

Introduction

"The bridge is not supported by one stone or another," Marco answers, "but by the line of the arch that they form."

—Italo Calvino, *Invisible Cities*

Shape and space inhabit language: language of persuasion, beauty, inspiration, and the everyday. They direct our line of reasoning; they help us find our angle of approach; they curve through our discourse; they lead us to the point. Geometry, the measure of space and of form within space, is part of language's body. It is the skeleton of sentences, the marrow of words. By peering through language's skin recurring shapes of a geometric nature emerge, like the fractal branching of blood vessels or the bilateral symmetries of ribs and appendages. They are the sublime and the monstrous geometries building and maintaining the literary body.

Nature's patterns fill the world in which we live: the Fibonacci series of seed-packing in sunflowers and daisies, hexagonal beehives and snowflakes, the golden ratio of nautilus shell chambers, concentric circles on a disturbed lake, the perfect sphere of a soap bubble. We imitate this geometry in our art, music, and architecture, and express it in the symmetry of our own bodies. Geometry likewise lies beneath the content of our writing. Language has a verbal geometry, and writing necessitates a crafting of space. Geometric space and form are implicit in language's body, and geometry can be used as a tool to enhance the powerful modes of communication of which language is capable. While many authors over the course of literary history have noted and consciously elaborated the relationship between geometry and language, few have done so as comprehensively and explicitly as the sixteenth-century polymath Giordano Bruno.

Giordano Bruno: philosopher, poet, playwright, mnemonist, and magus. He managed to impress and inspire, as well as infuriate and frighten, royalty, scholars, clergy, and laymen alike. He spent time at Henry III's court in Paris, Queen Elizabeth I's court in London, and Emperor Rudolf II's court in Prague. He taught mathematics, rhetoric, and the art of memory. A prolific writer, he composed nearly fifty texts between 1582 and his imprisonment by the Inquisition in 1592 and execution at the stake in 1600 as an "unrepentant heretic." But with all that Bruno was, has been thought to be, or has been made to be, at his core he was a poet and an architect of ideas. His crafting of language and crafting of ideas are intimately related in the way they exploit highly symbiotic systems. Bruno made geometry speak and language display. The commerce between symbolic and linguistic lexicons in the Renaissance gave Bruno much to work with, but it was Bruno, more than any other thinker of his time, who gave such commerce life.

To describe the world around him, its qualities and vicissitudes, Bruno forged a network of figurative vocabularies—of number, shape, space, and word—as if to say that no notational system on its own had the ability to represent the truths and infinitude of the universe in its entirety. The best possible understanding of the universe, Bruno would have us believe, only happens when these various systems are united. This unity forms the lexicon of Bruno’s “geometric rhetoric”: a rhetoric in the classical sense of the term—an art of persuasion—although notably different from that presented in the codified treatises of Aristotle, Cicero, Quintilian, or Ramus.

Bruno’s geometric rhetoric is a reflection of the philosophical notions it aims to present: it persuades a reader to think “infinitely” as it describes the nature of the infinite; to see the paradox of writing about paradox; to experience the possibility of language’s ability to denote the ineffable. For Bruno to “write about” the infinite, the paradoxical, and the ineffable, he needed a style that enabled him to “write with” infinity, paradox, and ineffability. From his long lists parodying the torments of the Petrarchan lover to his vastly permutable mnemonic strategies, Bruno was a craftsman of the language of space and the space that is implicit within language. He used symmetries, proportions, and measures to give his language rhetorical power. Geometry served a creative function for Bruno’s writing: it was a *poiesis*, a “making” in the literal sense of the word, similar to that of Plato’s demiurge, the principles of Pythagoras’ *tetraktys*, and Johannes Kepler’s *facultas formatrix*. Bruno’s geometric rhetoric attempted to figure out the universe through configuring it, with a multiplicity of spatial and linguistic “figuratives.”

Bruno wrote during a dramatic moment in Italy’s intellectual history. Humanism had glorified human reason and free will, emphasizing man’s place at the center of the universe. Copernicus’s theories, and later the findings of Galileo and Kepler, displaced humanity from that center and challenged both Christian and humanist doctrines regarding the order of the world around them. The Church fought to retain the authority threatened by both movements. Many among the educated class familiar with esoteric learning, like Bruno, looked to locate and empower themselves through spatial manipulation and symbolic permutation, such as memory theaters, encyclopedias, kabbalah, natural magic, alchemy, and searches for the “perfect language.” They believed these figurative nomenclatures and combinatoric systems helped orient the mind’s approach toward the workings of the cosmos and the Divine. What individuates Bruno from his contemporaries, however, is that not only did he make explicit use of multiple figurative systems to grasp the complex nature of the universe, but he also used these systems to reveal the ultimate futility of all human systems to achieve true understanding of its nature. In Bruno’s gnoseology, there is an asymptotic movement toward “the true,” but never its complete attainment. The mysteries of the natural and celestial worlds appear merely as shadows to our minds. The pursuit of true knowledge—simultaneously painful and joyful that it is—is the pursuit of something that lies beyond our grasp. It is the very space,

form, and direction of this journey to Truth that Bruno's writing attempts to represent and enact.

In his study of the symbol of the circle in the Western literary and philosophical traditions, Georges Poulet cites Bruno as one of the most "circle-obsessed" thinkers of the Renaissance, which is saying a great deal given the importance of the circle/sphere to the philosophy, theology, physical science, and aesthetics of that time.¹ In fact, Bruno's philosophical dialogues and comedy, as well as his works on the art of memory, magic, and mathematics, are brimming with circles. They appear in his cosmology of the infinite, in his notion of the *minimum's* basic form, in his physical intuition about the nature of motion, in his memory wheels, in his web of magical *vinculi* linking the celestial and terrestrial worlds, and in his view of knowledge as a process without end.

Bruno's writing indeed contains verbal patterns that signal an unusual sensibility to the shape of space—whether of the heavens, between people, on a page, or of one's mind. Not only the circle, but also various kinds of lines, angles, curves, and points participate in the articulation of his thought. His language not only speaks about shape and space, but molds and models it. It is the aim of this book to show where and how geometric forms appear in Bruno's language, and why it is important as readers of Bruno, as well as readers of literature in general, to be able to see language's implicit geometry.

To understand Bruno's geometry is to know the mathematics he embraced and opposed. The Greek mathematical texts recovered by the humanists in the fifteenth century had been variously translated and made accessible. The one-point perspective of Leon Battista Alberti was evolving into a Baroque multiplicity. There were breakthroughs in algebra by François Viète and Girolamo Cardano. Tycho Brahe's trigonometric tables and Kepler's calculations gave elliptical paths to the heavenly bodies. And there continued to be, simultaneously and at times symbiotically, the mystical-magical line of thought that manifested in mathematics through numerology, combinatorics, cryptology, and the desire to make the natural world and all in it fit into ideal Platonic shapes and patterns.

In order to speak of a "geometry of language," one has to know something of the language of geometry. To speak of Bruno's particular geometry of language, one needs to take into consideration his mathematical works (*De somnii interpretatione*, 1586; *De Mordentii circino*, 1586; *Articuli centum et sexaginta adversus huius tempestatis mathematicos atque philosophos*, 1588; *Camoeracensis acrotismus*, 1588; *Praelectiones geometricae*, 1591; *Ars deformationum*, 1591; and his three Frankfurt poems of 1591: *De triplici minimo et mensura*; *De monade, numero et figura*; and *De innumerabilibus, immenso et infigurabili*), as well as the mathematical texts and traditions Bruno would have known. While never a dogmatic adherent to any system other than his own, Bruno drew most of his mathematical knowledge from the works of ancient authors such as the Pythagoreans, Euclid, Plato, and Aristotle. He was largely uninterested in later commentators and the mathematicians of his time, opposing the calculations and measurements that required approximation. For Bruno, this

abstract mathematics was far from the natural, celestial, and human worlds. As we will see in Chapter 2, Bruno's issues with mathematics led him to a certain set of obstacles and dilemmas that inspired him to create a new kind of a mathematics, a *mathesis*.

Giordano Bruno and the Geometry of Language does not purport to offer a historicization of Bruno's geometry, nor does it analyze or critique Bruno's mathematics as either a mathematician or historian of mathematics would. Instead, it considers a number of geometric figures that recur graphically and metaphorically in Bruno's writing and are of central importance to his thought as a whole. In order to keep the focus on the visual, spatial "figurality" of Bruno's language, two large topics have been excluded that are arguably related to any interdisciplinary discussion of geometry: music and time. Questions of proportion, harmony, and progression will be mentioned, but they will not enter into this study of his geometric rhetoric.² And although I will be discussing the *Candelaio*, I will be looking only at its content and rhetorical language, leaving for others the questions of how space, form, and spectatorship relate to Bruno's stage. While the main goal of this study is to elucidate the spaces and forms that inform Bruno's philosophy and are expressed in his writing, this book is also an invitation to continue individuating the conceptual spaces and forms that, I believe, live and grow within all literature.

The Selection of Texts, and the Book's Methodology and Organization

Bruno's Latin works on memory, magic, metaphysics, and mathematics are filled with passages that utilize complex techniques of rhetoric, poetics, and narrative, but it is his works in Italian—his comedy and his six philosophical dialogues—that are his most literary pieces. It is for this reason, as well as for concision, that I have selected for analysis the *Candelaio* [*The Candle Bearer*] of 1582, and two of his Italian dialogues: *De gli eroici furori* [*The Heroic Frenzies*] of 1585 and *La cena de le Ceneri* [*The Ash Wednesday Supper*] of 1584.

I have organized this book into five chapters ("Axioms," "Foci," "Lines," "Angles," and "Curves") and a conclusion entitled "The Point." Over the course of my research I have come across a number of books that resemble this organization, but there are two in particular that I would like to cite, as they impressed upon me the power of a shape-informed Table of Contents: George Hersey's *Pythagorean Palaces* ("Point," "Line," "Plane," "Solid") and Tyler Volk's *Metapatterns Across Space, Time, and Mind* ("Spheres," "Sheets and Tubes," "Borders," "Binaries," "Centers," "Layers," "Calendars," "Arrows," "Breaks," and "Cycles").³

A note about the progression of the chapters from "lines" to "angles" to "curves" is due. The order is an allusion to the widely held Renaissance belief that the circle (or, in three-dimensions, the sphere) was the most perfect of forms, and that all other figures were inevitably deficient in comparison. A straight line was less perfect than a triangle, a triangle less perfect than a square,

a square less perfect than a pentagon, a pentagon less perfect than a hexagon, and so on until a figure reached “-gon-less” perfection—in other words, it had become a circle. While the order of the texts themselves do not present a “progression toward perfection” from the *Candelaio*, to the *Furori*, to the *Cena*, the geometric figures and rhetoric that these chapters consider do, in fact, advance from the satirical to the sublime. They move toward the evermore difficult to compute, and the evermore transcendent and “irrational,” in the sense of a circle’s precise area. Before entering into the close, geometric readings of these three works, however, the book first provides two chapters that prepare the reader for the critical apparatus utilized in Chapters Three, Four, and Five, offering a genealogy of ideas about spatial form in literature, and locating Bruno in historical and critical contexts.

Chapter One, “Axioms,” which provides an overview of the evolving concepts of geometric space and form that have impacted the literary imagination throughout Western history, is necessarily abbreviated and selective due to its function as an orientation device within a massive sea of material. My argument that an underlying, ontological bond exists between geometry and literature has been inspired by numerous, diverse sources. I have drawn much from the readings of literature and culture by Roman Jakobson, Georges Poulet, Paul Valéry, and Gérard Genette, as they have posited some of the most suggestive ways to think about space and form within a literary text. My geometric reading is in part, thus, based in a structuralist critique, albeit a modified one focusing on contextualizing philosophically the figurative morphology of rhetorical tropes in a text, utilizing neither the tools nor the terminology of linguistic or semiotic theory. A geometric reading looks at a text as neither a synchronic nor a self-contained system. Instead, it takes into account the importance of the author, reader, and historic context by accepting that mental constructs of space and form vary respectively with what the author and reader know or think about the nature of space and form, and with their particular historical moments. A geometric reading recognizes that literary texts are ambiguous and provoke multiple interpretations; that the master narrative and notion of “original” are only two of many possible stories a text can tell. As this analysis of Bruno’s works will show, authors can use (and have used) language’s spatial malleability, dimensionality, duplicity, and opaqueness to demonstrate a theory of meaning, and/or to encourage readers to explore, discover, or construct their own meanings.

While many and various discussions outside of structuralist, poststructuralist, and deconstructivist criticism have been important to the development of my notion of a geometric reading, among those I would like to signal are Michel Serres’s investigations into the history of science, language, and the arts; Giovanni Pozzi’s studies on visual poetry; Gaston Bachelard’s phenomenology of space; Fernand Halpin’s analysis of the poetic structure in descriptions of the cosmos; Benoit Mandelbrot’s theory of the fractal geometry of nature; interpretations of space by architects Sigfried Giedion, Lionel March, Kenneth Frampton, and Anthony Vidler; mathematicians D’Arcy Wentworth

Thompson, François Le Lionnais, and Jay Kaproff's articulations of the geometric links between science and the arts; and the mathematical manipulations of literature by the authors of the OuLiPo.

Chapter Two, "Foci," is also a kind of compass or weathervane, helping in this instance to stake out my ground on the uneven topography of Bruno Studies. The first section of this chapter, "Brunophilia and Brunophobia," examines how Bruno the individual and Bruno the thinker have been variously perceived over the centuries, pointing to the elements in his thought and in his person that have stimulated wildly diverse reactions and interpretations, and contemplating what such multiple perspectives convey about his linguistic and philosophical expression. The second section provides an outline of Bruno's relationship to and unique theories of mathematics. The third section joins his thoughts on geometry to his thoughts on the shape and purpose of language. As such, it sets the stage for the discussion in the following chapters of how geometric figurations emerge in his literary production and support his philosophical notions of space and form.

Chapters Three, Four, and Five ("Lines," "Angles," and "Curves") are the book's core, performing the geometric readings of Bruno's writing anticipated by the earlier chapters. Each of these three chapters focuses on one of Bruno's Italian works (the *Candelaio*, *Furori*, or *Cena*), and isolates one category of geometric form in order to discuss how that form expresses itself in the text's figurative language. Through pairing geometric figures with rhetorical figures and analyzing what the convergence of these figuratives conveys, much about Bruno's philosophy surfaces. I pair, for example, a rectilinear line with the long lists of *brachylogia*; an angle with the axial form of *chiasmus*; and the circle with *circumlocution*. These dual figurations of language reveal, respectively, doubly reinforced stances on concepts such as the limits of pedantic knowledge, the theory of *coincidentia oppositorum*, and the co-existence of an infinite universe and a finite minimum. As an exhaustive treatment of *all* the tropes that could fall under a given category of geometric shape would result in a massive and unreadable effort, I have selected only a sampling of rhetorical figures that conceptually display the simple geometric figures of line, angle, and curve. Many highly geometric tropes—such as the centripetal *zeugma*, the part-for-the-whole *synecdoche*, or even the obvious *parallelism*—cannot be treated amply within the limits of this study, but do deserve further analysis.

The concluding chapter, "The Point," is the place in which my discussion of Bruno's "geometry of language" has its end and, more importantly, its beginning. The point is the geometric form from which and to which lines, angles, curves, and all geometric forms, according to Brunian philosophy, depart and return. Bruno also held the geometric point to be the geometric equivalent to the physical atom and the monad: the *minima* from which form, matter, and number are born and will, ultimately, return. "The Point," as one would expect, restates this book's fundamental argument: the importance of reading Bruno's writing—and all literature—with an eye for geometry.

Geometry and language are both means to describe, to measure, and to

name. The figurality of Bruno's language illustrates a concerted effort to express and reflect the interconnection between symbolic systems. It is also a demonstration of how these systems supplement each other in engaging topics as ineffable as Divinity and infinity. While Bruno is far from alone in using geometric metaphors and methodologies in his literary and philosophic writing, he was certainly one of his age's most welcoming beneficiaries of these tools, as well as among the most prescient concerning the future of the written word.

As science has taken us into the realms of n-dimensions, relativity, quantum mechanics, black holes, fractals, superstrings, and myriad new technologies, we have been forced and inspired to create new shapes for our conceptions of space. New modes of writing displace the linear formats of the printed page. We see it everywhere, from the web to hypertext. Language's figurative plasticity continues to be stretched. Bruno's geometric rhetoric reveals a thinker with remarkable vision into language's implicit and explicit relationship to space and form, and an equally remarkable prescience as to the ways language could—and would—continue to evolve.

Notes

- 1 Georges Poulet, *The Metamorphoses of the Circle*, tr. Carley Dawson and Elliott Coleman (Baltimore: The Johns Hopkins Press, 1966), xxiv.
- 2 For studies on the question of "time" in Bruno, see Michele Ciliberto, *La ruota del tempo: Interpretazione di Giordano Bruno* (Rome: Editori Riuniti, 1992); Nicola Badaloni, "Sulla struttura del tempo in Bruno," *Bruniana & Campanelliana* III.1 (1997): 11-46; and Enrico Antonio Giannetto, "La relatività del moto e del tempo in Giordano Bruno." *Physis* 28 (2001): 305-336.
- 3 George Hersey, *Pythagorean Palaces: Magic and Architecture in the Italian Renaissance* (Ithaca: Cornell University Press, 1976); and Tyler Volk, *Metapatterns Across Space, Time, and Mind* (New York: Columbia University Press, 1995).