drew upon mathematics, and in some instances generated actual maps. The best known examples of a conspicuously mathematised and thereby 'disciplined' American 'space' were not, as Brian Harley and others have consistently suggested, expressions of a proto-Enlightenment culture of systematic domination, but were more characteristically gestures in an anxious rhetoric of self-constraint: attempts to negotiate contemporary scepticism and anxiety about the virtue and the benefit of colonial expansion.

An anonymous New England tract titled 'Essay on the Ordering of Towns' (c.1635) seeks to establish 'comfortable Communion' in the embryonic Puritan community through a plan 'square 6 miles euery waye. The howses

90. Anon., 'Essay on the Ordering of Towns', *Winthrop Papers*, 5 vols, Boston, Massachusetts Historical Society, III (1943): 182, p181.

91. *Ibid.*, p182.

orderly placed about the midst, especially the Meetinghouse, the which we will suppose to be the Centor of the wholl Circomference'.⁹⁰ Geometry here is neither simply a pragmatic mode of laying out the standard town, nor does it simply clear the land for private property. Rather it moralises the expansive work of settlement through limitation. Like Fulke Greville, the anonymous author of the essay is certainly preoccupied with 'Improvement', regarding it as a 'principall Condicion of that Grand Couenant assigned' to man by God.⁹¹ Yet at the same time the author assures his reader that all 'within Compas of the wholl towne' will be 'bownd with the suerst Ligaments'; each man limited to 'his due proportion' (184, 183).

This mathematised morality of compassing and proportion was re-invoked where New England towns began to test their bounds. In 1667 the residents of the southern, Chebaco district of Ipswich town petitioned Massachusetts General court successfully for parish status, supporting their application with a plan (Fig 1). The plan showed the proposed site for a

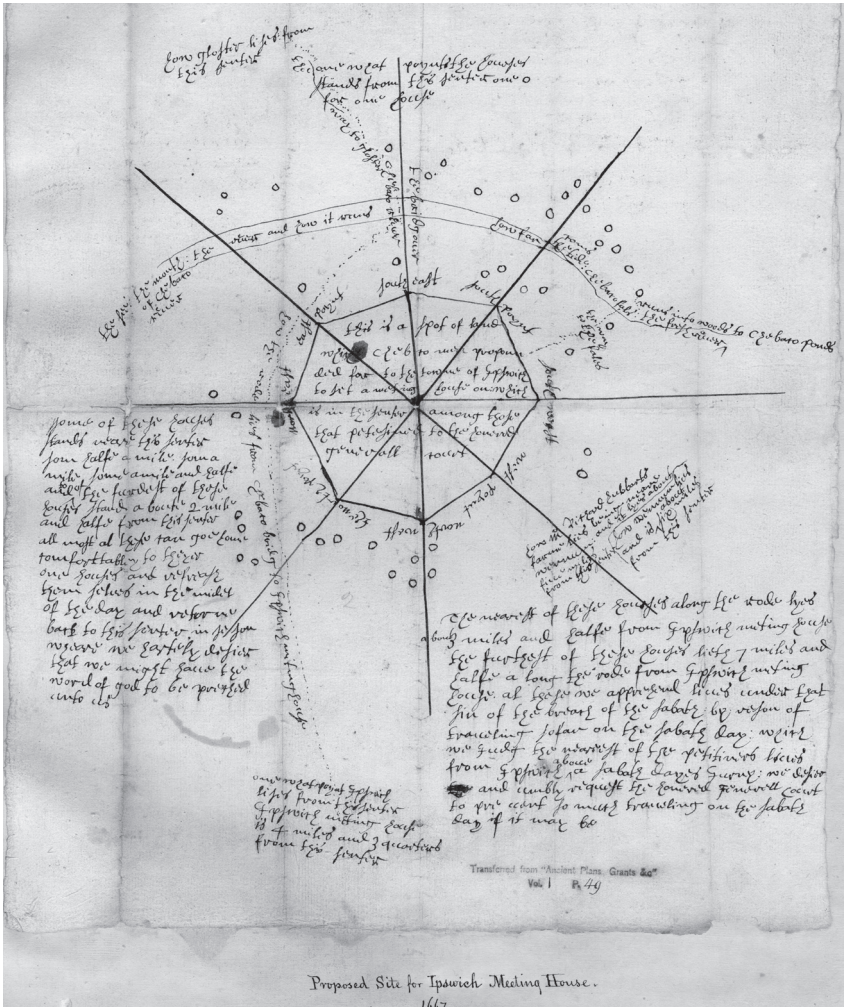


Fig 1, Unknown draftsman: Map of Chebaco, Massachusetts Archives Collection Third Series (v.1 p35), 1667. Reproduction courtesy of Massachusetts Archives

new meeting house at the center of an octagonal shape. This geometry conveyed a distinctly spatial, and at the same time a distinctly moral rhetoric. It was designed to demonstrate that none of the houses of the new parish would be more than two and a half miles distant from 'comfortable Communion', whereas some of them were currently seven and a half miles distant from the Ipswich meeting house. In the first histories, travelogues and cartographies of New England the rhetorical oscillation between expansion and limitation made graphic in the Chebaco plan is played out on a larger scale. This oscillation, rather than the confidently expansionist trajectory across a blank Cartesian plane, is the true rhythm of American improvement.

MIDDLE MEN

Cartographic rhetoric served the Protestant-humanist and Puritan cultures of sixteenth and seventeenth-century England as a means of negotiating the problematic status of artfulness, profit and the world. It also allowed mathematicians and geographers themselves room for manoeuvre: for self-fashioning.

Early modern mathematicians and geographers who published to promote their knowledge and their arts typically hedged their bets, like William Cuninghame, between liberal scholarship and profit and between the study and the marketplace. They wanted their readers to believe that they and their arts could do what rhetoric did: could steer a middle course between individual pleasure/profit and public benefit; could teach and yet also delight; could weigh the pros and cons; the wrongs and rights of a subject and a course of action; and could draw or persuade a reader and an audience to see things in the just-est, true-est and most virtuous light. The Harleyan, New Historicist account of early modern cartography sees it as clean and disciplinary, intolerant of the slightest departure from impersonal, mathematical authority. Yet seventeenth-century geographers make these departures remarkably conspicuous. Exemplary here is the Virginia colonist John Smith, who made clear both in the margins of his *Map of Virginia* (1612), and in the narrative account that accompanied it, that he had relied upon the help of Indian informants.⁹² Like other colonial cartographers, who variously boasted of surveying with a 'Rod cut out of the Hedge', and of leaving their 'compasses at home', Smith advertises his capacity to cope without a cleanly disciplined perspective, commenting on another map: 'Thus have I walkt a wayless way, with uncouth pace, / Which yet no Christian man did ever trace'.⁹³

Pragmatic, dirty geographies such as these were intended to thicken out the cartographic text, reminding the commissioners of colonial maps that their view from the panoptic mathematical 'study' of cartographic consumption was impotent without the mediating agency of the tough, experienced surveyor. In the language of classroom mathematics they present

92. Captain John Smith, 'A Map of Virginia', in *The Complete Works of Captain John Smith (1580-1631)*, Philip L. Barbour (ed), 3 vols, Chapel Hill, University of North Carolina Press, 1986, I, p151.

93. John Love, *Geodaesia; or, The Art of Surveying and Measuring of Land Made Easie*, London, W.Taylor, 1715, 2nd edn; first published 1688, *Appendix*, p7; William Wood, *New England's Prospect*, London, John Bellamie, 1634, p70; Captain John Smith, *The Generall Historie of Virginia, New England, and the Summer Isles*, in *The Complete Works of Captain John Smith (1580-1631)*, Philip L. Barbour (ed), 3 vols, Chapel Hill, University of North Carolina Press 1986, II, p107.

not just solutions, but also the 'work' it cost to produce them. They construct geographers as mediators in the rhetorical tradition between their readers, patrons or clients and a dangerous, doubtful, sinful world. And they remind us that a mathematics which truly conformed to the Husserlian ideal, with all its historical and cultural residues reduced, would be as empty and as meaningless as the disciplined spaces of Brian Harley's maps. To have agency and meaning, as both Bacon and Derrida have recognised, mathematics must be wrapped in the binding, loosing labyrinth of language.