

5. Transformation and Individuation in Giordano Bruno's Monadology.

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Abstract:

*The essay explores the systematic relationship in the work of Giordano Bruno (1548-1600) between his monadology, his metaphysics as presented in works such as *De la causa, principio et uno*, the mythopoeic cosmology of *Lo spaccio de la bestia trionfante*, and practical works like *De vinculis in genere*. Bruno subverts the conceptual regime of the Aristotelian substantial forms and its accompanying cosmology with a metaphysics of individuality that privileges individual unity (singularity) over formal unity and particulars over substantial forms without sacrificing a metaphysical perspective on the cosmos. The particular is individuated as a unique site of desire, continually transforming but able to entrain itself and others through phantasmatic 'bonding', the new source of regularity in Bruno's polycentric universe. Bruno thus tries to do justice to the demands of intelligibility as well as transformative eros. The essay concludes with a note on Bruno's geometry as it relates to his general conception of form.*

Keywords:

Bruno, monadology, polycentricity, individuation, metaphysics, cosmology

Transformation and Individuation in Giordano Bruno's Monadology.

Bruno's cosmos is frequently described as *acentric*, but I would argue that we should rather conceive it as *polycentric*. Bruno himself describes the situation in more or less this way, stating in the fourth of his Paris disputation theses of 1588 that no point in the universe is peripheral to another without being for itself the center, with its own equal horizon (Bruno 1879, 1.1, 98). This doctrine has its roots, of course, in the pseudo-Hermetic axiom from the *Liber XXIV Philosophorum* that God is an infinite sphere, the centre of which is everywhere and the circumference nowhere. Bruno appropriates the axiom, however, in a form which is novel for the importance it accords to the perspectives of the individual centers, which have each their own *horizon*.¹ One might contrast Nicholas of Cusa's version of the same axiom: "The structure of the world is such, as if she had her center everywhere and her circumference nowhere, as her circumference and her center is God, who is everywhere and nowhere," (*De docta ignorantia* II,12, trans. Jasper Hopkins). In the original axiom, God is none other than the polycentric sphere itself. In Cusa's version, God is everywhere and nowhere, and since God is the center and circumference of the world, the center of the world is everywhere and its circumference nowhere. It is as if the abstract divine attribute of being everywhere and nowhere requires the universe to adopt a polycentric structure in order to orient itself to the divine. The polycentric structure is thus subordinated, becoming an image of a paradigmatic divine attribute. In the context of the disputation thesis, Bruno also casts the axiom as providing the sole manner in which to conceive the universe so that it may accord with Parmenidean Being, for the homogeneity required of Being by Parmenides would exist only from a single perspective if the universe had a single center. The multiplicity of perspectives, then, must either be resolved into one, or they must each bear the totality.

That Bruno has opted for the latter course is evidenced by his doctrine of indivisible spiritual substances, his monadology. According to Bruno's 1591 essay *De triplici minimo*, the substance of things is the *minimum*, of which there are three principal varieties: the general metaphysical minimum or *monad*; the corporeal minimum or *atom*; and the geometrical minimum or *point*. We need only concern ourselves for now with the monad. The monad is at once the indivisible substance of the soul and the essence of number, which is an accident of the monad insofar as the monad determines the species (Bruno 1889, 1.3, p. 139.3-4; 140.22-3). A hierarchy is thus established in which the monad is primary, then species, then number, number being essentially the repetition of form. In Bruno's dialogue *De la causa, principio et uno* (1584), the doctrine of the monad, to whatever degree he had formulated it at the time, is implied by the critique of Aristotelian substantial forms in which he engages.

In this dialogue Bruno speaks of the forms of species as mere “external” forms or form “in the vulgar sense” which applies only to “the operations which appear in the subjects and proceed from them,” (Bruno 1998, p. 48). Since these forms are but accidents of matter, they are in no sense substantial for Bruno at all, and therefore there are, for Bruno, *no* “corruptible substances” (46). What *is* for Bruno a “substantial form” is none other than the monad, the indivisible spiritual substance of the individual which transmigrates from species to species, although he does not use the terminology of monads in *De la causa*. Because he does not speak of monads in *De la causa*, the identification of the spiritual or vital principle of the individual spoken of in this dialogue with the monad of *De triplici minimo* could, in principle, be questioned. But there are clear parallels in the way Bruno speaks of the two. The description of the “internal artificer” in *De la causa*, which constitutes the animal from the heart outward (38), is exactly like the account in *De triplici minimo*, where Bruno says that “[w]e are what we are only by virtue of the indivisible spiritual substance around which atoms are gathered and clustered as around a center. Through birth and development the creative spirit expands into the mass of which we consist by diffusing itself from the heart to which its intermingled threads return like arrows. In this fashion the spirit returns by the same road down which it came and exits through the same door through which it entered,” (Bruno 1889, 1.3, p. 143.5-12, trans. Atanasijevic 1972, p. 27f). The exit to which Bruno refers is, of course, death, when the monad severs its connection to the atomic construct of the body to continue its journey, which will lead it to constitute some other body in similar fashion. The descriptions of metempsychosis in the two texts are in every way parallel. The identity of the two doctrines, or the inferences we are entitled to draw from them regarding Bruno’s affirmation of individual immortality, have only been questioned at all, I believe, due to certain basic misapprehensions, which I shall take up below; first, however, it is necessary to lay out more of Bruno’s doctrine in positive fashion.

Since the monad is the active principle behind and within the material form, it is this which Bruno, in *De la causa*, wishes to regard as the form in the proper sense, treating the Peripatetic form, which is the form of the species, as form in a merely relative or accidental sense, “just as whoever says what I do or can do is not expressing my being and substance; that would be expressed by who says what I am, insofar as I am myself, considered absolutely,” (Bruno 1998, p. 60). Bruno is speaking of ultimate individuals when he remarks that Aristotle was quite aware that what would be regarded as the Peripatetic substantial form is a mere “logical construction” rather than “the principle of natural things,” explaining “I believe he [Aristotle] fully realized it but could do nothing about it. This is why he says that the ultimate differences are unknown and cannot be expressed.” The difficulty of expressing the difference of the monadic individuals from each other, when all of the things we would normally use to distinguish them appear as accidents, should not however lead us to assume that Bruno’s individuals are not really distinct. Understanding this inner core of individuality is an infinite problem for the intellect. As Bruno explains in *De la causa*, “when we aspire and strive towards the principle and substance of things, we progress toward indivisibility ... let us not be led

into believing we can understand of the substance and essence more than what we can understand concerning indivisibility” (95). Bruno, though otherwise most sympathetic toward them, criticizes the “intellectual weakness” of Pythagoreans and Platonists in this regard for having unified beings under species, then genera, and then the highest genera into one being, a being which is, however, but a “vain thing,” as Bruno calls it, for they are unable to render from this thing “a single principle of reality and of being for all that is, as they have recognized a common concept and name for all that which is expressible and intelligible,” (96). The hypostatized Being Itself differs from the monad as principle in that ‘the monad’ is really *each monad* continuously constituting itself and informing matter. But it is important to Bruno to maintain at the same time a metaphysical perspective which discerns the unity in principles. From this perspective, “Pythagoras’ method is better and purer than Plato’s, because unity is the cause and the reason for *individuality and the point*, and it is a principle which is more absolute and appropriate to universal being,” (94; my emphasis).

The manifold of monads is a paradox in that each monad is absolutely unique from the rest because in it lies a first-person perspective around which the universe is disposed, and yet any characteristic by which we might hope to distinguish it from the rest is accidental and susceptible to change. No such characteristic, even were it to endure for all time, could be the individuating quality of such an individual. This is what Bruno means when he refers to the multiplication of individuals within the species by accidents (e.g., at 96). The numerical multiplicity within any species is, by definition, a multiplicity which comes about through accidents, even if these accidents are not accidents from another perspective, but specific differences. Note, in this respect, that Bruno speaks in the *Sigillus sigillorum* of the “second contraction”, through which “matter, through number, is determined to this or that form,” in terms strongly reminiscent of the language of bonding: “inferior nature ... through some habit of agreement and obedience, is collected together and ... rendered participant, either by a natural or a conceptual impulse...” (Bruno 1890, 2.2, p. 214).

Individuality is thus irreconcilable with formal unity insofar as formal unity necessarily displaces individuality, making of it an accident when for Bruno individuality, and not the form of the species, is the true substance. We must not infer the unreality of individuality from the very fact which makes individuality fundamental and primary in Bruno’s metaphysics. The formal determination of individuality is, in this respect, unattainable. Thus Bruno says in *De la causa* that “[t]his absolute act, which is identical with absolute potency, cannot be comprehended by the intellect, except by way of negatives ... for when the intellect wants to understand, it must try to form an intelligible species, and to assimilate and to measure itself with that species,” (Bruno 1998, p. 68). Notice that it is *itself* that the intellect measures with the species. This shows that the topic of the inquiry into the absolute act which is identical with absolute potency, is in some manner the *self*. And since it is the self in its very first-person character, it only recedes furth from view insofar as it is measured by one intelligible species or another, for it repels them from itself in the very act of thinking them. By contrast, “the divine mind and the absolute unity, with no species, is that which

understands and that which is understood simultaneously,” (95). Our attempts to grasp this absolute unity conceptually can only express “what we can understand concerning indivisibility.” The sophistication with which we are capable of conceiving absolute indivisibility is the index of our capacity to frame the notion of the monad.

The relationship of this ‘form’, that is, the monad, to the Peripatetic form is characterized by Dicsono, a character in the dialogue: “Inasmuch as this form that you posit as principle is a substantial form, it makes up a perfect species, is to itself its own genus, and is not, like the Peripatetic form, part of a species,” (48). Each monadic individual is, as it were, a species unto itself. The monad has thus inherited the status Scholastics accorded to the angelic individual, except the monadic pseudo-species has its serial instantiations through the particular bodies that it fashions in its successive lives, bodies which may belong *ex hypothesi* to the most diverse natural species. In this process, an indestructible form and indestructible matter collaborate to produce a destructible composite. The form, Bruno explains, “possessing in itself the faculty of constituting the particulars of innumerable species ... restrict[s] itself in order to constitute an individual, and, on the other hand, the potency of indeterminate matter, which can receive any form whatsoever, finds itself limited to a single species,” (ibid.). The Peripatetic form, then, has been recast as the mediator between the unity of matter and the virtually infinite multiplicity of unique, unrepeatable form-bringing individuals.

What is it in Bruno’s new system that comes to occupy the space, so to speak, that was occupied in the old system by the Peripatetic form? I do not think that Bruno fully resolved this issue; but I would like to indicate where I think the systematic foundations can be found for a resolution of the issue on Bruno’s own terms and in accord with the most original aspects of his thought. Bruno’s monadology, in granting a metaphysical foundation to individuality, does not commit him to the simplistic assumption that *phenomenal* individuals possess a greater autonomy than they in fact do. The participation of individuals in specific forms is the clearest indication of the composite nature of phenomenal individuals. Bruno speaks in the essay *De magia* of “a multitude of spirits and souls” in us (Bruno 1998, p. 137); more systematically, he explains in *De vinculis* that “everything that can be bound is composite in some way” (ibid., p. 160) and composition is needed in the binding agent as well: “we are in no way forcefully captured by simple and absolute things,” (167). Moreover, shifting our focus from the personal to the collective operation of bonding, “it is easier to bind many rather than only one,” (168). Bonding thus obeys its own logic complementary to that of the monadology, a logic of multiplicities rather than of units, in which monads participate not by virtue of their uniqueness but by virtue of their inescapable entanglement with each other, an entanglement which is equiprimordial with their uniqueness, for it begins from the moment that the monad, having terminated its relationship with a previous atomic construct which can no longer support its activities, begins to bond atoms together into a new body expressing the present state of its desire. As Bruno says in *De minimo*, “It is a property of it [the minimum] to compose, increase, form, as well as being composed, formed and increased to the maximum,” (Bruno 1889, 1.3, p. 146). It is not the

soul alone which can be seen either as active or as passive, but anything insofar as it can be seen as a natural or rational product respectively, for nature is “numerable number” and “measurable magnitude”, reason a “numerating number” and “measuring magnitude” (ibid., p. 136).

The desiring monad, as a natural being, bears the impressions of a history of previous bonds and so is no longer in this respect ‘atomic’ at all. The forms of species, therefore, insofar as they are active principles in their own right, are active as phantasmata binding the desires of monads and determining the corporeal forms they construct. Hence the importance for Bruno of “heroic” individuals taking control, to the degree possible, of their own phantasmatic economy: as Luca Salza remarks, the ‘heroism’ of Bruno’s ‘hero’ “consists precisely in ‘utilizing’ these metamorphoses, instead of suffering them passively,” (Salza 2007, p. 50 n. 42, trans. mine). This process has its exemplar on the cosmic scale in the activities of Jupiter in *Lo spaccio*, which has the implication, of course, that the forms of species are not themselves static, but engaged in evolutionary processes. This is not to ignore the activity of the specific form as a kind of corporeal individual in its own right which has its perpetuity in the individuals of the species; Bruno would, in this regard, doubtless agree with the judgment of Lucretius (I. 196-7; 584-92)—but this is only a stability, a durability within the processes of metamorphosis. The revolution Jupiter carries out is no simple process, either, but involves an economy. First, he places in the sky objects of intellectual contemplation, and then he sends incarnated phantasms into the world. The phantasms removed from the heavens must go somewhere; hence Jupiter sends them into the world, making them ethical *problems*. As heavenly images, they were like lenses coloring the natural light in ways whose contingency was masked by the fantasy of the *primum mobile*. By returning them to the world, Jupiter re-establishes their *immanence*, just as Bruno shatters the immutable stasis of the medieval cosmos. Dissolving this stasis was the prerequisite for a transformative understanding of the cosmos.

Bruno has been characterized as ‘anti-humanist’ for depriving the human species of the privilege accorded it in the hierarchical cosmos on account of its rationality; and indeed, he states in the *Cabala* that it is possible “that many animals have more understanding and a much more enlightened intellect than man,” and are only inferior insofar as they lack the proper limbs: all the things “that signify human grandeur and excellence, and make man truly the victory over the other species ... All this ... refers primarily not so much to the style of mind, as to that of the hand, organ of the organs,” (Bruno 2002, p. 57f). There is, within Bruno’s system, however, a different, subtler sort of privilege to which humans are heir. That which is more complex is less limited in the sorts of bonds into which it may enter (Bruno 1998, p. 159). This introduces, in turn, an “indeterminateness,” as Bruno calls it, within the species. Humans are thus more indeterminate in their desires than horses and the species ‘human’ is itself less determinate. Self-love, on the other hand, tends to limit the types of bonds into which the subject can enter to those which are “natural to them.” Self-love involves the desire to maintain the form of the body one occupies at the moment, and thus excludes

bonds incompatible with that form. Self-love is not, however, uniform in its action; rather, Bruno explains that while a thing strives out of self-love to preserve itself as it presently is, it strives as well “to be completely developed in itself.” And since for Bruno “everything can be produced from everything,” (ibid., p. 44) this means that it is also in accord with the monad’s self-love to experience other forms of life. The complexity of the human form of life gives it an indefiniteness allowing the human form it to be a more stable expression of the inherently restless desire of the monadic individual.

As Bruno puts it in *De magia*, “nothing is so incomplete, defective or imperfect, or, according to common opinion, so completely insignificant that it could not become the source of great events. Indeed, on the contrary,” he stresses, “*a very large disintegration into such components must occur for an almost completely new world to be generated from them*” (Bruno 1998, p. 111, my emphasis). Here we see the connection between the philosophical project of metaphysics of individuality and the project of social renovation that Bruno imagined. The “disintegration” of the Ptolemaic and Aristotelian cosmos into its radical components, namely the multitude of individual desiring monads and the atomic sea of matter, is essential to free the space for an account of bonding in general, because it forces us to account for the immense multitude of different bonds which constitute the cosmos, as well as to analyze apparently integral individuals to discern their internal composition and the consequent degree of stability they exhibit.

I referred above to certain misapprehensions that have helped, along with Bruno’s own frequent obscurity, of course, to frustrate the proper appreciation of Bruno’s monadology. One such misapprehension is that because Bruno speaks of a universal intellect or world soul, he does not intend the living things whose constitution he describes in *De la causa* to be really distinct individuals who retain an identity—however problematic—from one embodiment to another. This interpretation has been argued particularly forcefully by Ramon Mendoza (2002). Mendoza seems to conceive the ‘universal intellect’ as a *thinker*, when the latter seems for Bruno to embody merely the *intelligible order* of the universe: viz., e.g., the identification of the universal intellect with a harmony, or a special form of light, in *De triplici minimo* (Bruno 1889, 1.3, p. 170f). Light is an important topic in Bruno: it is at once one of the four irreducible principles of reality, together with “water or the abyss or the Styx,” “dryness or atoms or earth,” and “spirit or air or soul,” (*De magia*, Bruno 1998, p. 118); and with darkness one of the twin principles of the “mathematical” world, (ibid., 109); but also an accident (113). Hilary Gatti has also remarked on an “evolving” tendency of Bruno’s thought, reflected in the late fragment *De rerum principiis* (1590), “to eliminate from his discourse ... any reference to the universal intellect,” (Gatti 2010, p. 103).

If we are to speak of a universal agency in Bruno, and in a manner consistent with the rest of his thought, surely this agency must belong rather to matter: “That principle is most perfect which wishes [*vult*] to become all things ... and this is universal matter ... There is nothing outside of matter

or without matter,” (Bruno 1998, p. 173). Even spiritual agencies are treated by Bruno as incorporeal matter, and there is nothing in Bruno corresponding to the distinction between sublunar and celestial matter.ⁱⁱ The “immanent rational principle in matter” that Mendoza (2002, p. 278) correctly notes differentiates Bruno’s atomism from the Epicurean doctrine is thus simply this *desire* immanent to matter and its laws,ⁱⁱⁱ which form the substance of Bruno’s inquiry into bonding. Bruno Pinchard, who recognizes the crucial significance of the work on bonding to the final state of Bruno’s system, contrasts Bruno on just this point with Malebranche, in whom we may discern the outlines of Mendoza’s interpretation of Bruno. For Malebranche, though like Bruno rejecting the hierarchical cosmos of the Middle Ages, replaces it with a monism in which “[w]e are in effect only united *immediately* to God, and it is from this union that bonds”—i.e., relations between monads—“result, which are invisible in their basis,” (Pinchard 2007, p. 98). Pinchard recognizes here “a dilemma rationalism will never escape,” namely of either “reducing the bond to the relation”, and thus to the unity of the entire system of relations, which becomes the sole genuine subject—“the systems of relation will be the systems of absolute reason,” (92)—or, and this is Bruno’s choice, “recognizing the powers of the bond” as “an occult power of which I am at once the instigator and the victim,” (100). The point here is not the “occultism” *per se*, but rather the mysterious depth accorded the individual subject by rendering the bond concrete as the subject’s active or passive power; it is this which Mendoza resists in Bruno’s doctrine of metempsychosis.

Accordingly, when Bruno states in the *Cabala* that the specific essence in the human “is identical with that of flies, marine oysters and plant, and any other thing that is animated or has a soul” (Bruno 2002, p. 56), a necessary corollary to the metempsychosis doctrine he plainly endorses elsewhere, e.g., in *Lo spaccio*, in which humans we see about us now “have been or are about to be pigs, horses, asses, eagles, or whatever else” (Bruno 2004, p. 78), Mendoza is forced to interpret this *categorical* unity of souls as a *numerical* unity, through the false inference that “if man’s soul is identical with that of those living beings, there must be only one soul in all of them, which can be no other than the unique and singular soul of the world,” (Mendoza 2002, p. 289). This is the very Aristotelian logic of individuation through form that Bruno resists, however, in placing the ultimate principle of individuation *beyond form* as such. The multiplicity of forms an individual assumes through metempsychosis thus function as a sort of eidetic variation to disclose, negatively, the ineffable unity irreducible to any of them, the unity that can be identified only with the *desire* that runs like a thread through all of them, a unique trajectory at the heart of every living thing, that which Bruno calls “the divinity, the hero, the demon,” and, most tellingly, “the particular god [*il dio particolare*]” (Bruno 2004, p. 77).

A similar issue arises by way of the reference, in *De triplici minimo*, to God as the Monad of Monads (Bruno 1879, 1.3, p. 146.30). Atanasijevic, in her study of *De triplici minimo*, criticizes Bruno for failing to specify the relation between the monads and the Monad of Monads (Atanasijevic 1972, p. 31). Ernesto Schettino, similarly, while recognizing that “the absolute physical minima”—i.e., of

corporeal or incorporeal matter—"are the authentic substance" (Schettino 2002, p. 315), worries about "[h]ow to reconcile ... the existence of these physical infinite minima, which would each become an absolute in itself, with the unity of the maximum?" (319). Unlike Mendoza, Schettino recognizes that forcing this reconciliation through "a super Unity (or 'suprasubstantial' substance) of *matter-soul of the world-nature-universe- and so on*," (ibid.) is unsatisfactory. Schettino suggests—correctly, I believe—that the "transits between minima and maximum" (321) are to be conceived as an "expansion or self-unfolding on the part of the atom ... filling infinity with an infinite motion (which would mean unlimited speed) tantamount to immobility" (320), but is uneasy with this solution. Schettino's substantive concerns lie, first, in the status of space in the account, which lies outside the synthesis; and, second, Bruno's respect for "the awareness of our finitude and gnoseological limitations with respect to God's infinity" (ibid.). A full consideration of the former must take into account Bruno's geometry, on which see below; however, we can say in advance that the indifference of Brunian space to forms (Bönker-Vallon 2007, p. 67-71), the essential corollary of its polycentricity, forecloses any simple identity between this infinite atom and any *empirical* consciousness as passive configuration of the self rather than as the product of the activity of the infinite will, for the empirical consciousness is always a species-consciousness. In a certain sense we may say that the physical and gnoseological problem find their common solution in the Nolan's monadology.

With respect to the problem as Atanasijevic poses it, Bruno does not specify a relation between the monads and the Monad of Monads because these are not entities which can be posited upon a single plane. From one perspective there is simply the Monad *per se*; from the other, there are simply the innumerable individual incorporeal and corporeal monads. Similarly, in *De vinculis* Bruno explains that the "universal force of bonding ... cannot be designated by one name," but only posited with respect to "agents" such as "God, demons, souls, animals, nature, chance, luck and, finally, fate" (Bruno 1998, p. 145). Here diverse agents may be known according to their manners of bonding, while Bruno resists fully hypostatizing this universal, and hence subordinating the discrete agents, preferring to give an account of the activities classified as 'bonding'. Note, as well, that these bonding agencies are not all monads; bonding does not presuppose a subject intending to bind. Bruno's theory of bonding does not presuppose an underlying unity of one-in-all—on the contrary, it is precisely removing this presupposition which frees the space for an account of "bonding in general"; but nor does it yield to an uncritical empiricism.

The passage I cited above from the essay on bonding is significant for showing that Bruno envisioned a comprehensive theory of things which at the same time allowed for a real plurality of agents and perspectives. As he says in the very first sentence of *De vinculis*: "Anyone who has the power to bind must to some degree have a universal theory of things in order to be able to bind humans" (ibid.). The most binding theory therefore would, by embracing the very multiplicity of desires and perspectives without deforming them, succeed in harnessing them, just as the

polycentric universe alone can make the universe itself a Parmenidean intelligible. At the same time, however, Bruno strongly resists any *reductionistic* methodology, “for it is a sign of an ambitious, presumptuous, envious and vain mind to wish to persuade others that there is only one way to investigate and to attain knowledge of nature” (*De la causa*, Bruno 1998, p. 62). Bruno’s monadology is thus an ambitious attempt to meet both these conditions: universal in scope, but non-reductionistic, and the resulting high degree of abstraction explains some of the difficulty commentators have had understanding, e.g., Bruno’s diagrams, the polyvalence of which has finally been recognized by Arielle Saiber (2005), a subject to which I would devote some words in conclusion.

Bruno’s general concept of form cannot be treated without specific reference to his account of geometrical form. Bruno regards geometrical form as in some sense the ground of all others, as we see for instance in *De la causa* where he remarks that the triangle as “the first finite and first limited thing,” is “the primary foundation of every limited and configured thing” (Bruno 1998, p. 97). With this in mind, we can look at Bruno’s geometry in a different light; specifically, as an adjunct to his monadology—and in this light, what seems to render Bruno’s geometry unfit to function as a geometry in the narrow sense, that is, as geometry in the sense familiar to us, is just what makes it useful on this broader stage.

Bruno’s geometry is, we may say, his account of the *nonindifference* of space. Commentators have remarked on the indifference of space for Bruno relative to Aristotelian qualitative space, which gave a fixed direction to elemental motion, an absolute ‘up’ and ‘down’ for all things; but space is not indifferent as an expression of monadic desire. Monads form bonds, and bonding determines space, or rather, spaces appropriate to the bonds themselves. In Bruno’s geometry, figures have no uniform measure, but rather each one must be measured according to its *gnomon*, the number of minima which are in the smallest figure of its type. Hence a circle’s minimum increase in size comes about through the addition of six minima, while a triangle requires three minima, a square four. No figure can grow through the addition of one single minimum (Atanasijevic 1972, p. 50ff). Hence, a figure is made up, not of isolated monads, but of a monadic collective. Such a collective, in its nondecomposability, forms a kind of monad in its own right.

The determination of figures according to diverse minima represents a complement to Bruno’s well-known appropriation of the Cusan proofs of the identity of different figures in the infinite. For the doctrine of minima means that it is impossible to equate one sort of figure with another, even when the parts of one figure are equal in number to the parts of another; the rejection of a common finite measure for figures has the additional consequence that there are no irrational quantities (Atanasijevic 1972, p. 81; 110f). Having rejected number, an accident of species, as a common measure for figures, different figures can only be equated in the infinite, that is, in the infinite sphere of which each monad is the center. To translate back into the terms of metaphysics

the diverse figures are equivalent just insofar as each can be seen as the contingent shape of the infinite will of some given monad.

Bruno extends this same reasoning on incommensurability in an attempt to solve Zeno's paradox about Achilles and the tortoise. The paradox arises, in Bruno's judgment, from the attempt to compare incommensurable minima: the minimum of time and of motion, the minimum of impulsive force and the minimum of movement produced. A homogeneous measure can only be imposed upon these diverse species artificially and for practical purposes (Atanasijevic 1972, pp. 32-37). Bruno's solution indicates that there are more species of minima than just the metaphysical monad, the geometrical point, and the corporeal atom. We may thus posit that there are in turn, within these classes of minima, stable and irreducible structures like the figures within geometry, such as distinct 'figures' of time or force.

Bruno applies this reasoning to the senses as well, each of which judges according to its own measure (ibid., p. 59f). Bruno's reflections on finite geometry demonstrate that the realm of the figure or form is incommensurable with the realm of monads, an incommensurability which is immediately manifest in the contrast between the integral monad and the senses by means of which it knows the world, for each sense has, as it were, its own minimum or measure. There can be, in other words, no solipsism of sensation, because the monad is not the measure of its own sensation: sensation is not private, but essentially collective. In general, the point, which corresponds in geometry to the monad in metaphysics, is only conceivable as a non-detachable, purely relative moment in the gnomon of some species. The 'unit' of form is therefore really a whole or set while the metaphysical unit, being indivisible, thus eludes determination by any universal characteristics.

Indeed, Bruno's concern with incommensurability is a motive for his geometrical inquiries, as Saiber notes, for "[u]nlike in algebra and trigonometry, in geometry the notion of incommensurability can be formulated without contradiction," (Saiber 2005, p. 47). One might say that this distinguishes Bruno's approach to geometry from his models in antiquity, but only if one fails to take account of the 'philosophical' arithmetic Plato envisions at *Philebus* 56de, in contrast to the mundane arithmetic of *indifferent* units. Incommensurability is important to Bruno because only by recognizing different minima as *generically*, and not only specifically, diverse is a genuine theory of bonding possible, for a true bond requires genuine multiplicity, and things bonded cannot be primordially one, at least not in the respect in which they bond.

The fundamental division in Bruno's monadology is thus between the partless that is itself a part of some whole, as the minima in a collective, and the partless that is not a part, monads as ends, *termini* (*De Minimo* IV, Cap. VII (Bruno 1889, 1.3, p. 284.11-13). This is not a division of entities, but of modes of bonding—thus a line may be regarded as either a minimum (of extension) or a terminus (between plane figures) (ibid. 284.20-25). The distinction between minima and termini is that

between, on the one hand, the immanent bond of parts in a whole (or system) to the “first part” or minimum measuring that system, and to each other through its mediation; and on the other hand, the terminus as transcendent moment of *application* of a measure. Thus Angelica Bönker-Vallon notes that Bruno transforms Cusa’s doctrine of the coincidence of contraries by placing this coincidence—e.g., of the straight line and the curve—in the *termini* of the contraries, and thus internal to geometry. Bruno thus operationalizes Cusa’s reflections: “If for the Cusan all of mathematics could be finite and the consideration of the infinite nothing more than a symbolic aid (*manuductio*) for the knowledge of God, by nature unknowable, Bruno interprets the coincidence of qualitatively diverse opposites as the unity of quantitative extremes,” (Bönker-Vallon 2007, p. 70, trans. mine). Figures are incommensurable except in the infinite, but the infinite is no longer transcendent, but immanent, practical.

Saiber notes that Bruno introduces an element of temporal, even narrative constitution into the geometrical figure. Speaking of the diagrams in *Articuli adversus mathematicos* and *De minimo*, Saiber remarks on the narratives through which Bruno constructs the figures: “He often makes his explanations of how to draw a figure into stories with actual characters, not mere letters or symbols. His diagrams are the *results* of these stories; they are the products of a series of events; they are actual narratives and dynamic happenings,” (Saiber 2005, p. 49). The narrative construction of the diagram helps to highlight that the geometrical figure as such is in fact for Bruno a complex bonding rendered in an abstract form; and this helps us to appreciate his geometrical finitism. The minima composing a figure do not look inward, so to speak, toward the more simple, but outward, to the complex encounters of which the figure is a sign. The finite line’s divisibility into a finite number of minima signifies that it is not itself straight, but *angled*, virtually bent at each point at which it might break off into a new trajectory; a straight line is thus two lines in precise opposition, the contingent resolution of this internal conflict. Such a perfect opposition resolves itself into the perfect circle, which is identical to the infinite, perfectly straight line (*Articuli adv. math.*, Memb. VI, Art. 61ff (Bruno 1889, 1.3, pp. 33-36)). “In most instances of *coincidentia oppositorum*,” however, as Saiber remarks, “there is *not* perfect coincidence or perfect repulsion, and the intersection of these two entities eventually settles into an acute or obtuse angle of agreement,” (Saiber 2005, p. 91). While much has been said about the notion of *coincidentia oppositorum* in Bruno, not enough, perhaps, has been said about the *failure* of coincidence and its productivity, that which sends the monad restlessly off into its next encounter, its next transformation.

The point of syntheses such as the “dolphins on forest treetops and wild boars under the rocks of the sea” (*De gli eroici furori*, Argomento, 13), therefore, is not to dissolve differences into a *coincidentia oppositorum* leading all things to an undifferentiated unity, but rather the productive vitality of the incongruous union, the *failure of coincidence*, the failure of identity, which in turn demands transformation, as in Bruno’s emblem from the *Furori* of a phoenix burning in the sun, which bears the motto *neque simile, nec par*, “neither similar, nor equal,” on which Saiber comments

that “the hero in his process of transformation, or even transmutation ... is neither similar nor equal to that with which he is uniting,” and hence between them, contrary to the thesis of “mystical union”, “[t]here is intersection and acquaintance, but no fusion ... Two lines meeting on a plane do *not* become one and the same line, but an angle, a joining of discrete vectors,” (Saiber 2005, p. 92f). Similarly, the emblem of a boy’s face burning in flames and a phoenix flying overhead bears the motto *Fata obstant*, “Their fates run contrary,” and a poem that reads in part “I by Cupid, you by Phoebus are enflamed”; in this way Saiber explains that “Bruno shows how two opposing entities coincide in the general concept of ‘fire’, but are, ultimately, on different courses,” (ibid., 98f).

What is from a certain perspective the failure of mathematics is thus for Bruno an advantage. He does not *want* mathematics to enter into a privileged relationship of approximation toward empirical objects. He prefers analogical relationships, such as those between geometry and grammar (Saiber 2005, p. 53 and n. 115), the source of the geometrical-rhetorical syntheses Saiber uncovers in Bruno’s works, because of their lack of closure. Hence when Bruno severs the bond of necessity between a word’s form and its meaning (*De Compositione Imaginum*, I, Cap. X (Bruno 1889, 2.3, pp. 113-115), it is because he would promote an *infinity* of languages, not because he wishes to subordinate language’s material diversity to an inner identity. Indeed, the privilege Bruno accords in *De Magia* to hieroglyphic scripts over alphabetic ones is not because in their ‘natural’ resemblance to things they represent a unity above and beyond the conventional signs of alphabetic scripts, but rather because they are more plastic to investment by the individual, so that “each person, by the dictate of his own inspiration or by the impulse of his own spirit ... characterizes for himself each symbol according to his own impulse, and as the divine spirit personally exerts certain powers which are not expressed in any explicit language, speech or writing,” (Bruno 1998, p. 214). By not being fixed to a phonetic vehicle in the way an alphabetic script is, the hieroglyphic script is better suited to express that itinerant linguistic agency which forms ‘bodies’ for itself just as the indivisible soul-unit forms for itself one animal body after another.

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Notes:

ⁱ Note that Leo Catana, in his otherwise perspicuous study *The Concept of Contraction in Giordano Bruno's Philosophy*, does not note the significance of this passage for Bruno's doctrine of the "contraction of the horizon into the center" from his *Sigillus sigillorum* (Bruno 1890, 2.2, p. 182f) despite the consequences that a polycentric reading would have for the very meaning of an 'ascent' from multiplicity to unity (Catana 2005, pp. 10-13).

ⁱⁱ On "incorporeal matter", see the fourth dialogue of *De la causa*.

ⁱⁱⁱ Cf. Schettino, who speaks more judiciously of "an intrinsic and absolute rational structure that allows for the transits between minima and maximum, a rationality that must be determined *beginning from the minima*, because ... they are its foundation," (Schettino 2002, p. 321; my emphasis).

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