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“Squaring the Circle”: Cusan Metaphysics and the Pansophic Vision of Jan Amos Comenius

1. Introduction

In a seminal article of 1954, Jan Patočka put forward the provocative claim that the thought of Jan Amos Comenius (1592-1670), the famous seventeenth-century Czech pedagogue and polymath, could only be properly understood in light of the philosophical breakthroughs of the fifteenth century. While Patočka undoubtedly had in mind the entire philosophical and theological context of that century – not least the Realist/Nominalist controversy and the ecclesiastical developments which led to the foundation of Comenius’s own Hussite Church – he focused especially on the profound influence of Nicholas of Cusa upon Comenius’s developing thought. According to Patočka, what Cusa offered Comenius was an escape from the rigid worldview of scholastic Aristotelianism, towards a more dynamic and mystical, Christocentric view of reality. Indeed, he speculated that Cusa’s thought could even be the seed from which all of his philosophy subsequently unfolded¹ – a conviction echoed by Pavel Floss, who identified Cusa, with Aristotle and Augustine, as the chief formative influence on Comenius.²

Such an intuition is supported by the fact that we know Comenius discovered Cusa early in his career, sometime before 1621.³ His primary, and perhaps only, source for Cusa was the 1510 *Speculum intellectuale felicitatis humanae* of Ulrich Pinder (d. 1519), a Nuremberg physician and humanist who was an associate of the artist Albrecht Dürer (1471-1528).⁴ This consists of a compilation of substantial portions of many of Cusa’s major works: *De docta ignorantia*, *De conjecturis*, *De filiatione Dei*, *De dato Patris Luminum*, *De beryllo*, *Idiota de mente*, *De venatione sapientiae*, *De mathematica perfectione*, *De ludo globi* and *Trialogus de possesset*.⁵ Through it Comenius could have become familiar with all of Cusa’s principal metaphysical concepts.

The question of Cusa’s influence on Comenius, and especially on his famous encyclopedic project of *pansophia*, has recently been raised again by Simon Kuchlbauer. He argues that it was Comenius’s ongoing polemic with Anti-Trinitarians which led him to a new appreciation of Cusa’s Neo-Platonism, thus stimulating the development of his Trinitarian method of *pansophia*.⁶ Certainly, there is considerable biographical evidence in favor of such a hypothesis. Comenius’s major encounter with Anti-Trinitarians occurred in the 1630s during his Polish exile in Leszno. Here he came into frequent contact with Socinian intellectuals who sought to win him as a convert.⁷ It was also here that he wrote

¹ Jan Patočka, “Comenius und Cusanus,” in Jan Patočka, *Andere Wege in die Moderne: Studien zur europäischen Ideengeschichte von der Renaissance bis zur Romantik*, ed. Ludger Hagedorn (Würzburg: Königshausen & Neumann, 2006), 238-40.

² Pavel Floss, “Cusanus und Comenius,” *Mitteilungen und Forschungsbeiträge der Cusanus-Gesellschaft* 10 (1973): 190.

³ Jan Amos Comenius, *De Iterato Sociniano Irenico Iterata ad Christianos Admonitio* (Amsterdam, 1661), 117-18.

⁴ For more on Pinder see Catrien Santing, “Through the Looking Glass of Ulrich Pinder: The Impact of Humanism on the Career of a Nuremberg Town Physician around 1500,” in *Medieval and Renaissance Humanism: Rhetoric, Representation and Reform*, ed. Stephen Gersh and Bert Roest (Leiden: Brill, 2003), 203-20. For detailed discussion of the Cusan influence on Pinder see Ewald Lassnig, “Dürer’s ‘MELENCOLIA-I’ und die Erkenntnistheorie bei Ulrich Pinder,” *Wiener Jahrbuch für Kunstgeschichte* 57 (2008): 51-95.

⁵ Stephan Meier-Oeser, *Die Präsenz des Vergessenen: Zur Rezeption der Philosophie des Nicolaus Cusanus vom 15. bis zum 18. Jahrhundert* (Münster: Aschendorff, 1989), 402. Jan Patočka, “*Centrum Securitatis* und Cusanus,” in Jan Patočka, *Andere Wege in die Moderne*, 254 notes the inclusion of *De ludo globi* which is not in Meier-Oeser’s list.

⁶ Simon Kuchlbauer, *Johann Amos Comenius’ antisozinianische Schriften: Entwurf eines integrativen Konzepts von Aufklärung* (Dresden: Thelem, 2011), 61-89, 197-221.

⁷ Jan Amos Comenius, *De Quaestione utrum Dominus Jesus Propria Virtute a Mortuis Resurrexit ad Melchiorum Schefferum* (Amsterdam: Johannes Janssonius, 1659), 45-71 contains Comenius’s own account of his encounters with Anti-Trinitarians in the form of a letter to von Wolzogen.

his first pansophic works, and it was notably Johannes Ludwig von Wolzogen, an Austrian Socinian nobleman, who not only encouraged him to write these but also challenged him directly on the place of the Trinity in *pansophia*.⁸

Comenius responded to these challenges, from von Wolzogen, Melchior Scheffer, the Szlichtyng dynasty and others, with a series of Anti-Socinian writings. However, these were not published until 1659-61, during his Dutch exile, when he became concerned about the growing threat of Anti-Trinitarianism. It was at this time too that he met the Danziger Anti-Trinitarian Daniel Zwicker (1612-78). Significantly, it is in his two responses to Zwicker's provocative work the 1658 *Irenicum Irenicorum*, the *De Irenico Irenicorum* of 1660 and the *De Iterato Sociniano Irenico* of 1661, that we find Comenius drawing explicitly on Cusa's coincidence of opposites in support of his own Trinitarian worldview. This, above all, confirms the connection between his Christian metaphysics and his coincidence of opposites.⁹

While we should not doubt the main lines of Kuchlbauer's argument, the relation of Comenius's Anti-Socinian writings to his pansophic project is one that deserves much more discussion. With this in mind, my chapter will focus on the way in which Comenius drew on Cusa's epistemology in his polemical battles against the Socinians. For on the one hand this enabled him to construct a notion of sense and reason as open upward, but also subordinate to, the higher realm of faith. While on the other hand it allowed him to integrate his Cusan Trinitarian metaphysics into a wider Protestant, biblical framework, demonstrating a profound harmony of reason, creation and Scripture. Moreover, as will become clear, a deeper understanding of this has the potential to throw new light on a central question of Comenius scholarship: the relation of his *pansophia* to the *mathesis universalis* of René Descartes (1596-1650) and Gottfried Wilhelm Leibniz (1646-1716).

2. Sense, Reason and Harmony

Central to Comenius's Anti-Socinian works, and running through them as a leitmotif, is the question of the relationship between reason and revelation. In common with other orthodox Christians, Comenius viewed the Socinians as rationalists seeking to found "the dogmas of faith on the testimonies of reason."¹⁰ For him, the Socinian claim to be more biblical than their opponents was mere window dressing; serving only to conceal the rationalistic nature of their theological endeavor. Yet, as he recognized, the question of how to respond to the Socinians was a complex one. For in choosing to meet them on their own ground, as he frequently did, there was always the risk of succumbing to the same rationalist tendencies.

Comenius's response to this dilemma was complex and multi-layered. As Kuchlbauer has recognized, it ultimately relied on posing a very different understanding of reason to that held by the Socinians – one grounded on Cusan and Neo-Platonic, rather than Aristotelian and Nominalist principles.¹¹ Yet in order to see this, and appreciate its full scope, we need to approach it from a different perspective. For it was not first of all a matter of a clash of one kind of reason against another, but rather of reason against testimony and faith against science.

⁸ Comenius, *De Quaestione*, 63. See also Daniel Murphy, *Comenius: A Critical Reassessment of his Life and Work* (Dublin: Irish Academic Press, 1995), 19.

⁹ For detailed discussion of the relation of Comenius and Zwicker see Peter Bietenholz, *Daniel Zwicker, 1612-1678: Peace, Tolerance and God the One and Only* (Florence: L. S. Olschki, 1997), 79-103.

¹⁰ Jan Amos Comenius, *De Christianorum Uno Deo, Patre, Filio et Spiritu Sancto* (Amsterdam: Johannes Janssonius, 1659), "Ad Lectorem," n. 13.

¹¹ Kuchlbauer, *Comenius' antisozinianische Schriften*, 131-5, 184.

In his works Comenius often made an important distinction between the epistemological categories of sense, reason and faith. Drawing on a Platonic analogy of vision he described sense and faith as forms of direct contact with the external world, distinguishing them according to their point of origin. Reason, by contrast, he likened to reflex vision, since the light of sense (or indeed divine testimony) reaches the mind only as reflected from the mirror of its own concepts. In its self-reflective capacity, Comenius held that reason imitated God, who sees the whole of reality as reflected in his essence.¹² He was therefore perfectly willing to affirm the superiority of reason over sense. Yet Comenius also held, citing Scripture itself in support, that not only the testimony of the Bible but also the testimony of the senses should be preferred to reason. For although he believed that both sense and reason were damaged by the Fall, and thus in need of the guidance of Scripture, he also recognized that the introspective, narcissistic character of fallen reason made it far more dangerous spiritually.¹³

The importance of the senses in Comenius's thought has been widely appreciated. Indeed, Comenius's entire linguistic program – and building on that his educational, pansophic and theological programs – may be said to be premised on the claim that the senses are the beginnings of all thought and language. A cornerstone of his epistemology is therefore the Aristotelian principle that there is nothing in the mind that was not first in the senses. Moreover, Comenius held that knowledge not only commences from the senses, but that its truth and certainty is also grounded upon them. This is because while things impress themselves directly on the senses, they do so only mediately on the understanding. This led him to the striking conclusion that science “increases in certainty in proportion as it depends on sensuous perception.”¹⁴

At first sight such an epistemology might seem completely antithetical to the claim of scholars such as Floss, Rohls, Kuchlbauer and others, that Comenius holds to a distinctively Platonic concept of reason.¹⁵ Indeed, Comenius himself was adamant that his pupils should not learn things “taken out of some Utopia or borrowed from Platonic Ideas.”¹⁶ However, in his early *Great Didactic* and elsewhere, such Aristotelian themes are woven through with distinctively Stoic and Platonic elements, culminating in an apparent assertion of innate knowledge. As Comenius says “it is not necessary therefore, that anything be brought to a mind from without, but only that that which he possesses rolled up within (*involute*) himself be unfolded and disclosed (*explicari*).”¹⁷

Comenius's description here of cognition as a dynamic of folding and unfolding clearly echoes Cusa's famous couplet of *complicatio* and *explicatio*.¹⁸ Indeed, on closer inspection the epistemological parallels between the two thinkers begin to abound. For both Cusa and Comenius hold the Protagorean doctrine that the human mind is the measure of all things, while at the same time espousing a theory of representative perception. Both hold that concepts are abstracted from perceptual and imaginative images, while at the same time being derived *a priori* from the mind itself. Both hold the Aristotelian doctrine that the mind is a *tabula rasa* from birth, while at the same time insisting that it enfolds within

¹² Jan Amos Comenius, *Panaugia, or, Universal Light*, trans. A. M. O. Dobbie (Shipston-on-Stour: Drinkwater, 1987), 8.1-10 (pp 38-41).

¹³ Jan Amos Comenius, *De Irenico Irenicorum* (Amsterdam: Henricus Betkuis, 1660), 25-8.

¹⁴ Jan Amos Comenius, *The Great Didactic*, trans. M. W. Keatinge (London: Adam and Charles Black, 1907), 15.8, 20.7-8 (pp 106, 185).

¹⁵ See especially Jan Rohls, “Comenius, Light Metaphysics and Educational Reform,” in *Platonism at the Origins of Modernity: Studies on Platonism and Early Modern Philosophy*, ed. Douglas Hedley and Sarah Hutton (Dordrecht: Springer, 2008), 63-74.

¹⁶ Comenius, *Great Didactic*, 20.16 (p 189).

¹⁷ Comenius, *Great Didactic*, 5.5 (p 42). For the Latin text see Jan Amos Comenius, *Opera Didactica Omnia* (Amsterdam: Christophorus Cunradus and Gabriel à Roy, 1657), 5.5.

¹⁸ For the cognitive aspects of this see Nicholas of Cusa, *Idiota de mente*, 2.58-4.75 (h V.92-115).

itself the exemplars of all things. Finally, both hold that truth is some kind of adequation of the mind to the thing, while at the same time teaching that it is a “living mirror” of reality.¹⁹

The similarities between Cusa and Comenius are clear, but they immediately raise two further questions. Firstly, how are we to understand this bewildering array of seemingly contradictory statements? Secondly, what is the relevance of this for the question of faith and reason? With respect to Cusa, Jasper Hopkins argues that the key to the first conundrum lies in the crucial distinction between potentiality and actuality. As he says:

For what Nicholas says and means is that the human mind enfolds *in its power* the exemplars of all things – in the sense that it has the power to liken itself to all finite things by way of making concepts of them. And mind unfolds from itself a unity of things in the sense that it *actually* assimilates itself to things by actually abstracting from *species sensibiles* concepts of these things.²⁰

Precisely, the same may be said for Comenius. Echoing Cusa’s famous analogy in *Idiota de mente* of the mind as a “kind of divine seed,” Comenius holds that the mind inwardly apprehends the macrocosm of the universe in the same way that a seed contains a plant, i.e. in potentiality.²¹ This helpfully clarifies what he means by innate knowledge. For Comenius all knowledge is certainly innate, yet it is only innate potentially and must be brought into actuality through the light of the senses, which themselves must participate in the higher light of reason and intellect – a proposition that Cusa would have happily affirmed.²² The same point is also made by him with respect to his controversial claim that the human mind ought to mirror the divine omniscience. For Comenius makes clear that the “unbounded” nature of the human mind – greater than the universe itself, since it in fact contains the universe – is a potential infinity, and as such is only a pale image of the actuality of the divine infinity. Here, once again, we are reminded of a prominent Cusan theme – the “contracted infinity” of the human mind.²³

Returning to the question of faith and reason it becomes apparent that Comenius’s Cusan reconfiguration of the senses – as a kind of incipient intellect grounding all right reasoning – is crucial. For the senses are the route into the discovery of the essence of things, leading to what he calls in Cusan terms the “infoldings” (*complicationes*) of things, and through these into the inbuilt harmony of the

¹⁹ Jan Amos Comenius, *Pansophiae Prodromus* (Leiden: Davidis Lopez de Haro, 1644), 40-1; *Great Didactic*, 5.4-5, 5.9-10, 15.8, 20.4 (pp 41-2, 44-5, 106, 184); Erwin Schadel, “Anmerkungen,” in Jan Amos Comenius, *Die Pforte der Dinge: Ianua Rerum*, ed. Erwin Schadel (Hamburg: Meiner, 1989), 179; and John Sadler, *J. A. Comenius and the Concept of Universal Education* (London: Allen & Unwin, 1966), 252; cf. Nicholas of Cusa, *Compendium*, 10.34 (h XI/3.26-7); *Idiota de mente*, 2.58, 4.77, 5.87, 7.104 (h V.92, 116-9, 131, 156-7); *De beryllo*, 6 (h XI/1.8). This list is inspired by a similar passage in Jasper Hopkins, “Prolegomena to Nicholas of Cusa’s Conception of Faith and Reason,” 1-3 (http://jasper-hopkins.info/cusafaith_reason-engl.pdf. Accessed 24/03/2017). Hopkins notes that Cusa does not hold to a strict theory of adequation but rather one of correspondence. The same is true of Comenius who prefers to speak of the “conformity of thing with thing.”

²⁰ Hopkins, “Prolegomena,” 3.

²¹ Comenius, *Great Didactic*, 5.5, 6.1-5 (pp 42, 52-4); cf. Cusa, *Idiota de mente*, 5.81 (h V.122-3). Comenius’s seed imagery can also be sourced in Seneca and Juan Luis Vives.

²² Jan Amos Comenius, *Totius Pansophiae Seminarium*, 71-8, in *Dílo Jana Amose Komenského: Johannis Amos Comenii Opera omnia* [hereafter *DJAK*], ed. Jiří Beneš et al. (Prague: Academia, 1969-), 14.38-41; *Great Didactic*, 6.1 (p 52). There is a strong parallel with Nicholas of Cusa, *De quaerendo Deum*, 1.31-2.37 (h IV.22-7), but this text may not have been known to Comenius.

²³ Comenius, *Great Didactic*, 6.2 (p 52). Jasper Hopkins, “Orienting Study,” in Nicholas of Cusa, *Nicholas of Cusa: Metaphysical Speculations. Vol. 2*, ed. Jasper Hopkins (Minneapolis, MN: Arthur J. Banning Press, 2000), 17 says that for Cusa “human knowing partakes of Divine Omniscience, and human power of Divine Omnipotence; but they partake of them only finitely and contractedly.”

universe itself.²⁴ Indeed, since “all things have been harmoniously arranged by God in such a manner that the higher in the scale of existence can be represented by the lower, the absent by the present, and the invisible by the visible” it follows that the senses themselves have a profound spiritual quality.²⁵ Significantly, Comenius cites in support of this no less than Robert Fludd (1574-1637), who has been called “the most important English representative of the school of Nicholas of Cusa,”²⁶ providing yet another connection with Cusa’s own epistemology of sense.

Sketched out in the *Great Didactic*, this picture emerges in its full glory in his later pansophic works:

If we will follow these ways of things, and observe the indelible characters impressed in things, we shall discover a wonderful harmony of things [made] to a certain similitude of the divine being. For we shall discern that all things which are found in the lowest being are in the highest; but in the lowest degree, such as is accustomed to be in the rudiments of things in an enfolded fashion (*involute*), so that the more special, and always more perfect deduction of creatures, is nothing except the greater and more perfect unfolding outwardly (*explicatio ad extra*) of the things which are within. This our metaphysics will make clear.²⁷

In this rich passage the dynamic of *complicatio* and *explicatio* is made clear. Not only are the lower levels enfolded in the upper levels, and the special within the general, but all the levels are enfolded within God himself. In this sense, creation itself is simply an unfolding in time and space of the eternal patterns enfolded within the divine mind.

While it is only hinted at above, Comenius’s understanding of this universal harmony was also profoundly Trinitarian in character.²⁸ For he was adamant that it was the *Triune* being of God – and not some abstract, unitarian notion of being – which unfolds, and indeed proliferates, through every level of reality. Drawing on the Lullist tradition of divine correlatives, prominent in Cusa, Raymond of Sabunde (c. 1385-1436), and especially in the Renaissance philosopher Tommaso Campanella (1568-1639), Comenius held that the dynamic of the Trinity manifested itself at every level of reality through the divine triad of Power, Wisdom and Love.²⁹ Floss has already pointed out how Comenius’s treatment of the basic physical divisions of the universe – the triads of matter, light and spirit and of matter, form and privation – drew on the Cusan theme of *explicatio* and *descensus*, and it should be added that in his *De Christianorum Uno Deo* these are clearly interpreted as Trinitarian *explicationes*.³⁰ Exactly the same may be said of his basic metaphysical triad of unity, truth and goodness, which, in Proclan fashion,

²⁴ Jan Amos Comenius, *Patterne of Universall Knowledge*, trans. Jeremy Collier (London: T. H. and Jo. Collins, 1651), 131. For Latin text see *Pansophiae Diatyposis Ichnographica et Orthographica Delineatione* (Amsterdam: Ludovicus Elzevierius, 1645), “*Delineatio*,” 51 (p 155).

²⁵ Comenius, *Great Didactic*, 20.11 (p 187).

²⁶ Wilhelm Schmidt-Biggemann, “Robert Fludd’s Kabbalistic Cosmos,” in *Platonism at the Origins of Modernity*, 76.

²⁷ Comenius, *Pansophiae Diatyposis*, “*Delineatio*,” 53 (pp 157-8): “*Has rerum vias si sequuti fuerimus, et impressos rebus indelibiles observaverimus characteres reperimus miram rerum harmoniam; ad similitudinem entis primi. Deprehendemus enim omnia reperiri in ente infimo, quae in summo: sed gradu infimo, qualis esse in rerum rudimentis solet, involute: ut specialior, semperque perfectior creaturarum diductio, nihil sit nisi major et perfectior eorum quae sunt intus, ad extra explicatio: quod metaphysica nostra palam faciet*” (author’s own translation).

²⁸ For more on this see the article by Petr Pavlas in this volume. Pavlas prefers the term triadic.

²⁹ Comenius, *De Christianorum Uno Deo*, 25.1-30 (pp 30-41). For an overview of this Lullist tradition, including its relation to Comenius, see Simon J. G. Burton, *The Hallowing of Logic: The Trinitarian Method of Richard Baxter’s Methodus Theologiae* (Leiden: Brill, 2012), 55-63. For Campanella’s influence on Comenius see Matteo Raffaelli, *Macht, Weisheit, Liebe: Campanella und Comenius als Vordenker einer friedvoll globalisierten Weltgemeinschaft* (Frankfurt am Main: Lang, 2009).

³⁰ Floss, “Cusanus und Comenius,” 174-8; cf. Cusa, *De beryllo*, 39-44 (h XI/1.44-51).

explodes into a whole series of further triads encompassing the ninefold order of place, time, quantity, quality, action, passion, order, use and amiability.³¹ Citing in support Pinder's *Speculum intellectuale*, with its Cusan reference to the Trinitarian dynamic of unity, equality and union, Comenius thus held that "every creature is a certain wonderful image of the Trinity of the Creator."³²

For Comenius the multiple reflections and refractions of this triad throughout the created order can therefore be understood as traces – or *vestigia* – of the Trinity, leading to the whole universe being treated as

...a continual mirror of the infinite power, wisdom and goodness of God, ... that by its contemplation man might be compelled to marvel at the Creator, moved to recognize him and enticed to love him, when the might, the beauty, and the sweetness that lie invisible in the abyss of eternity shone out on all sides through these visible manifestations, and suffered themselves to be handled, seen and tasted.

Indeed, it was just this thought that inspired his famous analogy – echoing Cusa himself³³ – of the world as an earthly school preparing Christians for enrolment in the everlasting university, the heavenly school of Christ.³⁴

3. The Coincidence of Opposites and the Logic of Faith

In refusing to treat the world as a school in this way, instead remaining trapped and tangled in the cobwebs of their own reasoning, the Socinians entirely miss this dynamic, Trinitarian structure of reality. This, Comenius holds, not only impoverishes their minds but also imperils their souls. For, as he demonstrates through a detailed examination of the *Racovian Catechism*, the vital Christian concepts of participation and mediation can make no sense in the Socinian universe, leaving no real place for the doctrines of propitiation, grace, the sacraments, the indwelling of the Holy Spirit or union with Christ. Stripped of its heart of mystery, the sacramental and participatory structure of the Christian faith collapses utterly. The Socinians are thus left only with "the rivulet without the font, the ray without the Sun, the part without the whole."³⁵

For Comenius, the inability of Socinian reason to treat participation came to a head in their discussion of the mysteries of the Trinity and Incarnation. For it is here that the conflict between their flat, univocalising, Aristotelian logic, and the richer Christian, participatory logic of Neo-Platonism becomes fully explicit. In fact, nowhere is this clearer than in his dispute against Zwicker. In his *Irenicum Irenicorum* Zwicker had put forward what he viewed as an irrefutable argument against Christ's divinity. Drawing on the Aristotelian principle of non-contradiction he argued that two disparates cannot belong in one subject at the same time. According to him, in violating this, the orthodox doctrine of the two natures of Christ, and thus also of the Trinity itself, could only be viewed as a logical contradiction of the worst order.³⁶

³¹ Comenius, *De Christianorum Uno Deo*, 25.8-23 (pp 32-9).

³² Jan Amos Comenius, *Pansophia*, in *De Rerum Humanarum Emendatione Catholica Consultatio: Editio Princeps*, ed. Otokar Chlup et al., 2 vols. (Prague: Academia, 1966), I.398; cf. Ulrich Pinder, *Speculum intellectuale felicitatis humanae* (Nürnberg, 1510), fol. 13 which cites Cusa, *De beryllo*, 32-4 (h XI/1.35-8). Patočka, "Comenius und Cusanus," 239 also suggests a connection between Comenius's application of the triad of transcendentals and Cusa.

³³ Nicholas of Cusa, *De filiatione Dei*, 2.58 (h IV.44).

³⁴ Comenius, *Great Didactic*, 3.3 (pp 33-4).

³⁵ Jan Amos Comenius, *Socinismi Speculum Uno Intuitu* (Amsterdam: Johannes Parker and Johannes Theophilus, 1661), 81-6.

³⁶ Daniel Zwicker, *Irenicum Irenicorum* (Amsterdam, 1658), 5-12.

In response Comenius accused Zwicker of seeking to erect an entire system of theology on the basis of a single Aristotelian logical axiom.³⁷ This, he held, not only demonstrated the worst form of rationalism but also the worst kind of logic. Meeting Zwicker's claim head on, Comenius pointed to the crucial distinction between a logic of finite and infinite quantities:

Contraries and contradictories are never able to be said concerning the same thing according to Aristotelian logic, which contains rules made only about finite beings, distinguished from themselves by specific forms. But the more divine logic, contemplating the affections of infinite being, and pronouncing according to them, joins even the most distant and diametrical opposites, because it sees all things to coincide there.³⁸

Illustrating this he drew implicitly in the *De Irenico Irenicorum* and explicitly in *De Iterato Sociniano* on a number of geometrical illustrations taken directly from Pinder's edition of Cusa's *De docta ignorantia* and *De possest*: specifically the coincidence at infinity of a circle and a line, of a circle's centre and circumference and of rest and motion (illustrated by a spinning top).³⁹ By these he intended to demonstrate that "all proportions and impropotions of finites to each other are thus absorbed by infinity, so that there first and last, maximum and minimum, highest and lowest, straight and curved, mobile and immobile coincide."⁴⁰

Comenius's "more divine logic" was clearly that of Cusa himself.⁴¹ Yet it must not escape our notice that it was also that of Scripture itself. Against Zwicker he was quick to point out that scriptural language concerning Christ utterly contradicted his tired Aristotelian rule concerning disparates.⁴² Elsewhere, he also provided a catalogue of scriptural paradoxes about God which resembles a similar discussion in Cusa's *De possest*.⁴³ In this sense Comenius's Cusan logic of "transnaturals and eternal" was simply an embodiment of the established scriptural pattern of simultaneously predicating contradictory attributes of God, reaching its culmination in the doctrine of the two natures of Christ and the Trinity. As he made plain, this clearly served to underline the inscrutability and transcendence of God. Echoing Isaiah, he therefore held that to try and apply logic to the infinite God was utterly futile, like trying to weigh the mountains with scales or to count the grains of sand on the seashore.⁴⁴

Yet, paradoxically, the coincidence of opposites also served to underscore the immanence of God in the created order. For God's infinite transcendence means that he and his creatures are not comprehended under any genus, whether proximately or remotely, but are instead related as "all things" and "something." Comenius therefore concluded – displaying more than a hint of Cusa's conception of God as the "not other" – that while every creature, including man, has determinate limits to its essence, making it "this" and not "that" – *illud* and not *aliud*, God is "*to pan*" – everything – that is, he is all things eminently, yet none of them formally.⁴⁵ As the *Pansophiae Diatyposis* expressed it, he is the

³⁷ Comenius, *De Irenico Irenicorum*, 38-9.

³⁸ Comenius, *De Irenico Irenicorum*, 72: "Contraria et contradictoria de eadem re nunquam dici posse, iuxta logicam Aristotelicam: quae regulas tantum de entibus finitis, formis specificis a se determinatis, factas continet. Divinior autem logica, entis infiniti affectiones contemplans, et secundum eas pronuntians, etiam distantissima, et diametraliter opposita, jungit, quia ibi omnia coincidere videt" (author's own translation).

³⁹ Comenius, *De Irenico Irenicorum*, 72-4; *De Iterato Sociniano*, 117-9; cf. Pinder, *Speculum intellectuale*, fol. 22,31; Nicholas of Cusa, *De docta ignorantia*, 1.13.35-6 (h 1.25-7); *De possest*, 18-24 (h XI/2.23-30). For extensive discussion of these examples see Kuchlbauer, *Comenius' antisozinianische Schriften*, 205-13.

⁴⁰ Comenius, *De Irenico Irenicorum*, 44-5.

⁴¹ Comenius, *De Irenico Irenicorum*, 72.

⁴² Comenius, *De Irenico Irenicorum*, 38-41.

⁴³ Comenius, *De Christianorum Uno Deo*, 13.1-3 (pp 11-13); cf. Cusa, *De possest*, 21 (h XI/2.26-7).

⁴⁴ Comenius, *De Irenico Irenicorum*, 72, 197.

⁴⁵ Comenius, *De Irenico Irenicorum*, 39; cf. Nicholas of Cusa, *De li non aliud*, 2.7, 15.74 (h XIII.6, 39). Cusa also links God as "Not Other" to his divine eminence.

“invisible root” of all visible creatures, yet transcending all.⁴⁶ Ultimately the Cusan coincidence of opposites therefore encoded a logic of faith responsive to the Trinitarian and participatory structure of reality, expressing God as the transcendent and immanent ground of all creation. In this way it clearly played a vital role in Comenius’s response to the Socinians, allowing him to develop a sophisticated, two-pronged biblical and philosophical counter to their narrow rationalism.

4. *Pansophia* and the Coincidence of Opposites

It has become clear that at the heart of Comenius’s controversy with the Anti-Trinitarians was the key question of the relation of sense, reason and faith. Significantly, it was this same concern which motivated his lifelong pansophic quest. For *pansophia* itself was simply the conjunction of the three eyes of sense, reason and faith with the threefold external, internal and eternal light of God.⁴⁷ Bearing this in mind the claim that Comenius’s encounter with the Socinians stimulated the development of his pansophic method makes perfect sense. For it not only made him realize the apologetic potential of *pansophia* as a Trinitarian method, as becomes particularly apparent in his exchanges with von Wolzogen and Zwicker, but also challenged him to rethink his own understanding of reason. While his early pansophic work the *Totius Pansophiae Seminarium* of 1634-5 had proclaimed that “every cognition begins from sense, comes forth by faith and is perfected by reason,” his later pansophic works were always careful to subordinate reason to faith.⁴⁸ Indeed, it is notable that Zwicker himself should have detected a marked change in register in Comenius’s discussion of the relation of sense, reason and faith.⁴⁹

The key to this shift, as Kuchlbauer insightfully recognized, was Comenius’s appropriation of Cusa’s principle of the coincidence of opposites.⁵⁰ Yet if we are to follow Kuchlbauer in elevating the coincidence of opposites to the central breakthrough of the *pansophia* we are immediately confronted with a problem that he does not address: How is it that a principle emphasizing the utter disjunction between finite and infinite, and the associated cognitive dissonance between divine and human knowledge, could come to ground a quest for divine omniscience? In order to resolve this problem we need to go beyond the Anti-Socinian writings and later pansophic works back to Comenius’s earliest writings, tracing the emergence of the coincidence of opposites in his thought. For, as Patočka clearly recognized, such a genealogical endeavor is able to offer important insights into the development of his ideas. Indeed, of the two principal Cusan motifs which govern Comenius’s appropriation of this principle, it was Patočka himself who highlighted the significance of the infinite circle.⁵¹ By contrast, while the other motif – the squaring of the circle – has by no means gone unnoticed,⁵² its central importance for relating his projects of *pansophia* and *mathesis* has scarcely been appreciated.

In his spiritual classic *The Labyrinth of the World and the Paradise of the Heart* Comenius describes in allegorical terms the inward journey of the pilgrim (himself) from the darkness of the world to the light of Christ. At the beginning of his journey the pilgrim is forced to look through spectacles which had

⁴⁶ Comenius, *Patterne*, 103.

⁴⁷ See, for example, Comenius, *Panaugia*, 10.1-25 (pp 48-53).

⁴⁸ Comenius, *Totius Pansophiae Seminarium*, 73, in *DJAK* 14.41; *Panaugia*, 10.1-25 (pp 48-53).

⁴⁹ Comenius, *De Iterato Sociniano*, 74.

⁵⁰ Kuchlbauer, *Comenius’ antisozinianische Schriften*, 197-221. The importance of the coincidence of opposites in Comenius’s thought was earlier highlighted in Stephan Meier-Oeser, “J. A. Comenius und die Theorie der coincidentia oppositorum in der Philosophie der frühen Neuzeit,” in *Johannes Amos Comenius und die Genese des modernen Europa*, ed. Jan Lásek and Norbert Kotowski (Fürth: Flacius, 1992), 138-49.

⁵¹ Patočka, “*Centrum Securitatis* und Cusanus,” *passim*.

⁵² Detlef Thiel, “Zwischen phänomenologischem Sokratismus und ideengeschichtlicher Archäologie: Patočka und Cusanus,” in *Andere Wege in die Moderne: Forschungsbeiträge zu Patočkas Genealogie der Neuzeit*, ed. Ludger Hagerdorn (Würzburg: Königshausen & Neumann, 2006), 52.

the peculiar power “that to him who saw through them distant things appeared near, near things distant; small things large, and large things small; ugly things beautiful, and beautiful things ugly; the white black, and the black white, and so forth.”⁵³ As Patočka suggests, this inversion of vision most likely marks a parody of Cusa’s *De beryllo*, in which intellectual spectacles (the beryl of the title) are used to reveal the invisible realm of the coincidence of opposites.⁵⁴ The satire only deepens when the pilgrim enters the hall of the dialecticians and is given another set of glasses, identified as scholastic “second notions,” which supposedly allow him to penetrate everything to its core. For Cusa’s intellectual spectacles were of course intended to represent his new dialectic of the coincidence of opposites and its transcending of the Aristotelian logic grounded on the principle of non-contradiction.⁵⁵

Right at the end of his journey the pilgrim is given new glasses by Christ, whose lens are the Holy Spirit and rims are the Word of God, which finally allow him to see clearly. Like Cusa’s glasses these also reveal what cannot be seen with normal eyesight: in this case the invisible Church rather than the invisible realm of the intellect.⁵⁶ In the light of hindsight we may be justified in seeing in this an anticipation of Comenius’s later claim that the true coincidence of opposites is grounded in Scripture itself. Yet in the context of the *Labyrinth* itself such a claim is not at all obvious. For Comenius’s glasses appear much more similar to Calvin’s spectacles of Scripture than to Cusa’s intellectual beryl.⁵⁷ Indeed, Comenius’s skeptical attitude towards the coincidence of opposites is reinforced by his discussion of squaring the circle. For the promise to the pilgrim that he will be shown in this something “more wondrous than any subtlety in the whole world” remains completely unrealized. Instead, having witnessed the famous dispute between the Reformed scholar Joseph Scaliger and the Jesuit mathematician Christoph Clavius over the possibility of achieving this feat, he is only left more bewildered than before. The “eye-salve composed of physics and mathematics” has failed to heal his sight and he remains utterly unable to grasp the coincidence of circle and square.⁵⁸

Implicit in Comenius’s *Labyrinth* is a movement from the circumference of the world – which falsely appears as having its own autonomous center – to Christ the true center of all things.⁵⁹ Notably, this is a theme which was taken up and developed by him just a few years later in the *Centrum Securitatis*, which was written in 1625. In this he traces the motion of all things, including his own mind, back to God the true and eternal center of all things. Retreating from the dizzying gyration of all things visible and temporal, every man must move from the circumference of things to God the eternal “center of security” from which everything has its origin and dependence. Only in this way will he find himself in Christ the “center of God’s mercy.”⁶⁰ For Comenius, recalling a well-known Neo-Platonic and Hermetic trope, God is to be understood as “a circle whose center is everywhere and circumference truly nowhere.”⁶¹

⁵³ Jan Amos Comenius, *The Labyrinth of the World and the Paradise of the Heart*, trans. Franz von Lützwow (New York: E. P. Dutton & Co., 1901), 4.4 (p 71).

⁵⁴ Patočka, “*Centrum Securitatis* und Cusanus,” 255-6; cf. Cusa, *De Beryllo*, 8 (h XI/1.10-12).

⁵⁵ Comenius, *Labyrinth*, 11.5 (pp 133-4); cf. Patočka, “*Centrum Securitatis* und Cusanus,” 255; Cusa, *De Beryllo*, 40-1 (h XI/1.46-7).

⁵⁶ Comenius, *Labyrinth*, 41.1 (pp 295-6).

⁵⁷ John Calvin, *Institutes of the Christian Religion*, trans. Henry Beveridge (Grand Rapids, MI: Eerdmans, 1989), 1.6.1.

⁵⁸ Comenius, *Labyrinth*, 11.5, 10 (pp 134, 138-9). In this light Comenius’s own later attempt to prove this is a little puzzling (*Geometria*, 5, in *DJAK* 12.23-4).

⁵⁹ Comenius, *Labyrinth*, 5.5, 50.4 (pp 71, 336).

⁶⁰ Jan Amos Comenius, *Centrum Securitatis*, “*Praefatio*,” in *DJAK* 3.478-80.

⁶¹ Comenius, *Centrum Securitatis*, “*Praefatio*,” in *DJAK* 3.478.

As Patočka suggests this image of the ubiquitous circle clearly invokes Cusa's coincidence of opposites. The God who is both "highest and lowest"⁶² – recalling Cusa's famous coincidence of maximal and minimal⁶³ – is also the center of the "spinning wheel" of the universe in which infinite motion and rest must be understood to coincide. Patočka himself argues convincingly that this conception of the world as a wheel turning around God should be seen as an echo of *De ludo globi*.⁶⁴ This may be true but an even more obvious source is the illustration of the spinning top in *De possesset*, which Comenius later employed in his Anti-Socinian works.⁶⁵ Yet Patočka also highlights a certain ambivalence towards the coincidence of opposites to be found in the *Centrum Securitatis*. This is seen most clearly in Comenius's geocentrism, which implicitly, and perhaps unwittingly, rejects Cusa's own theocentric cosmology. However, it is also apparent in the ambiguity of his imagery which fails to match the depth and subtlety of Cusa's own. Arguably, therefore, the coincidence of opposites still remains in the realm of symbolism, its deeper significance either unclear or unwarranted.⁶⁶

Surprisingly, given its later importance, the coincidence of opposites also appears to be absent from Comenius's early pansophic works. Instead, following the clarion call of his own *Great Didactic* of 1633 these attempt to realize the Augustinian project of a scriptural philosophy – something, it must be said, which Cusa would have found remarkably narrow and constraining.⁶⁷ Thus in his popular *Pansophiae Prodromus* of 1639, Comenius attempts "to reduce contrariety to consonance" not through any paradoxical coincidence of opposites but rather through the more conventional effort to find a *via media* between two opposing truths.⁶⁸ Indeed, in linking this harmonization to the syllogistic principle that "things which agree in a third agree amongst themselves," and then implicitly grounding this principle in the divine ideas themselves, Comenius reveals himself to be in marked tension with Cusa's coincidence of opposites.⁶⁹ Thus while there are a number of significant Cusan echoes in this work – for example, God as the artist who fashions himself in his creation, God as the form of his creatures, existence as the shadow of the divine light and the notion of degrees of approach to the divine exemplar⁷⁰ – these arguably still remain detached from Cusa's central metaphysical insight. Rather, we seemingly remain in an Augustinian-scholastic realm in which the light of divine ideas becomes manifest in the clarity of the Aristotelian principle of non-contradiction.⁷¹

Signs of a change, in terms of the *pansophia* at least, come with the publication of the *Pansophiae Diatyposis* in 1643. Yet it must be admitted that, at first sight, this work appears even more foreign to Cusa than its predecessors. For here, continuing an important theme of the *Prodromus*,⁷² the Augustinian method of the divine ideas is combined with an attempt to realize demonstrative certainty.⁷³

⁶² Comenius, *Centrum Securitatis*, "Praefatio," in *DJAK* 3.478.

⁶³ Cusa, *De docta ignorantia*, 1.4.11-12 (h I.10-11); cf. Jan Amos Comenius, *Lexicon Reale Pansophicon*, in *Consultatio*, II.579.

⁶⁴ Patočka, "Centrum Securitatis und Cusanus," 246-54.

⁶⁵ Cusa, *De possesset*, 18-24 (h XI/2.23-30).

⁶⁶ Patočka, "Centrum Securitatis und Cusanus," 251-4.

⁶⁷ Comenius, *Great Didactic*, 25.18 (p 241).

⁶⁸ Comenius, *Pansophiae Prodromus*, 59, 68. It is true that the image Comenius uses here of bringing every truth to a harmonious center can later be used to affirm the coincidence of opposites (*Pansophia*, in *Consultatio*, I.481). Yet it must be remembered that even his later use of such images can sometimes be ambiguous. The most therefore that could be said is that the coincidence of opposites here appears implicitly as a seed of the *pansophia*.

⁶⁹ Comenius, *Pansophiae Prodromus*, 66-7.

⁷⁰ Comenius, *Pansophiae Prodromus*, 37, 65-6.

⁷¹ Comenius, *Pansophiae Prodromus*, 29. Comenius's resolution of these tensions in his Cusan dialectic of divine Idea and ideas is discussed below.

⁷² Comenius, *Pansophiae Prodromus*, 23-4, 43.

⁷³ Comenius, *Pansophiae Diatyposis*, "Delineatio," 63-4 (pp 168-70); cf. Johann Heinrich Alsted, *Encyclopaedia Septem Tomis Distincta* (Herborn, 1630), 1.4 (p 55).

Avoiding “prickly” second notions he thus seeks to ground all demonstrations in a Realist (Augustinian) bond between words, things, concepts and the archetypal divine ideas.⁷⁴ Notably, the true mathematical “eye-salve” of the *praecognita*, the self-evident axioms of thought, also becomes expounded within an Augustinian context of ascent and illumination. Once again therefore Augustine is presented as the inspiration underlying the Christian philosophy of *pansophia*.⁷⁵

Yet Comenius’s desire for *pansophia* to be a method of “universal harmony” now begins to realize itself in a positive appropriation of the coincidence of opposites. Certainly, he continues to make use of the language of *via media*, as he does throughout his life, but he now also holds that all contradictions must be decided by the method of “neither and both.”⁷⁶ As his later usage implies, this *can* refer to a real coincidence of opposites in which two contradictories are regarded as simultaneously true.⁷⁷ Reinforcing this connection is Comenius’s fascinating comparison of *pansophia* to the squaring of the circle. Here he remarks that just as the square is counted by geometers the measure of all figures, so the quadrangular method of *pansophia* – so-called as it offers a comprehensive account of all things through the medium of four different questions – is the “measure of all methods.”⁷⁸ For Comenius, the figure of the square symbolized an axiomatic approach to reality while the figure of a circle symbolized the plenitude of things (the encyclopedia).⁷⁹ In matching axioms to plenitude squaring the circle was therefore a fitting image for his universal method of *pansophia*. Yet at the same time in expressing the coincidence of straight and curved lines, squaring the circle can also be seen as a kind of shorthand for the coincidence of opposites itself.⁸⁰

In this we are inescapably reminded of Cusa, for whom the quest to square the circle represented the quest for the coincidence of opposites and ultimately for God himself.⁸¹ Indeed, extracts from Cusa’s *De mathematica perfectione*, one of his most significant works on squaring the circle, were to be found in Pinder’s anthology, and there is good evidence that Comenius had read them.⁸² He would most likely have also been familiar with Cusa’s treatment of this problem in *De docta ignorantia*. Here Cusa uses this mathematical problem in order to point to the coincidence of opposites, especially as it becomes resolved in Christ, the absolute and contracted maximum.⁸³ For Comenius too, Christ was the “bond of eternity and time” who “alone joins all opposites in himself.”⁸⁴ It was in this way that his own “pansophical, truly artificial, quadrature of a circle” sought to match his universal quadrangular method

⁷⁴ Comenius, *Pansophiae Diatyposis*, “Delineatio,” 14, 18-20 (pp 107, 112-14).

⁷⁵ Comenius, *Pansophiae Diatyposis*, “Delineatio,” 35-6 (pp 127-31); *Patterne*, 63-4.

⁷⁶ Comenius, *Pansophiae Diatyposis*, 14 (pp 13-14). It must be admitted that Comenius’s discussion here, as in *Prodromus*, is not always free from ambiguity.

⁷⁷ See Jan Amos Comenius, *Panorthosia or Universal Reform: Chapters 1-18 and 27*, trans. A. M. O. Dobbie (Sheffield: Sheffield Academic Press, 1995), 8.45-57 (pp 128-38). An even clearer example, leaving no room for ambiguity, is *Pansophia*, in *Consultatio*, I.481.

⁷⁸ Comenius, *Patterne*, 112-13; *Pansophiae Diatyposis*, “Delineatio,” 39 (p 134).

⁷⁹ Comenius, *Pansophia*, in *Consultatio*, I.528.

⁸⁰ This is particularly clear in Comenius, *De Irenico Irenicorum*, 44-5 but see also *Pansophia*, in *Consultatio*, I.661.

⁸¹ Karsten Harries, *Infinity and Perspective* (Cambridge, MA: MIT Press, 2001), 63. For an extensive discussion of squaring the circle in Cusa see Jean-Michel Counet, *Mathématiques et Dialectique chez Nicolas de Cuse* (Paris: Vrin, 2000), 257-94.

⁸² See Comenius, *Lexicon Reale Pansophicon*, in *Consultatio*, II.579. Here under “Maximum” he describes the coincidence of both maximum and minimum angles and the chord and arc of a circle. The first echoes Cusa’s *De beryllo*, 9-10 (h XI/1.11-13) and the second *De mathematica perfectione*, 3, 4, 16 in Nicholas of Cusa, *Opera omnia* (Strasbourg: Martinus Flach, 1488), II.490-8. Significantly, both these passages are found on the same pages in Pinder, *Speculum intellectuale*, fol. 13-14.

⁸³ Cusa, *De docta ignorantia*, 3.1.188, 3.4.206 (h I.121-2, 131-2). The second of these passages is found in Pinder, *Speculum intellectuale*, fol. 28.

⁸⁴ Comenius, *Lexicon Reale Pansophicon*, in *Consultatio*, II.482.

not only on the temporal circle of the disciplines but also onto the divine circle of eternity itself.⁸⁵ For to him this was to bring everything back to its true center in Christ.⁸⁶

This theme of squaring the circle is also taken up, implicitly at least, in his later *Consultatio Catholica*. For this reveals an important dialectic of divine Idea and divine ideas. Having himself from eternity as the “Idea of his works,” God expresses this in multiple ideas, which can be considered as a kind of mean between Creator and creation. Indeed, Comenius insists that these divine ideas, unlike the divine Idea are not eternal but created. He goes on to describe them as “a certain channel, through which the infinite begins to contract itself into the form of some finite, but in an immutable fashion,” citing a “certain philosopher” as saying that the “ideas of things are in God as triangles or other figures are made from a circle.” In eternity God is therefore to be considered as an infinite circle or line who produces a creature through contracting himself into finite lines and figures.⁸⁷

This philosopher is surely Cusa himself, who explicitly compares the relation of God and creatures both to the convertibility of an infinite and finite line and to the circle’s enfolding of all finite figures.⁸⁸ Moreover, both Comenius’s language of contraction and his innovative connection of the divine ideas to divine possibility can be sourced in Cusa himself.⁸⁹ Indeed, while Cusa could be critical of the application of the terminology of ‘idea’ to God,⁹⁰ it is notable that Comenius’s distinction between divine Idea and ideas resembles his own distinction in *De venatione sapientiae* between the uncreated, eternal possibility and created, perpetual “possibility of becoming” (*posse fieri*).⁹¹ Moreover, it is significant that Cusa, at least implicitly, also connected this possibility of becoming to both Platonic ideas and Aristotle’s principle of non-contradiction.⁹² In this way Comenius’s Cusan twofold conception of the divine ideas allowed him to maintain both the precision demanded of a logical method and the ultimate conjectural character of all knowledge. For while the secondary divine ideas (which also resemble Augustinian seminal reasons⁹³) allow access to the eternal and immutable laws governing all things, their relation to the primary divine Idea means that all creaturely participation remains an approximation, a contracted realisation, of the transcendent divine essence, always separated from it by the wall of the coincidence of opposites itself.⁹⁴

⁸⁵ Here we should perhaps recall the fifteenth-century tradition of Pseudo-Lullian alchemy, which may well have been known to Comenius through Alsted or Johann Valentin Andreae, in which the squaring of the circle symbolized a pantheistic fusing of God and the universe (Urszula Szulakowska, *The Alchemy of Light: Geometry and Optics in Late Renaissance Alchemical Illustration* (Leiden: Brill, 2000), 17-20).

⁸⁶ Comenius, *Patterne*, 8. Here he speaks of God rather than Christ specifically.

⁸⁷ Comenius, *Pansophia*, in *Consultatio*, 1.202.

⁸⁸ Nicholas of Cusa, *De ludo globi*, 1.40 (h IX.45-6); *De docta ignorantia*, 1.16.46 (h I.32). Another important source for Comenius’s doctrine of the divine ideas was Yves of Paris, *Ius Naturale Rebus Creatis a Deo Constitutum* (Paris: Dionysius Thierry, 1658) which he cites with approval in *Pansophia*, in *Consultatio*, 1.203. Yves was a Capuchin theologian deeply influenced by Neo-Platonism. However, while he was certainly familiar with Cusa’s thought his own preference was for Ficino (cf. Julien d’Angers, *Le père Yves de Paris et son temps (1590-1678). II L’Apologétique* (Paris: Société d’Histoire Ecclésiastique de la France, 1946), 83).

⁸⁹ Comenius, *Pansophia*, in *Consultatio*, 1.199-202; cf. Cusa, *De possesset*, 8 (h XI/2.8-9). Comenius would agree with Cusa that in God actuality and possibility coincide.

⁹⁰ Cusa, *De li non aliud*, 10.38 (h XIII.22).

⁹¹ Compare Comenius, *Pansophia*, in *Consultatio*, 1.200 with Nicholas of Cusa, *De venatione sapientiae*, 3.7-8 (h XII.9-11).

⁹² Cusa, *De venatione sapientiae*, 1.3; 13.38 (h XII.5-6, 37-8). See also *De li non aliud*, 10.38 (h XIII.22) where Cusa links the discussion of exemplars to Plato’s doctrine that the ideas are “prior to things but posterior to God.”

⁹³ Wilhelm Schmidt-Biggemann, *Philosophia Perennis: Historical Outlines of Western Spirituality in Ancient, Medieval and Early Modern Thought* (Dordrecht: Springer, 2004), 40 connects Cusa’s discourse on creation to the tradition of seminal reasons.

⁹⁴ Comenius, *Pansophia*, in *Consultatio*, 1.202-3; cf. Nicholas of Cusa, *De visione Dei*, 9.37 (h VI.34-5).

For Comenius, like Cusa, knowledge is ultimately asymptotic. It can always be more precise, in the same way that a polygon can always approach infinitely closer to the limit of a circle. For it is only the infinite, transcendent understanding of God that can grasp the coincidence of the eternal circle of his own essence with every finite and transitory figure.⁹⁵ In attempting to imitate this divine squaring of the circle the practitioner of *pansophia* attains an omniscience which is paradoxically also nulliscience, bringing it about that the more he sees the more he realizes his ignorance.⁹⁶ With the heart fixed on God, moved out of the circumference of things he always finds himself in God the center.⁹⁷ Following the pilgrim trail of Cusa's "learned ignorance," *pansophia* is thus, at its core, the contemplation of the all in the "all in all."⁹⁸

5. Metaphysics, Logic and the *Mathesis* of Thought

Realized by means of the coincidence of opposites Comenius's *pansophia* thus reveals its profound roots in Cusan metaphysics and spirituality. However, while the Cusan motif of squaring of the circle points to the infinite horizons of the pansophic method, in itself it does little to expose the contours of Comenius's parallel method of *mathesis*, which his works demonstrate he was working on intensively during this whole period. In order to address this issue we need to recapitulate our above account of Comenius's understanding of the divine ideas. For in doing so we will see the true convergence of his *mathesis* and *pansophia*. At the same time, a work such as Comenius's 1661 *Oculus Fidei*, his own revised edition of the celebrated *Theologia Naturalis* of the fifteenth-century Lullist theologian Raymond of Sabunde, demonstrates the deep connection between his *pansophia*, *mathesis* and Trinitarian apologetic. For here he speaks of the pressing need to develop a mathematical approach to theology. For him this need was rendered even more urgent by the rise of Anti-Trinitarianism, and it is significant that his edition of Sabunde was explicitly intended as a theological *panacea* for Zwicker's rationalism.⁹⁹

From his earliest works onwards, Comenius demonstrated his desire to attain a mathematical expression of the whole sphere of knowledge. In his 1630 *Geometria*, written for his students in Leszno, he spoke of *mathesis* as both offering the "highest certitude and evidence of all" and as seeming "to contain the principles of all other disciplines." Joining the scriptural and Augustinian understanding that "God has disposed all things in number, weight and measure" with the Platonic and Philonic understanding of geometry as the "chief and mother of all the disciplines," Comenius describes *mathesis* as a "philosopher's stone" of the mind.¹⁰⁰ Just a few years later, in his *Synopsis Physicae* of 1633, he extends this reasoning suggesting that we should strive for mathematical demonstrations not only in physics, but also in metaphysics and theology. Indeed, given that all human knowledge is grounded in God's "eternal law," Comenius's clear hope is that one day all disciplines, qualitative as well as quantitative, might be given mathematical expression.¹⁰¹ Moreover, unlike many of his contemporaries, he clearly

⁹⁵ Cf. Cusa, *De docta ignorantia*, 1.3.10 (h I.9).

⁹⁶ Comenius, *Patterne*, 64.

⁹⁷ Comenius, *Patterne*, 8.

⁹⁸ Comenius, *Patterne*, 106. Its aim is to contemplate "God in the creatures and the creatures in God."

⁹⁹ Jan Amos Comenius, *Oculus Fidei* (Amsterdam, 1661), "Epistola"; "Praefatio." For more on Comenius's relation to Sabunde see Kuchlbauer, *Comenius' antisozinianische Schriften*, 222-51 and Amedeo Molnár, "Comenius' *Theologia Naturalis*," *Communio Viatorum* 8:1 (1965): 53-64. Comenius doubtless saw this mathematical approach in Sabunde's combination of Anselmic "necessary reasons" and Lullist demonstrations.

¹⁰⁰ Comenius, *Geometria*, "Proemium," in *DJAK* 12.13; cf. Wisdom 11:20 and Augustine of Hippo, *De genesi ad litteram*, 4.3.7-4.9, in *PL* 34 col. 299-300.

¹⁰¹ Jan Amos Comenius, *Physicae ad Lumen Divinum Reformatae Synopsis* (Leipzig: Gotofredus Grossi, 1633), "Praefatio."

understands *mathesis universalis* as a universal science and not merely a universal system of mathematics.¹⁰²

In his *De Christianorum Uno Deo* Comenius further hints at the transcendental unification of the *trivium* and *quadrivium*. For here the Trinitarian unfolding of all reality from the transcendentals of being can be used to justify a common foundation for both logical and mathematical operations.¹⁰³ However, in seeking to explicitly relate both the mathematical and ideational structure of reality, and in expounding both within the purview of the coincidence of opposites, it is the *Pansophiae Diatyposis* which really breaks new ground. For here Comenius combines his Augustinian method of the divine ideas with the attempt to realize a universal *mathesis* in which every idea encodes mathematical certainty. Following his teacher Johann Heinrich Alsted (1588-1638), he argues that it is not only mathematics but also metaphysics that possesses the highest certainty. Indeed, Comenius even gives priority to metaphysics as containing the first principles of all the disciplines.¹⁰⁴

While this may sound like a retreat from universal *mathesis* towards a universal metaphysics, in fact, Comenius's later works demonstrate that it is precisely the opposite. This is perhaps most clearly seen from his *Ianua Rerum Reserata*, completed in 1670, in which he presents a comprehensive mathematical metaphysics. For Comenius, following an important second scholastic trend, the primary subject of metaphysics was not "being *qua* being" as it had been for Aristotle, but rather being in its intelligibility.¹⁰⁵ In the *Ianua Rerum* he defined metaphysics as the "science of ideas and possible worlds." Metaphysics therefore finds its proximate origin in the sphere of the human mind as containing within itself (potentially) the infinite possibilities of all things – an understanding already redolent of Cusa.¹⁰⁶ In recognizing the human mind as grounding the intelligibility of all things, Comenius significantly sought to characterize the intelligible structure of reality by means of mathematics. In the iteration of unity – 1, 11, 111 etc. – he sees the roots of metaphysical identity, whereas in the transposition of diverse numbers – 123, 132, 213 etc. – he recognizes the possibility of metaphysical diversity.¹⁰⁷ Comenius thus holds that what is thinkable (*cogitabile*) – i.e. that which correlates with every possible numerical combination in the realm of pure thought – precedes the realm of being itself.¹⁰⁸

Unsurprisingly, Comenius goes on to analyze being itself according to the transcendentals of unity, truth and goodness. Once again he therefore grounds number in transcendental unity. Yet now the number of pure thought comes before the actual unfolding of number in the real world of time and space. In this sense number both precedes being as the very condition of its possibility and succeeds it as its concrete instantiation.¹⁰⁹ In line with his Trinitarian understanding Comenius sees the ternary,

¹⁰² For discussion of this distinction and its great importance see Gerald Bechtel, "How to Apply the Modern Concepts of *Mathesis Universalis* and *Scientia Universalis* to Ancient Philosophy. Aristotle, Platonisms, Gilbert of Poitiers, and Descartes," in *Platonisms: Ancient, Modern and Postmodern*, ed. Kevin Corrigan and John Turner (Leiden: Brill, 2007), 129-54.

¹⁰³ Comenius, *De Christianorum Uno Deo*, 25.1-30 (pp 30-41). Here Comenius briefly discusses a trinitarian account of propositions and syllogisms closely reflecting Nicholas of Cusa, *De aequalitate*, 11-12 (h X/1.15-17).

¹⁰⁴ Comenius, *Pansophiae Diatyposis*, "Delineatio," 63-4 (pp 168-70); cf. Alsted, *Encyclopaedia*, 1.4 (p 55).

¹⁰⁵ For this second scholastic trend see Jan Aertsen, *Medieval Philosophy as Transcendental Thought: From Philip the Chancellor (ca. 1225) to Francisco Suárez* (Leiden: Brill, 2012), 635-56. On pp. 566-7 Aertsen points to some affinities between Cusa and second scholastic reflection on the super-transcendentals, but ultimately notes a marked difference.

¹⁰⁶ Jan Amos Comenius, *Ianua Rerum Reserata*, "Praefatio," c. 1-4, in *DJAK* 18.153-73; cf. Cusa, *Idiota de mente*, 9.125; 11.135 (h V.178, 188-9).

¹⁰⁷ Comenius, *Ianua Rerum*, c. 10, in *DJAK* 18.182.

¹⁰⁸ Comenius, *Ianua Rerum*, c. 11, in *DJAK* 18.183-5.

¹⁰⁹ Comenius, *Ianua Rerum*, c. 14 ff., in *DJAK* 18.191ff.

which he elsewhere calls the “eternal root of eternal harmony in our things and our concepts,”¹¹⁰ as the root of all numbers. For, as he says, echoing Cusa, even unity has a trinitarian dynamic. From the ternary, in which he says all contraries are resolved, he holds that all numbers may be understood to unfold in progression, but, like Cusa, he gives special place to the perfect numbers of seven and ten as well as to the number four.¹¹¹ Moreover, in seeking to break down numbers themselves into combinations of primary numbers, and ultimately into ternaries, we may clearly see how Comenius expresses the unfolding of differentiated multiplicity from the enfolded Trinitarian dynamics of unity – a profoundly Cusan move. We can also see, much more clearly, his rationale for what we might call the Augustinian sevenfold cascading of divine number into the numbers that define created reality – a major theme of his *pansophia*.¹¹²

In his *Triertium Catholicum*, which was significantly finished in the same year as the *Ianua Rerum*, Comenius seeks to extend his mathematical metaphysics into a mathematical logic. In doing so he sought what he called the “common bond” of all the arts, through attempting to unite *trivium* and *quadrivium* into one metaphysical and mathematical synthesis.¹¹³ Following his Ramist teachers at Herborn, Comenius viewed all of logic as summed up by invention, judgement and method – namely, the discovery of logical arguments, the formation of propositions and syllogisms and their subsequent methodological expression into whole systems of thought. Unlike the Ramists, however, who tended to detach these from each other, he understood these as three dynamically interrelated aspects of a single act of reasoning.¹¹⁴ Moreover, drawing on Alsted and Cusa he held that method had to have the “reason of a circle,” unfolding everything which is enfolded in the essence of things themselves. At the same time he was clear that this logical circle of invention, method and judgement itself reflected a trinitarian pattern, comparing it to the Augustinian and scriptural triad of number, measure and weight. For logic always entails a flow from invention into method and from both into judgement, mirroring implicitly the intra-Trinitarian dynamic.¹¹⁵

Invoking Augustine, Comenius therefore held that “thoughts are nothing but the numbering, measuring and weighing of things” and logic “nothing but the numbering, measuring and weighing of thoughts.” In these terms logic is simply “*mathesis* applied to thoughts,” while grammar can be considered as “*mathesis* applied to words” and pragmatics, the science which includes rhetoric, as “*mathesis* applied to actions.”¹¹⁶ The *Triertium* thus fulfills Comenius’s pansophic desire to reduce all arts, through the

¹¹⁰ Jan Amos Comenius, *Panaugia*, 10.24, in *DJAK* 19/1.234.

¹¹¹ Comenius, *Ianua Rerum*, c. 32, in *DJAK* 18.212-14; cf. Nicholas of Cusa, *De conjecturis*, 1.2.7-3.11 (h III.11-17). Both Cusa and Comenius give special priority to the numbers 1, 4, 7 and 10 in the unfolding of reality. This can be most clearly seen by comparing Comenius’s account of number with Cusa’s diagram of the unfolding of number in *De conjecturis*, 3.11 (h III.17), as well as with his *De ludo globi*, 2.107-9 (h IX.133-6). Significantly, passages from *De conjecturis* are to be found in Pinder, *Speculum intellectuale*, fol. 65-72 including numerical diagrams on fol. 66, 70, 71 and 72 and discussion of the septenary and denary on fol. 72. The parallel with *De ludo globi* is also very close and this stands out as a major potential source for Comenius’s reflections, whether direct or indirect, seemingly unnoticed by the editors of the critical edition.

¹¹² Comenius, *Pansophia*, in *Consultatio*, I.398 cites Pinder, *Speculum intellectuale*, fol. 13; 18 on number. The latter of these identifies itself as Augustine’s sevenfold account of number from *De vera religione* and book 6 of *De musica*. Comenius’s sevenfold patterns can be seen throughout the *Consultatio*, not least in the structure of the work itself.

¹¹³ Jan Amos Comenius, *Triertium Catholicum*, ed. George Klima and L. Zelenka Lerando (Prague: Sokol-Packard, 1922), 1.12 (pp. 18-19).

¹¹⁴ Comenius, *Triertium Catholicum*, 3.1-47 (pp. 27-38); cf. Bartholomäus Keckermann, *Praecognita Logica* (Hanover, 1604), 220-6.

¹¹⁵ Comenius, *Triertium Catholicum*, 3.1-22 (pp. 27-32); cf. Johann Heinrich Alsted, *Metaphysica, Tribus libris tractata* (Herborn: 1616), “*Praefatio*,” 4-8.

¹¹⁶ Comenius, *Triertium Catholicum*, 3.9 (p. 29): “*Unde apparet (NB) sicuti cogitationes humanae nihil sunt nisi numeratio, mensuratio, ponderatioque rerum: ita logicam nihil esse nisi numerationem, mensurationem,*

mediation of their metaphysical ground, to the certainty of mathematical and mechanical science. Cementing the intimate mathematical bond between logic and metaphysics is the fact that the places (*loci*) which logical invention draws on are nothing other than the ninefold, trinitarian unfolding of the three transcendentals of unity, truth and goodness. Significantly, in a bold bid to unite Aristotelian, Ramist and Lullist logic, Comenius refers to these nine categories as his “own predicaments.”¹¹⁷ Logic, as a *mathesis* of thought, is derivative of and flows out of metaphysics, as the *mathesis* of things.

In its mathematical character human thought, language and logic therefore mirrors conceptually both the dynamic mathematical structure of the universe and its eternal divine ground. In the *Consultatio* Comenius makes this relationship fully explicit, incorporating number into the Trinitarian dynamics of the divine mind itself.¹¹⁸ For here he argues that in unfolding all of reality from his Triune being according to “foreseen number, measure and weight,” God has impressed “created numbers, measures and weights” on man as his image, in order to allow humans to number, measure and weigh all things. These “inborn ideas and instincts engraved on our minds” then combine with our faculties to show us the numbers, weights and measures of intelligible things.¹¹⁹ Echoing Cusa’s *De conjecturis* Comenius therefore held that numbers were in their very nature a triune unfolding of the potentiality of both the divine and human mind. Like the divine ideas they could therefore be seen as constitutive of all things.¹²⁰

In this Comenius, even more than Cusa, sought to integrate Augustine’s early reflections on divine number with his mature reflections on divine ideas. In a recent, ground-breaking work, David Albertson traces Cusa’s attempt to develop a quadrivial method able to both transcend the rationalism of late medieval scholasticism and overcome the marked tension in the Christian tradition between Platonism and Pythagoreanism – a tension which Albertson significantly traces back to Augustine himself.¹²¹ In light of this, Comenius’s own fusing of an Augustinian logic of the divine ideas with a Cusan approach to *mathesis* marks an ambitious attempt to carry out a comprehensive, quadrivial reform of all the disciplines. For where Augustine ultimately elevated the divine ideas over numbers, being, Albertson suggests, either unable or unwilling to equate *Arithmos* with *Logos*,¹²² Comenius, following Cusa, had no doubt about their essential identity. For Comenius, as for Cusa, mathematics, in expressing the horizon of the finite and infinite, becomes at once both the paradigm of human certainty and the hallmark of divine conjecture and creativity. Guido Giglioni has described this power of the human mind to create and bring into being its own worlds as “one of the most original contributions” of Comenius’s metaphysics.¹²³ Now we may clearly see its Cusan origin.

ponderationemque cogitationum. Et per consequens (NB) logicam nihil esse, nisi mathesin, applicatam cogitationibus: grammaticam, nihil nisi mathesin applicatam sermonibus: pragmaticam, nihil nisi mathesin applicatam actionibus.”

¹¹⁷ Comenius, *Triertium Catholicum*, 8.7 (p. 53).

¹¹⁸ Comenius, *Pansophia*, in *Consultatio*, I.202.

¹¹⁹ Comenius, *Pansophia*, in *Consultatio*, I.202; *Panaugia*, 8.6, in *DJAK* 19/1.222: “*Menti vero insculptae rerum intelligibilium notiones et impressi instinctus cum adstructis facultatibus vellicantes nos intus perpetuo et nobis rerum mensuras, numeros, pondera ostendentes percipiuntur interiore quodam oculi.”*

¹²⁰ Comenius, *Pansophia*, in *Consultatio*, 1.186-9, 200, 202; *Ianua Rerum Reserata*, 32.78-9, in *DJAK* 18.212-14; *De Christianorum Uno Deo*, 25.13 (pp 33-4); cf. Cusa, *De conjecturis*, 1.2.7-9 (h III.11-14).

¹²¹ David Albertson, *Mathematical Theologies: Nicholas of Cusa and the Legacy of Thierry of Chartres* (Oxford: Oxford University Press, 2014), 61-90, 170-277.

¹²² Albertson, *Mathematical Theologies*, 69-81.

¹²³ Guido Giglioni, “The Darkness of Matter and the Light of Nature: Notions of Matter in Bacon and Comenius and their Theological Implications,” *Acta Comeniana* 17 (2003): 21.

6. *Pansophia* and *Mathesis Universalis*

Ultimately, then, Comenius's *pansophia* becomes founded on a correlation between divine and human *mathesis*. In this, Comenius appears far removed from the conventional canons of Enlightenment, and especially, Cartesian rationality. Comenius was in fact a contemporary of Descartes and the two had a celebrated meeting near Leiden in 1642 arranged by their mutual friend Samuel Hartlib (1600-62). While both were very polite and complimentary to each other it quickly became evident that they were talking past each other. For his part, as may be clearly seen from a recently discovered letter, Descartes had no sympathy with Comenius's *pansophia*, which he saw as an unacceptable mixing of philosophy and theology.¹²⁴ Indeed, compared to Comenius, Descartes's own *mathesis universalis* seems to have been generally more limited in scope – a universal mathematics as recent commentators have emphasized and not primarily a universal science.¹²⁵

For his part, Comenius regarded Descartes as having undoubtedly excelled at *mathesis*, yet he also noted that the challenge of squaring the circle remained beyond him.¹²⁶ There is a kind of irony in this. For in his youth Descartes seems to have read Cusa with some interest, and he famously cited him in support of his own thesis of an unbounded universe.¹²⁷ Moreover, like Cusa and Comenius, Descartes also used the analogy of circle and polygon to illustrate the relation between the infinite divine essence and creatures as its finite expression.¹²⁸ Yet while open to this kind of squaring the circle, and thereby, Karsten Harries argues, to the coincidence of opposites itself, Descartes's own philosophical expression of this turned out to be very different from that of either Cusa or Comenius.¹²⁹ For him God's transcending of the principle of non-contradiction becomes expressed in voluntaristic fashion in terms of God's creation of mathematical truths.¹³⁰ While both Comenius and Cusa held to the inviolability of the principle of non-contradiction in the rational realm, as expressing the very possibility of mathematical reasoning, Descartes's thought is shadowed by the disturbing possibility of its rupture, and thus of the rupture of reason itself. In this, as Harries insightfully recognizes, he effectively cut off the finite from the infinite, setting the mathematical world adrift from its transcendent ground.¹³¹ It is no wonder then that Comenius became increasingly concerned in his later works over the implications of Cartesian rationalism, even describing it in his *Clamores Eliae* as the "cancer of philosophy" and a threat to true Christianity comparable to that of Socinianism itself.¹³²

Unlike Descartes, Leibniz saw in the *pansophia* something of great value. Since the pioneering work of Leroy Loemker, his profound debt to the Herborn School of Alsted has been clear. Leibniz considered Alsted's *Encyclopaedia* as the scientific triumph of its age and it clearly shaped his own

¹²⁴ See Jeroen van de Ven and Erik-Jan Bos, "Se Nihil Daturum – Descartes' Unpublished Judgement of Comenius' *Pansophiae Prodomus* (1639)," *British Journal for the History of Philosophy* 12:3 (2004): 369-86.

¹²⁵ See Chikara Sasaki, *Descartes' Mathematical Thought* (Dordrecht: Kluwer Academic, 2003), 189-203. However, this distinction should not be pushed too far. As Sasaki points out *mathesis universalis* could serve Descartes as a template for universal method.

¹²⁶ Jan Amos Comenius, *Judicium de Responsione Serarii*, in *DJAK* 18.44.

¹²⁷ René Descartes, *Descartes' Philosophical Letters*, trans. Anthony Kenny (Oxford: Oxford University Press, 1970), 221. Descartes cited Cusa as holding an infinite universe in distinction to his own view that the universe was unbounded. In fact, as may be seen from Cusa, *De docta ignorantia*, 2.1.97 (h I.64-5), Descartes's view was much closer to Cusa than he himself realized.

¹²⁸ Daniel Flage and Clarence Bonnen, *Descartes and Method: A Search for a Method in Meditations* (Abingdon: Routledge, 1999), 82-3.

¹²⁹ Karsten Harries, "Problems of the Infinite: Cusanus and Descartes," *American Catholic Philosophical Quarterly* 64:1 (1990): 100.

¹³⁰ Sasaki, *Descartes' Mathematical Thought*, 366-73.

¹³¹ Harries, "Problems of the Infinite," 91-101.

¹³² Kuchlbauer, *Comenius' antisozinianische Schriften*, 79-84, 264-9.

encyclopedic endeavours.¹³³ Moreover, as Maria Rosa Antognazza has argued, he was also deeply influenced by the trinitarian metaphysics of Johann Heinrich Bisterfeld (1605-55), Alsted's pupil and son-in-law.¹³⁴ The extent of Comenius's philosophical influence on Leibniz is less clear, and little attention has been paid to it hitherto, but we know he greatly valued his pedagogical and irenic works. Moreover, in the sharpest possible contrast to Descartes, for whom the *pansophia* was ultimately of no account, he wrote of it prophetically as containing the very seeds of the future.¹³⁵ In fact, Leibniz's affinity to Comenius here is scarcely surprising for, as the work of Thomas Leinkauf and Antognazza has demonstrated, his own thought, and especially his famous understanding of universal harmony, belongs squarely within the Lullist-Cusan tradition.¹³⁶ In this light, both Comenius's own assertion that "every particular being is the image of the whole universe" and his appropriation of Campanellan Trinitarian metaphysics may be seen as clearly anticipating the *Monadology*.¹³⁷

While Leibniz could be critical of Comenius's own pansophic approach to universal science, we can also detect deep and surprising connections between their twin projects of *mathesis*. Leibniz's own early fascination with universal character and universal language is well known. For this, as Paolo Rossi suggests, he drew deeply on the works of Alsted and Bisterfeld as well as the British philosophers John Wilkins (1614-72) and George Dalgarno (c. 1626-87). However, Paolo Rossi also argues for two fundamental differences between Leibniz and his predecessors: his close connection of the universal language with the *ars inveniendi* and his merging of the universal language with combinatorial logic in order to provide a mathematical, or algebraic, system of thought, as a true "calculus of reason." However, while Rossi credits Comenius for inspiring Leibniz to recognize "one of the most important theses of his work," the co-identity of the universal language and encyclopedia, he does not discern any deeper connection.¹³⁸ Yet Comenius's attempt to develop a *mathesis* of thought and his own attempt in the *Triertium* to develop a Lullist combinatorial system of concepts as a fount of logical invention, in which, paralleling the universal harmony, "any concept contains every concept within itself," shows a remarkable affinity with Leibniz.¹³⁹

Yet for all these profound connections there was in fact a deep gulf separating Comenius's and Leibniz's understanding of reason. Like Comenius, Leibniz was also deeply concerned about the influence of Anti-Trinitarianism. Indeed, one of his early writings is even a piece directed against Zwicker himself. However, while Comenius, as we have seen, invoked Cusa's coincidence of opposites in his own polemic against Zwicker, Leibniz's reasoning concerning God remained entirely bounded by the logical principle of non-contradiction. Thus while he always defended the transcendent and mysterious

¹³³ Leroy Loemker, "Leibniz and the Herborn Encyclopedists," *Journal of the History of Ideas* 22:3 (1961): 323-38.

¹³⁴ Maria Rosa Antognazza, "Immeatio and Emperichoresis: The Theological Roots of Harmony in Bisterfeld and Leibniz," in *The Young Leibniz and his Philosophy (1646-76)*, ed. Stuart Brown (London: Kluwer Academic, 1999), 41-64.

¹³⁵ Loemker, "Leibniz," 332-3.

¹³⁶ Thomas Leinkauf, *Einheit, Natur, Geist: Beiträge zu metaphysischen Grundproblemen im Denken von Gottfried Wilhelm von Leibniz* (Berlin: Trafo, 2012), 15-50 and Maria Rosa Antognazza, "Bisterfeld and *immeatio*: Origins of a Key Concept in the Early Modern Doctrine of Universal Harmony," in *Spätrenaissance Philosophie in Deutschland 1570-1650: Entwürfe zwischen Humanismus und Konfessionalisierung, okkulten Traditionen und Schulmetaphysik*, ed. Martin Mulrow (Tübingen: Max Niemeyer Verlag, 2009), 64-81.

¹³⁷ Comenius, *Triertium Catholicum*, 15.4 (p. 99); cf. Gottfried Wilhelm Leibniz, *G. W. Leibniz's Monadology: An Edition for Students*, ed. Nicholas Rescher (Pittsburgh, PA: University of Pittsburgh Press, 1991), th. 48, 56 (pp. 23-4).

¹³⁸ Paolo Rossi, *Logic and the Art of Memory: The Quest for a Universal Language*, trans. Stephen Clucas (Chicago: University of Chicago Press, 2000), 176-84.

¹³⁹ Comenius, *Triertium Catholicum*, 15.1-12 (pp. 98-102).

character of the doctrine of the Trinity, he also saw it as eminently rational.¹⁴⁰ Likewise, Leibniz's most famous contribution to mathematics, the theory of the calculus, despite some important similarities, ultimately seems to have represented a very different approach to *mathesis* than that of Comenius or Cusa himself. While the older scholarship argued for a marked continuity between Cusa's own geometrical reasoning on the infinite and Leibniz's calculus, more recent scholarship has identified a fundamental difference in their understanding of the infinite.¹⁴¹ Significantly, nowhere is this clearer than in their very different approaches to squaring the circle. For Leibniz's own attempt to do this by suppressing the distinction between line and curve is, as Johannes Hoff suggests, the very antithesis of Cusa's coincidence of opposites.¹⁴²

In an important article Pavel Floss has argued that Comenius and Descartes represent the culmination of two different strands of the Cusan inheritance in early modernity. In particular, he suggests that Comenius developed Cusa's dialectical approach to reality and Descartes his mathematical approach.¹⁴³ In this sense, the separation of these two strands contributes to one of the key dilemmas of the Enlightenment: the growing gap between finite and infinite referred to above. However, while these two strands clearly became detached in Descartes and Leibniz, in Comenius we find the mathematical and dialectical (or mystical) bound together within the knot of the coincidence of opposites. In this we may clearly see Comenius, treading with Cusa, an alternative "passage to modernity."¹⁴⁴

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¹⁴⁰ Maria Rosa Antognazza, *Leibniz on the Trinity and Incarnation: Reason and Revelation in the Seventeenth Century* (New Haven, CT: Yale University Press, 2007), xv-xviii, 30-3, 70.

¹⁴¹ See Eberhard Knobloch, "Galileo and Leibniz: Different Approaches to Infinity," *Archive for History of Exact Sciences* 54 (1999): 87-99 and David Rabouin, "Infini Mathématique et Infini Métaphysique: D'Un Bon Usage de Leibniz pour lire Cues (... et d'Autres)," *Revue de Métaphysique et de Morale* 70 (2011-12): 203-220. Knobloch argues that while Galileo, via Cusa, was indebted to a non-quanta notion of the infinite, Leibniz pioneered a quanta approach. I am indebted to Jan Makovský for discussion of these points.

¹⁴² Johannes Hoff, *The Analogical Turn: Rethinking Modernity with Nicholas of Cusa* (Grand Rapids, MI: Eerdmans, 2013), 65-6. However, this is not to deny other important mathematical affinities. For discussion of this see Jan Makovský's chapter in this volume.

¹⁴³ Pavel Floss, "Comenius und Descartes," *Zeitschrift für philosophische Forschung* 26:2 (1972): 242.

¹⁴⁴ Louis Dupré, *Passage to Modernity: An Essay in the Hermeneutics of Nature and Culture* (New Haven, CT: Yale University Press, 1993), 57-61, 174-89 sees Cusa as seeking to prevent the late medieval dissociation of nature and grace.

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