

Brill's Companion to the Reception of Pythagoras and Pythagoreanism in the Middle Ages and the Renaissance

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Pythagorean Number Mysticism in the Renaissance. An Overview

Jean-Pierre Brach

Frequently considered, in earlier periods of Western culture, as a symbol or, at the very least, as an almost legendary individual,¹ Pythagoras is nevertheless perceived during the Renaissance as retaining more of an historical consistency, and the reality of his existence remains generally unquestioned, if somewhat imprecise. Among other exponents of the supposed *prisca theologia*,² he stands as a typical example of a single individual retaining the characteristics of a prophet, holy man, seeker of wisdom, political adviser, scientist, musician and philosopher alike, all qualities which play a central role in the culturally widened humanistic definitions of a “Pythagorean” philosophy. One must of course keep in mind that philosophy is here considered as being essentially of a revelatory nature, and much akin to a divine illumination, an empowerment which some of the Early Modern Humanists frequently bestowed on antique thinkers and religious figures,³ endowing them with a prophetic status almost equal to that hitherto reserved by Christianity for the Jewish Scriptures.

As recently outlined by Christiane L. Joost-Gaugier, the influence of (neo) Pythagoreanism in the Renaissance is both manifold and widespread.⁴ It covers most areas in the realms of science and the arts,⁵ but is nevertheless

1 Something he already was, for the most part, in Plato's or Aristotle's time; Riedweg 2008, 42ff.; Macris 2018, 810–818 (with bibliography).

2 Gentile 2012.

3 They were probably also influenced by the “divine” character commonly attributed to Pythagoras by his Hellenistic bio/hagiographers. Macris 2003 and 2006.

4 Allen 2014; Joost-Gaugier 2009 (this study is, however, to be consulted with extreme caution).

5 Perillié 2005. In this respect one must also recall the important role played by mathematics (in general) in the encyclopedic reorganization of knowledge launched by some of the first Humanists, as exemplified – among others – by G. Valla's (1447–1500) *De expetendis et fugiendis rebus* (Venice 1501), which includes a section on arithmology; see Tucci 2008 (I am indebted to M. Ghione for this reference).

more specifically associated with theories about the transmigration of the soul and the theo-cosmological meaning of numbers.⁶

“Pythagorean numbers” is one of the favorite and most frequent Early Modern designations of what is often termed nowadays “number mysticism,”⁷ “arithmology,”⁸ sometimes “arithmosophy.” Widespread in the Middle Ages, in the wake of Augustine and many other Church Fathers,⁹ the interest in the qualitative side of mathematics is at a relatively low ebb during the scholastic period, due to the then dominance of Aristotelian doctrines in Latin theology, since these deny number any sort of natural efficacy, besides being a mere reckoning tool.¹⁰

Given this situation, the Renaissance or Early Modern period (15th–17th centuries) inherits for the most part the practice of number symbolism as a hermeneutical tool, mainly concerned with the interpretation of Scripture and aiming at shedding light on the network of spiritual analogies and correspondences assumed to be linking both Testaments.¹¹

However, the persistent influence of Boethius (*ca* 480–524), who conferred its definitive philosophical luster in the Latin West to the doctrine of the theological transpositions of number,¹² and that of Nicholas of Cusa (1401–1464), who established mathematics as constituting the most appropriate basis and symbols for the knowledge of the divine sphere,¹³ must not be forgotten or understated, the more so since they are both heavily dependent on Neoplatonic (and Neopythagorean) sources.¹⁴

6 Riedweg 2008, 128–133, stressing the role played by Platonic reinterpretations in the interest displayed by later periods in “Pythagorean” philosophy.

7 The barbaric term “numerology” designates contemporary pseudo-divinatory techniques linking numbers to names, the study of which lies outside our topic. For an effective criticism of this trend, see Bell 1933.

8 Delatte 1915, 139–140; Zhmud 2013, 2016, 2019 and 2020.

9 Kalvesmaki 2013; Brach 2013.

10 Aristotle, *Metaphysics* M.6, 1080b 16, for example. Porro 2018.

11 Brach 2015.

12 Masi 1983. As is well known, Boethius’ *De institutione arithmetica* is in fact an adaptation of (and philosophical commentary upon) a Neopythagorean textbook (end of 2nd century CE) by Nicomachus of Gerasa (see Nicomachus 1926).

13 Rusconi 2011.

14 Counet 2000.

1 Coming into One's Pythagorean Inheritance

Heavily indebted to his reading of Plato and of Neoplatonic philosophers, whose works he famously translated into Latin,¹⁵ Marsilio Ficino's (1433–1499) Pythagoreanism is as much about religion as it is about philosophy.

In presenting it in this guise, Ficino is being faithful to his image of the Samian as a *priscus theologus*, as well as – very likely – to his own desire of projecting himself as the last-in-line heir to such ancient doctrines and, accordingly, as their rightful exponent in contemporary Florentine learned circles.¹⁶ The main avenues of this so-called Pythagorean doctrine are numbers on the one hand, “psychology” on the other hand. Psychology revolves here around the questions of the transmigration of the soul, of its immortality and of its purification prior to its ascension towards the divine, bearing consequently on practical religion and ethics as well.¹⁷

Number is supposedly at the root of a science of universal realities, including immaterial ones, and acts as both a cosmogonic and an ontologically productive principle.¹⁸ Accordingly, Ficino writes:

There are two ways, especially, to understand the truth of divine things, namely, mathematics and the purity of the soul.¹⁹

On the whole, Ficino's interest in number symbolism hasn't yet been made the object of the overall study it certainly deserves,²⁰ perhaps on account of the fact that the relevant references on the topic, far from being systematically arranged, are mostly scattered through his lengthy and numerous treatises and commentaries.

It is worth noting from the outset that, paradoxically, neither Ficino²¹ nor any of the very first authors who have contributed to the rehabilitation of

15 Iamblichus figures prominently among these philosophers, as the author of one of Pythagoras' biographies alluded to above and of several other treatises on Pythagoreanism and mathematics; Iamblichus 2006; O'Meara 1989 and 2014; Bechtel and O'Meara 2000; Macris 2009.

16 Celenza 1999, 705–706; Vasoli 2005.

17 Important to the moral and mystical preparation or purification of the soul are the famous *symbola*, familiar to the Christian tradition since Antiquity and much read in the Renaissance; see Celenza 1999, 693; 2001a, 4–34 and 2002; Robinson 2013.

18 Celenza 1999, 702–705.

19 Quoted by Celenza 1999, 694, n. 88.

20 A partial exception to this is the book by Allen 1994.

21 Ficino has also shown a penchant towards geometrical symbolism: Allen 1999; Toussaint 2000.

number symbolism within early Renaissance culture wrote a treatise specifically dedicated to this topic. There are several reasons for this, the main one being probably that numbers and their qualitative aspects, both ontological and cognitive, were perceived as integral parts of a more general cosmo-theological worldview, based on correspondences, correlative thinking and philosophical syncretism.

As we shall see, a systematic treatment of the subject of number mysticism belongs to a relatively later phase of the evolution of Western “esoteric” literature.

2 “That Which Is Old and New”: Number, Magic and Kabbalah

As early as 1486, in his famous, so-called *Oration on the Dignity of Man*,²² Pico della Mirandola (1463–1494) claimed to have somehow rediscovered number symbolism as a “new way of philosophizing by numbers,” and announced his intention to restore it as a speculative current *à part entière*, on a par with Neoplatonism, magic and kabbalah. Consequently, arithmology ceases to be mainly a hermeneutical tool for the interpretation of passages from the Bible, to become – to a certain extent – an almost autonomous “art of numbers” capable of addressing (and answering) problems of cosmology, morals, metaphysics or theology.²³ In his *Conclusiones* (or 900 *Theses*; 1486) and *Apology* (1487), Pico introduces the concept of “formal number,” implicating that mathematical entities – in typical Neoplatonic fashion – possess a specific ontological status, corresponding to a particular (rational) cognitive mode. Pertaining to an intermediary level of reality, situated above the material plane, the “formal numbers” are endowed with the faculty of bestowing “a power and an efficacy” on natural things which belong to the – less “formal,” therefore less “actual” – physical degree of existence. In this manner, Pico relies much less on hackneyed numerical analogies than on the close interaction of the cognitive and ontological properties of arithmetic. Number is thus assimilated to a “formal,” secondary cause, active on the material world.²⁴

The idea according to which the more “formal” is endowed with a higher, more powerful degree of being than the material, is of course Pico’s version of a classic Neoplatonic tenet which holds that immaterial entities are actually

22 Copenhaver 2016.

23 See his 85 “mathematical conclusions” in Farmer 1998, 466–485 (especially the fourth one, pp. 466–467).

24 Brach 2016b, 412ff.

situated higher up the ontological scale and are thus, paradoxically, correlated to a denser level of existence – and of intellectual capture – than that ordinarily occupied or entailed by physical realities.

Among other things, numbers are therefore perceived as capable of functioning on different planes, thus permitting their actual use in different disciplines such as natural philosophy, magic or kabbalah.

Since these disciplines, among a series of others, are presented by Pico (in his *Conclusiones*, essentially) as displayed according to an ascending hierarchical order, albeit closely articulated to one another,²⁵ it follows that material (or purely quantitative) number – as a cognitive tool in natural philosophy – must take a back seat to its formal (or Pythagorean) counterpart²⁶ and further, when dealing with Jewish theosophical literature, to its even higher kabbalistic analogue, the ten *sefirot*.²⁷ In the same way, kabbalah – as a supra-discursive practice – stands above magic and natural philosophy, and leads towards the union with the Active Intellect by transforming man into an angel – a theory which is at the root of the later, widespread assimilation of kabbalah with angelic magic, popularized by the likes of Jean Thénau (ca 1480–1542) and Heinrich-Cornelius Agrippa (1486–1535).²⁸

Even though he does not make use of the expression “formal number” as such, Johann Reuchlin (1455–1522) is familiar with Pico’s (and Ficino’s) theories.²⁹ He nevertheless takes the problem from a different angle, by first stating the identity of Pythagoreanism and of the kabbalah, and furthermore calling the former a derivation from the latter.³⁰ Although an apocryphal antiquity was frequently ascribed to Jewish kabbalah by its first Christian interpreters, Reuchlin’s historical twist is probably also intended to deflect an eventual charge of judaizing, coupled to a tendency to present kabbalistic materials as a “symbolic philosophy,” akin therefore to the method supposedly lying at the core of Pythagorean teachings.³¹ As Pico before him, Reuchlin

25 Farmer 1998, 495 (“Magical Conclusion n° 4”) and 499 (“Magical Conclusion n° 15”); Pico della Mirandola 1572, v, 170; Fornaciari 2010.

26 Farmer 1998, 465 (“Mathematical Conclusion n° 5”) and 469 (“Mathematical Conclusion n° 6”). Pico later abandoned this Pythagorean outlook, as shown by Valcke 1985.

27 Wirszubski 1989 holds the opinion that “formal number” is for Pico merely synonymous with *sefira*, the respective occurrences of both expressions simply varying with the context, according to him; *contra*, see Buzzetta 2019, 94–104.

28 In book III of his *De occulta philosophia libri tres* (Heinrich-Cornelius Agrippa 1992 [ed. V. Perrone Compagni], 402ff.); Brach 2016a. On J. Thénau, Fabre and Polizzi 2020.

29 Zika 1998, 171–176 (and *passim*); Leinkauf 1999.

30 These assertions are found in the introduction to his famous 1517 *De arte cabalistica* (Johann Reuchlin 1993); Zika 1998, 144–154.

31 Celenza 2001; Idel 2014; Schmidt-Biggemann 2016.

was conscious of the fact that Hebrew letters possessed numerical values, thus turning words and, above all, divine or angelic names into proper numbers.³² An example of this is the importance assigned to the quaternary, considered in its expression either by the “divine *tetractys*”³³ of the Pythagoreans or by the *Tetragrammaton*, the most sacred Biblical name of God, composed of four letters.³⁴ In a similar way, the ten *sefirot* were also described by him as both divine aspects or attributes and intelligible numbers whose essence is derived from that of the divine intellect. Here again, numbers are presented as intermediary terms between natural and divine realities, simultaneously separate (like divine things) and inseparable (like natural objects) from matter and, thus, enabling the human intellect to transition smoothly from one plane to the other. From the conjunction of the primordial Unity and the infinite Dyad (or Binary), numbers “flow” according to a process of emanation and constitute, with their subsequent production of the *tetractys* and of the Decad, a progression which, through dots, lines, plane figures, solid figures and physical, three-dimensional bodies, finally gives birth to the whole cosmos, down to its basic natural constituents.

3 The French Connection: Pythagoras, from Natural Magic to Christian Mysticism

Initially influenced – like Reuchlin – by the Florentine authors³⁵ and obviously borne by the growth of the printing industry, a “French school” of arithmology followed suit and popularized the topic of both numerical and geometrical symbolism within learned circles, from the early 16th century onwards.

This led to the elaboration of various inquiries into mathematical analogies, as well as to a corresponding number of sub-genres within the relevant literature, represented by books which in some cases have later become famous. In

32 In this manner, numbers are also associated with the specific kind of Christian theurgy previously addressed by Reuchlin in his 1494 *De Verbo mirifico* (*On the Wonder-Working Word*); Roling 1999.

33 Riedweg 2008, 80–89; the *tetractys* originally designates a sacred oath formula including the first four numbers; the word as such means “fourthness.”

34 Johann Reuchlin 1993, *passim*.

35 J. Lefèvre d'Étaples traveled to Italy for the first time during the Winter of 1491–1492 and met, among others, Ficino and Pico. Like Pico, he distanced himself rapidly enough from Ficino's involvement with magic and from the use of kabbalah, to turn towards Christian mysticism, under the combined influences of N. of Cusa and [Ps.-]Denys the Areopagite; see J.-M. Mandosio in Lefèvre d'Étaples 2018, VII–LVII.

this regard, one must be aware that the qualitative aspects of number are considered, by our set of writers, as essential to the study of its arithmetical properties, in proper “Pythagorean” (and Neoplatonic) fashion. This underlines that the philosophical or religious meanings ascribed to numerical entities were actually believed to be the result of certain formal characteristics, which represent the transposition of their respective quantitative values on subtler or immaterial planes of reality, thereby illustrating the indissoluble link between the two faces of number: contemplative and scientific.

It is an essentially speculative approach to mathematics that was initiated by Jacques Lefèvre d’Etaples (?1460–1536). Lefèvre himself dedicated Book II of his early and hitherto unpublished *De magia naturali* (written in 1494) to the practical role supposedly played by numbers in natural magic.³⁶ As underlined by J.-M. Mandosio, his magic is essentially of an astral kind,³⁷ and numbers are at the root of celestial influences on the terrestrial world.

Assimilated by Lefèvre to “ideas,” numbers constitute the source of the living “chains” linking the different levels of existence and manifesting the network of correspondences between sublunar and celestial worlds (and creatures). Here again, numerical entities exhibit both an ontological and a cognitive aspect, since they allow us an intellectual grasp of (and supposed magical mastery over) the interplay of influences which maintain the life of the whole universe, while at the same time being (*qua* “ideas”) the true *rationale* behind those influences and their transmission, from beyond the heavenly spheres. To this downward progression corresponds analogically (and in typical Neoplatonic fashion) an upward one, the *ascensio mentis* along the *scala numerorum*, eventually identified with the celestial spheres and angelic hierarchies, a testimonial, for the author, to the affinities between “ideas” and angels, that is, between Lefèvre’s “Pythagorean philosophy” and Christian theology.³⁸ With the implication, moreover, of numbers as they appear in the constitution of divine names,³⁹ Pythagoreanism and theology are henceforth conflated, along with magic, in a peculiar form of Christian kabbalah underlining the power of divine names (and, therefore, of numbers) in the production of wonders and miracles – natural and otherwise –, ultimately culminating in the paramount name of Jesus, in accordance with Reuchlin’s (and Cusa’s) early views on the “wonder-working Name.”⁴⁰

36 Mandosio 2013, 37–79.

37 Ibid., 43; Lefèvre d’Etaples 2018, LIX–XCIX.

38 Mandosio 2013, 72–76.

39 Again, through the numerical values of Hebrew letters, as with Pico or Reuchlin.

40 See n. 32 above; Wilkinson 2015, 313ff.

Lefèvre's parallel interest in ordinary mathematics, culminating in the publication of several textbooks (1496) and in an edition of both Boethius' *De arithmetica* (1503)⁴¹ and Euclid's *Elements* (1517), exerted a major influence on several French members of his erudite circle who, between 1510/11 and 1521, in Paris, published a few treatises on number symbolism.

Charles de Bovelles (1479–1567) offers a highly philosophical exposition of the ontology of number and of the correlated *elevatio mentis* towards the supreme Unity, supported by geometrical considerations which frequently owe much to Cardinal Nicholas of Cusa's (1401–1464) *Docta ignorantia* (*On Learned Ignorance*, 1440).⁴² Besides that of Cusa, other recognizable influences on Bovelles' metaphysics are those of R. Lull, G. Pico and M. Ficino.⁴³

A true pioneer in the study of geometry,⁴⁴ his interest and proficiency in this discipline were famous among his contemporaries. Many of his scientific treatises actually exhibit a strong tendency to dwell on the practical applications of geometry, as well as on the formal analogies between mathematical figures or bodies and natural objects, in true Pythagorean fashion.

Bovelles' combined penchant for the mechanistic aspects of science was part of a general didactic purpose, and of a plan to reform the contemporary cursus of studies in the field. Both endeavours can possibly be conceived of as parallel or complementary to Lefèvre's own efforts at the Cardinal Lemoine College in Paris (where Bovelles was his pupil, from 1495, and later also taught), as well as to his slightly later involvement in the (religious, this time) formation of laymen and of the clergy, alongside the bishop and reformer Guillaume Briçonnet (1470–1534) and his "Groupe de Meaux" (1521–1525).

In contradiction, however, with N. of Cusa's or L. Pacioli's (see *infra*) views in this respect, number symbolism, in Bovelles' work, is linked to the philosophical precedence ascribed to arithmetic over geometry. A Platonic commonplace, this superiority of number is linked to its greater "abstraction" and supposed capacity to lift up the mind from physical realities to the intellectual ones.⁴⁵ Being "immaterial," numerical entities appear to Bovelles better suited

41 See n. 12 above. This interest does not keep him, Bovelles or Clichtove from pointing – from the earliest years of the 16th century – to the opportunities offered by mathematical studies for the purification of the soul and its contemplative ascent, as shown by several texts published in Rice Jr 1972, *passim*; Oosterhoff 2018.

42 See Nicholas of Cusa 2013.

43 Victor 1978, 45–46 who also points to his lesser involvement with religious reform, compared to that of his other three colleagues.

44 He was actually the first to publish a manual of geometry in French (Paris: H. Estienne, 1511).

45 As the author puts it: "Numbers are more elevated than magnitudes and more concealed, since they are posited in the soul, whereas magnitudes are more accessible and belong to corporeal reality" (Charles de Bovelles 1512, fol. 69v°; my translation).

than geometry to support the anagogical movement of the spirit towards the divine.⁴⁶ In this sense, geometry⁴⁷ can serve as a preliminary introduction to both the science of arithmetic as such, and to its mystical interpretation. This last aspect is discussed in the *Book of the Twelve Numbers*,⁴⁸ dedicated to the mystical analogies of the first twelve integers, considered separately and in their natural order. Relatively important aspects of its contents are the interrelation maintained between the quantitative and qualitative characteristics of certain numbers (a point already stressed above), as well as the continuation of epistolary discussions on the topic of number mysticism held in earlier years between Bovelles and others, such as Germain de Ganay (14?–1520),⁴⁹ letters which were published in the volume alongside the text itself. Scripture and Christian theological considerations are remarkably absent (apart from the theme of the Heavenly Jerusalem *a propos* the number 12) from the *Liber de duodecim numeris*, which insists on the scalar properties which, through their correspondences and analogies on the various planes of being, constitute numbers as ontological intermediaries in the intellectual ascension towards Unity.

Accompanying certain chapters, several charts and diagrams attempt, by ordering and classifying them, to synthesize the manifold numerical analogies associated with a given number (such as 4 and 6). These charts may have exerted an influence on those presented, somewhat later, in Book II of Agrippa's *Occult Philosophy*,⁵⁰ in chapters which are essentially concerned with arithmology and its companionship with magic.

46 Such a movement is, for the author, the principal function of human reason, as developed in the *De Sapiente* (1510; Charles de Bovelles 1982). See González-García (forthcoming).

47 Bovelles actually dedicates the last book of his *Physicorum elementorum libri decem* to the symbolical correspondences of geometrical bodies. For him, however, knowledge of the Platonic polyhedra, in particular, tends towards a joint apprehension of both sensible and intelligible substances and can even lead to the contemplation of the mystery of the Trinity. Here, he may possibly be influenced by L. Pacioli (although he apparently never mentions him, unlike Lefèvre, who did so in the preface to his 1514 edition of N. of Cusa's works), as recognized by Sanders 1990, 110–112; 171–173, who also hypothesized (103, n. 37) an influence on Bovelles of Proclus' *Commentary on the First Book of Euclid's Elements* (Proclus 1970).

48 *Charles de Bovelles* 1510, which is part of a collection of tracts on different mathematical topics.

49 Vasoli 2001. To G. de Ganay were dedicated Lefèvre's *De magia naturali* and Clichtove's *Opusculum* (see *infra*). Letters on the relation between arithmology and the "three principles of natural magic" (dating back 1503–1505, to Ganay and several others) are also featured in Abbot Johann Trithemius' (1462–1516) published correspondence; Brann 1999, 117–133.

50 The use of charts is already present in Lefèvre's *De magia naturali* (Jacques Lefèvre d'Étaples 2018, 58–62) as well as in other philosophical books by Bovelles (*De Nihilo*, 1511;

Another friend of both Lefèvre and Bovelles, and their colleague at the Cardinal Lemoine College (where the study of the Liberal Arts was very much in favour), is Josse Clichtove (1472–1543), an important Humanist, ecclesiastical reformer and Catholic theologian. His only arithmological publication is his *Small Treatise on the Mystical Meaning of Numbers (contained) in the Bible* (1513).⁵¹ If Bovelles sometimes made use of certain medieval sources,⁵² Clichtove – anticipating in this regard the rather conservative theological stance he was later to adopt – took number symbolism all the way back to its medieval understanding, as a tool for the interpretation of numerical passages in Scripture. The main goal of this learned booklet is thus exegetical in nature, aiming as it does to illuminate the reading and meditation of the Bible by the mystical resources offered by number symbolism. Unlike in Bovelles' case, scriptural and Christian references are central to the author's purpose, as he solely references texts emanating from the Church fathers, medieval theologians or ecclesiastical writers in general.⁵³ Yet, as a result of this attitude, and in a manner akin to that of Bovelles' *Liber de duodecim numeris*, esoteric speculations about the "occult" disciplines (such as magic, kabbalah, Hermeticism, etc) are remarkably absent from Clichtove's concise dissertation, which examines numbers according to their natural order of succession but pushes it (in conformity with the contents of Scripture) much further than the duodenary to which Bovelles actually limits himself.

Another (and last) author, a member of the "Groupe de Meaux," who was familiar with Lefèvre's circle and who benefited also, at the end of his life, from the protection of Marguerite d'Angoulême (1492–1549),⁵⁴ is bishop Gérard Roussel (1500 ?–1555 ?), who published in 1521 a learned arithmological commentary on Boethius' *De arithmetica* (using Lefèvre's earlier edition of the Latin text).⁵⁵ Roussel's *mystica numerorum applicatio* is a chapter-by-chapter commentary, frequently longer than the original text, exploring all manners of

Charles de Bovelles 1983) and – extensively – in Gérard Roussel's commentary on Boethius (see *infra*). It seems to be a pedagogical device typical of treatises involving mathematics and emanated from this French circle; Oosterhoff (forthcoming).

51 Josse Clichtove 1513. This text actually happens to be the first purely arithmological tract to have been printed separately – the one by Bovelles being part of a larger collection of texts, as already stated above: Massaut 1968.

52 Céard 1982.

53 Even though he does mention Pythagoras and Aristotle in his "Preface" to Germain de Ganay.

54 Her spiritual director, between 1521 and 1524, was none other than Guillaume Briçonnet himself; see Martineau, Vaissière and Heller 1975–1979.

55 Printed by S. de Colines: Paris 1521. A copy of this work, annotated by the French Christian kabbalist Guillaume Postel (1510–1581), is now in the collections of the Bibliotheca

analogical transpositions of numbers and displaying a vast amount of erudition in school mathematics and music, philosophy, theology and arithmology. Here again, and by necessity, the link between qualitative and quantitative number comes to the fore, as do the didactic preoccupations, manifested by a great number of diagrams and charts inserted in the text. In writing his commentary, Roussel has somehow authored a second *De arithmetica*, of a number symbolical kind this time, a textbook celebrating the manifold deployment of basic numerical properties (examined by Boethius) in the realms of Biblical exegesis, philosophy, musical science or theology, with the help of a vast array of references ranging from Antiquity to his own time, from scientific writers (such as Euclid or Jordanus) to Christian thinkers.

In true Pythagorean fashion, geometrical considerations are developed on the basis of the study of figured numbers. Besides that of his sources, Roussel's doctrinal eclecticism – religious and philosophical – is likely a corollary of his preoccupation with instruction in general, and the spiritual edification in his readers – a preoccupation which comes as no surprise from yet another member of the evangelical “Groupe de Meaux.” Number, quantitative measurement, proportion and their mutual relations serve here as rational unifying factors under the tutelage of Scripture and of Christian tenets, in a new, humanistic version of the Augustinian theological paradigm consisting of Holy Writ, Reason and Tradition.

4 Allocating Beauty: Proportion, Art, Architecture

Equally removed from preoccupations with “esotericism,” magic and/or the kabbalah, Luca Pacioli's (ca 1447–1517) *De divina proportione*⁵⁶ is nevertheless a curious book made famous by its woodcuts (designed after Leonardo da Vinci's (1452–1519) drawings) illustrating all sorts of geometrical bodies. Juxtaposing theoretical and more technically oriented parts, with an essentially pedagogical aim,⁵⁷ the work's main argument is about the importance of mathematics in general for the understanding of nature, and concerns

Philosophica Hermetica in Amsterdam; Secret 1977, 115–132 (“II. Annotations de G. Postel à une *Arithmetica* de Boèce, commentée par Gérard Roussel”).

56 Luca Pacioli 1509 (composed in Milan ca 1496–98).

57 Despite its Latin title, the whole work is actually written in Italian, which obviously contributed to its success. A translator of Euclid in Latin (1509) and, possibly, in Italian as well, Pacioli privately taught mathematics and accountancy throughout Italy for most of his career; Bucciarelli and Zorzetto 2018.

specifically the so-called “Golden Mean” (or “Golden Section”)⁵⁸ and its application to architecture and the arts. Culled from both Euclid’s *Elements* and Plato’s *Timaeus* (55a ff.), with passing references to Pythagoras, the mathematical and symbolic properties of this geometrical division in mean and extreme ratio, as well as those of the five regular polyhedra, express the perfection of five fundamental divine attributes⁵⁹ and how such a perfection actually mirrors itself, according to Pacioli, in the fabric of the universe: the shape of “the All” (or “quintessence”) is – according to Plato – the dodecahedron (a solid with twelve pentagonal faces), for the construction of which Euclid makes use of the “divine proportion,” thus indicating the analogy between this ratio and the supernal force at work behind the creation. Seen from this perspective, geometry is more intrinsically concerned – compared with number itself – with material and corporeal measures, quantities and dimensions, insofar as these reflect, in the author’s view, the divine perfections and the manner in which they intervene in the pattern of creation.

The second part of the work – an architectural treatise – examines the proportions of the human body, as compared to those found by Vitruvius in classical architecture.⁶⁰

5 Pythagorean Syntheses

Wholly diverse in nature and scope from the preceding works, although very much “Pythagorean” (as well as kabbalistic) in spirit, is the bulky *De harmonia mundi* published in Venice by the Franciscan monk, Christian kabbalist and theologian Francesco Zorzi (1466–1540).⁶¹ This encyclopedic and influential tome, replete with the most eclectic philosophical erudition, is concerned with the fabric and constitution of the universe, understood in terms of musical harmony, based in turn on mathematical analogies and proportions.⁶² Divided into three main “canticles” (further subdivided in eight “tones” each⁶³) respectively correlated to God (Creation), Christ (Redemption) and Man (Reintegration), and also to the classic threefold division of nature (angelic,

58 A particular case of the geometric proportional mean (of the type $ac = b^2$). Neveux 1995.

59 Unicity, trinity, transcendence, immutability and creative wisdom.

60 Giusti and Maccagni 1994.

61 Francesco Zorzi 2010.

62 Chaignet 1874, t. 2, 330ff.

63 In imitation of the musical octave.

heavenly and terrestrial),⁶⁴ the *De harmonia mundi* offers a vast synthetical *exposé* of the mysteries of creation and of their symbolical relation to the divine Unity. Under the influence of Pico, Ficino and Reuchlin (among so many other sources), Zorzi attempts to explain, via the symbolism of the Pythagorean *tetractys* (and denary),⁶⁵ allied to that of the ten *sefirot* or divine aspects mirroring each other within the universe, the relations between Unity and multiplicity, in marked Neoplatonic fashion. Central to his approach is the concept of the reducibility of creation to a symbolical language, ultimately identified with numbers. Manifesting themselves in the constitution of names/words, musical rhythm and proportions, numbers illustrate the harmony which supposedly describes and encrypts the ontological kinship between Unity and its hidden expressions, which make up the multiple universe. Centered on Man, understood as created in God's image and, therefore, as a perfect synthesis of the macrocosm, the third "canticle" evokes the eschatological harmony foreshadowed in man's structure. The relations of the human soul to the body are expressed in terms of musical proportions (borrowed mainly from a famous passage in Plato's *Timaeus* 35a ff.), as is the entire hierarchy of beings in the universe, which is actually based on the number 27 (another feature from the *Timaeus*). 27 represents the "perfect cube" of 3, considered here as the principal number of reference and the root of the entire harmony of creation,⁶⁶ whose ultimate, perfect development is precisely symbolized by 27. The *De harmonia mundi*, therefore, presents itself as an architectural model of reality, a model whose origin and final achievement coincide in God and are anticipated in Man and in his mystical reintegration. Such themes are described according to an immense network of numerical proportions and analogies, which supposedly account for the actual layout of creation as well as for the scheme of its future reintegration, conditioned by Man's spiritual evolution and expressed in recurring musical harmonies, in a *pars pro toto* scalar ontological ascension.

It is worth noting that, on at least one occasion, Zorzi even had the opportunity of applying his musical, kabbalistic and arithmological principles to concrete architectural planning and realizations. This took place during his

64 Such a division is also meant to recall the tripartite structure of Dante's poem, on which Zorzi left a commentary; Francesco Giorgio Veneto 1991.

65 Although Zorzi's focus here is mostly on number 9 and its multiples, he nevertheless explicitly mentions both the Pythagoreans and Plato *a propos* the denary. On these two different understandings of the Decad, Deretić and Knežević 2020. (I owe this reference, as well as several others regarding Antiquity, to the kind generosity of my colleague Constantinos Macris.)

66 The creation itself is organized by Zorzi according to a scale of 9 (3^2), number of the angelic orders according to [Ps.-] Denys the Areopagite.

intervention in the reconstruction works undertaken at the church of the Franciscan convent of San Francesco della Vigna in Venice, for which he wrote a memoir (1535) dealing with the proportional analogies between the human body and the proposed monument that he felt (in agreement with the principal builder, Jacopo Sansovino) should be respected in the erection of the new building.⁶⁷

An avid reader – and sometimes almost self-declared plagiarist – of Pico, Ficino, Reuchlin, Zorzi and their likes, and a friend and visitor of Trithemius,⁶⁸ the already mentioned H.-C. Agrippa is the author of a well-known and very influential treatise on magic, entitled *De occulta philosophia*.⁶⁹ In this work he devotes no less than fifteen chapters⁷⁰ to the numbers from 1 to 12 and beyond. Each of these chapters usually fills up between 1 and 3 pages of the book (the longest being devoted to the septenary), and is followed by a chart simultaneously summarizing and expanding the text by presenting the manifold correspondences and analogies governed by the relevant number, displayed according to a six-fold division.⁷¹ Most especially concerned in this part of the book with the role played by mathematics in the three different types of magic he famously correlates with the natural, celestial and “intellectual” (i.e., angelic) worlds, Agrippa devotes as many brief introductory chapters to the nature and importance of number as such. Against the backdrop of a significant array of classical, medieval and contemporary authorities, he posits a Christian Neoplatonic understanding of number as the archetype of created things in the divine intellect, possessing a real kinship with the “ideas” and responsible for the cohesion of the whole universe, both on the functional and ontological levels. Distributed and active on all planes of existence, number is thus the origin of the secrets and mysteries of creation, in the natural, celestial and “divine” (angelic) realms.⁷² Needless to say, Agrippa is here exclusively concerned with what he calls “formal and rational” mathematics, as opposed to their “material” counterpart. In a way which is very much inspired by Pico, he insists on the *formalis ratio* present in “natural” number, which is the

67 Foscari and Tafuri 1983.

68 The abbot was the actual dedicatee of the first version of Agrippa's *Occult Philosophy*, which has been preserved in manuscript.

69 See n. 28 above. I am quoting from this critical edition of the text.

70 Heinrich-Cornelius Agrippa 1992, 249–299.

71 The division in question is composed of elements belonging successively to the divine or “archetypal” world, to the three-fold partition of the cosmos, to the “microcosmos” (Man) and to the infernal world. The chapter devoted to the number 12 has 2 charts, respectively concerned with kabbalistic and “Orphic” doctrines – an obvious echo of Pico's syncretism; Lehrich 2003.

72 Heinrich-Cornelius Agrippa 1992, book II, chap. 2, pp. 252–253.

rationale behind the mysteries of God and of Nature compounded in “abstract” mathematical entities. One must be capable of effecting the conjunction and consonance of those numbers with the divine ones, in order to understand and operate the wonders that can be brought about via the magical use of mathematics. Still following Pico’s wake, Agrippa holds that numbers pertaining to the first decad actually refer to divine realities and that those belonging to the tens, hundreds and thousands indicate the celestial, terrestrial and eschatological planes respectively. He then proceeds to correlate the three mathematical means⁷³ to the relations between the parts of the soul, of the body and of the whole living being.⁷⁴

Although he was also a versatile, yet leading scientist of the Elisabethan Renaissance, and consequently much more personally interested in the varied practical applications of mathematics than Agrippa ever was, it is another magician,⁷⁵ John Dee (1527–1608), who took it upon himself to write an important preface to the first English translation of Euclid’s *Elements*, published in 1570.⁷⁶ In this seminal text, Dee articulated a spirited defence of the usefulness of applied mathematics in general (of which he was himself a skilled practitioner⁷⁷) to an *encomium* of “formal number” as the superior level of mathematical entities and of their understanding.⁷⁸ Dee shares with Pacioli (albeit in the course of a single text instead of several successive treatises, and despite considerable differences in tone and intent), a willingness to write in the vernacular and to attempt bridging a theological discourse on divine and cosmic harmony with certain elements belonging to scientific and practical knowledge.

Ultimately deriving from the supreme Monad, number as such is present as a pattern in the mind of the Creator, in angelic and human intellects, as well as in the natural realm. Representing the essence of reality, mathematics are thus endowed with a magical power, as they encompass all levels of creation and mediate – once again – between the divine and material spheres. Since they operate on all these planes, they are essential in implementing an ambitious synthesis of science, magic, kabbalah, and natural philosophy. Notwithstanding, Dee was also part of a long line of humanist thinkers who were not satisfied with scholarly sources and an exclusively bookish approach

73 In other words, the so-called arithmetical, geometrical and harmonic proportional means (cf. n. 58).

74 Heinrich-Cornelius Agrippa 1992, book II, ch. 3, pp. 254–255.

75 Harkness 1999; Clucas 2006.

76 London: J. Daye, 1570; reprint John Dee 1975.

77 And of which he distinguished no less than 19 different branches or *arts methodicall*.

78 Mandosio 2012.

to knowledge but who also maintained, like Pacioli or Bovelles, an interest in underlining or even developing the technical applications of algebra and geometry. In so doing, they intended to put contemporary mathematical discoveries at the immediate disposal of craftsmen and artisans alike, in order to provide them with the scientific background necessary to shed theoretical light on empirical procedures.⁷⁹

6 One of a Kind: One Number Says It All

Having secured for itself, by the last quarter of the 16th century, an epistemological legitimacy in both the scientific and philosophical fields, Pythagorean number mysticism, before it produced some encyclopedic treatments, developed a peculiar kind of essay: the study of a given symbolic or religious theme through the lenses of a monography on a single number of the Decad. Already attested in Antiquity,⁸⁰ this specific sub-genre of arithmological literature focuses most frequently on the Septenary, although some of the treatises deal with other numbers, mainly the Ternary.⁸¹

Among the most meaningful examples of such endeavours is Alessandro Farra's *Settenario dell'humana riduzione* (*Septenary of the Human Conversion*).⁸² A jurist and civil administrator, and a young member⁸³ of the newly-founded literary Academy of the *Affidati* in the city of Pavia, Farra composed his most conspicuous *opus* according to a seven-fold division. Under the strong (and avowed) influence of Pico and Ficino, his *Settenario* is a spiritual and philosophical discourse mixing up Pythagorean and kabbalistic themes about the seven steps of the mystical itinerary of the soul. Number symbolism is particularly influential in the seventh and final section of the book, the one devoted to the *filosofia simbolica ovvero le imprese* (the “symbolic philosophy or the images”),⁸⁴ which represents the final stage of the *riduzione* (conversion) mentioned in the title, in other words the acquisition of wisdom. Such wisdom resides, for Farra, in the contemplation of the intelligible principles regulating the cosmic proportions, accessed through numerical and geometrical symbols

79 Brach 2015, 115–117.

80 Especially, but not exclusively, for the Septenary. Cf. L. Zhmud's works (cited above, n. 8).

81 A list of these (to which may be added Croci's *Breve discorso della perfezione del numero ternario* [see Antonio Croci 1623]) can be found in Brach 1994, 76, 84, 90, 92, 94.

82 Alessandro Farra 1571/1594.

83 Born some time during the 1540's, Farra was elected in 1562. The Academy typically specialized in works of rhetorics and eloquence.

84 For a more detailed analysis, see Brach 1994, 73–75; Maggi 1998, 23–45.

manifesting the network of correspondences at work behind the harmony of creation.

Shortly afterwards, Fabio Paolini (ca 1550–1604) also published his *Hebdomades sive Septem de Septenario libri* (*Hebdomads, or Seven Books on the Septenary*),⁸⁵ which constitute a learned commentary on a single verse of Virgil's *Aeneid*.⁸⁶ A trained Humanist and physician, and a teacher of both the Greek and Latin languages and literature in several local institutions, Paolini is also a founding member of the second Venetian Academy, that of the *Uranici* (1587–1593). Certainly his most famous work, the *Hebdomades* represent an encyclopedic treatment of rhetorics and poetry, combined with speculative philosophy, astrology and symbolism, under the joint influences of Ficino, Pico, and his friend, the famous musician Gioseffo Zarlino (1517–1590).⁸⁷ The mere existence of treatises like Farra's or Paolini's (as well as of many others, dedicated to a single number) actually testifies to the widespread interest for the art of memory within the learned circles and Academies of Northern Italy. In such a context, the art of memory is combined with number symbolism, Ficinian astral magic, Christian kabbalah and musical theories as practical means to enhance the perception of both cosmic and esthetic harmony. Paolini develops a syncretic theory, which closely associates Orpheus and Pythagoras, who symbolically stand for the poetic/emotional and mathematical aspects of music, respectively. At the top of the septenary scale of knowledge, the mysteries of “natural magic” and “theology” (chap. 6 and 7) are conjoined with those of Pythagorean (or “ideal”) numbers (chap. 5) in order to activate and vivify the three types of music originally distinguished by Boethius,⁸⁸ which are combined in turn with poetic discourse to actually produce the most perfect kind of harmony, supposedly capable of achieving all wonders, spiritual and otherwise,⁸⁹ and of which Orpheus is the symbol.

Quite similar speculations about the cosmological use of numbers, associating rhetoric, literature, poetical declamation and music, but somewhat less preoccupied with purely magical background or goals, are found in the works of the 17th-century author Teodato Osio (1605–1673). This little known writer published a spate of books in Milan, between 1637 and 1668, about the application of mathematics and music to the rhythm of Latin and Italian poetry and

85 Fabio Paolini 1589.

86 *Aen.* VI, 646: *Obloquitur numeris septem discrimina vocum* ([Orpheus] “accompanies their voices with the seven-note scale”).

87 Vasoli 1998, 193–210, part. 204–207; McDonald 2012, 222–248.

88 *Musica humana, intrumentalis, mundana* (vocal, instrumental and “cosmic” music).

89 Radaelli 1999.

prose,⁹⁰ along with another work on architecture and land surveying.⁹¹ Osio develops some classic musical considerations about “Pythagorean” (mainly Platonic) musical theory, whose intervals and proportions he applies to the prosody and tonal accents of the languages referred to above. Assimilating the continuous and discrete modes of quantity to the “Same” and “Other” of Plato’s cosmogony in the *Timaeus*, he basically compares the components and fundamental structure of language – spoken as well as written – to the genesis of the geometric bodies, insisting on the cosmological role of proportion and numbers and bringing together the doctrine of world harmony and that of language constitution (syllables, tones, letters, word composition and etymology).⁹² In his later productions, Osio insists less on language than on philosophical considerations about discrete and continuous quantity as tools of divine creation and fundamental elements of the universe, associated with the three main proportional means (see above) and to the terms of the famous quotation of the *Book of Wisdom*,⁹³ drawing analogies between the divine operations and those of human craftsmen. Dealing occasionally with magic and divination (using a method combining astrology, mathematics and music), such a cosmological discourse constitutes a very curious and understudied instance of Platonic speculations about nature and mathematical harmony in Northern Italy around the middle of the 17th century.

7 Pythagorean Number as a Philosophical Abstraction

The quite complex and much-studied natural philosophy and cosmology of Giordano Bruno (1548–1600) harbour a very personal conception of number and of “mathematical magic” which – despite the well-known influence of Agrippa on the *De monade, numero et figura*⁹⁴ – has in fact little to do with Pythagorean number mysticism as understood in the present article.⁹⁵ The Neoplatonic scheme of the *scala entis* and the correlative distribution of mathematical entities along its ontological hierarchy, let alone their “magical” power over physical realities, have no place in Bruno’s thought. Although the *De monade* appears outwardly as a *compendium* of the significations attached to each number of the primary Decad, presented in their natural order, the

⁹⁰ Teodato Osio 1637, 1653 and 1668.

⁹¹ Id. 1639.

⁹² Brach 1994, 90–92; Wuidar 2008, *passim*; Gaspari 2011 (who mentions several extant unpublished manuscripts on number symbolism and Pythagorean lore).

⁹³ *Book of Wisdom*, XI, 21 (“You [*sc.* God] ordered all things in measure, number and weight”).

⁹⁴ Printed with two other important Latin philosophical poems in Giordano Bruno 1591.

⁹⁵ Bonnet 2002; Giovannozzi 2012.

accent is in reality on the relations between physics and mathematics, and the focus of the book on the notions of order, form, figure and quality. As the internal components of reality, numbers and geometrical figures are essentially distinguished by their qualitative structural differences, bestowed upon them by the multiplicity of forms. Their main role is to order natural realities, receiving from them the qualitative determinations of which mere abstract quantity is devoid in itself. Abstract quantity as such belongs to the logical plane, intrinsically superior to the imagination but unable, nevertheless, to activate it. However, since all forms are dependent on the unique universal substance, mathematical abstraction, accounting for their common characters, allows us to grasp the relations of these multiple forms to the unity of their *substratum*, and thus to apprehend the underlying substantial constitution of being. The science of numbers leads us therefore towards the understanding of the unity of being and, conversely, geometry sheds light on the process by which plurality, intrinsically immanent to this unity, is actually deployed in the outward existence of forms and figures. By these considerations,⁹⁶ Bruno shows the ancillary character of both arithmetic and geometry towards natural philosophy and metaphysics; as well as their common abstract character, intermediary between the essence of reality and its material expansion.⁹⁷

In his magical writings (drafted between 1588 and 1592⁹⁸), whose contents are rooted in the natural philosophy elaborated in the earlier Italian dialogues (such as *De la causa, principio e uno*, *Cena delle ceneri*, and others), Bruno actually criticizes Agrippa's conception of the effective relation between language and being. Natural magic, for Bruno, is really inseparable from the physical properties of things and beings, and not subject to occult virtues.

8 Pythagoreanism as the Key to Universal Knowledge

An encyclopedic dimension is conferred to Pythagorean number symbolism by the publication of Pietro Bongo's (?-1601) enormously erudite *Numerorum Mysteria*.⁹⁹ Written by a member of an ancient and noble family from Bergamo,

96 Naturally somewhat oversimplified here; for a detailed study of the general status of mathematical disciplines in G. Bruno's works, Bönker-Vallon 1995.

97 Such a hierarchy is only valid on the cognitive plane, and is not to be understood as implying an ontological counterpart. The scalar nature of being is entirely deconstructed in Bruno's works, from the so-called "Italian Dialogues" onwards.

98 They include texts such as the *De magia mathematica* (ca 1590; Giordano Bruno 1999) and *Theses de magia* (in Id. 2000).

99 Definitive and most complete impression Bergamo: Ventura 1599 (reprint Pietro Bongo 1983); cf. Ernst 1983; Piccinini 1984.

Canon of the local Sant'Alessandro cathedral, this thick *quarto* tome is entirely dedicated to the tradition of "Pythagoreanism," and draws from every conceivable source available at the time, including magical, Hermetic, kabbalistic and esoteric writings (Lull, Cusa, Pico, Ficino, Lefèvre d'Étaples, Bovelles, Zorzi, Dee, etc.). The book was frequently criticized for its motley and untidy character, which often degenerates in a mere mosaic of quotations.¹⁰⁰ Bongo nevertheless remained aware in it of certain theoretical issues at stake in his days. For instance, the growing opposition between traditional thinking (based on analogy, correspondences and the powers hidden in the essence of things) and a more modern trend of thought, which attempted to read the world through the lenses of experience and of a scientific *mathesis*, was not lost on him. Bongo contrasted the Book of Nature with that of Scripture, and exhibited an understanding of *pythagorica disciplina* as based on Tradition and authority, and as essentially concerned with scrutinizing the divine mysteries. Such a perspective naturally retained a strong theological flavor, insisting on the supposed *consensus* between Pythagoreanism (as Bongo understood it) and post-Tridentine Catholic perspectives. The symbolical use of numbers is here viewed not just as a general key to the harmony of reality and of spiritual life but also as an ontological principle at work behind the layout of creation.

Through its several editions and the echo it found in other contemporary publications, Bongo's treatise was instrumental in establishing number mysticism as a specific and relevant humanistic topic, of which it became one of the foremost textbooks, thus strongly contributing to the acceptance of such speculations into the body of mainstream scholarly culture.¹⁰¹

Thirty years later, the then archbishop of Milano Federico Borromeo (1564–1631) had an extremely limited number of copies of his *De pythagoricis numeris*¹⁰² printed by the press established in the archbishopric by his distant cousin and predecessor on the Milan seat, the more famous Carlo Borromeo (1538–1584).¹⁰³ Here again, Pythagoreanism is considered as standing in the midst between religion and science, and viewed from a dual, contemplative and scientific, perspective on nature, typical of the early 17th century, a period sometimes as wary of esoteric speculations (both Borromeos were champions of the Catholic Counter-Reform in Italy) as it was defiant of certain

100 Seen from the opposite perspective, this feature helps making the book a useful dictionary of the allegorical meanings of numbers, which almost all artistic or intellectual trades could indifferently tap into.

101 Baroni 2012.

102 Federico Borromeo 2016.

103 Burgio and Ceriotti 2002.

requirements of scientific methods. The book examines the nature and properties of numbers, as well as their usefulness in the rational study of natural mechanisms, while leaving aside or criticizing their “occult,” magical, divinatory or kabbalistic aspects, for which the author had entertained a strong interest in his youth but which he now scorned.¹⁰⁴ As an aside, we may note that, following a collaboration between the two men which apparently started in late 1610 or early 1611, F. Borromeo became the dedicatee of the *Taumatologia*¹⁰⁵ written by Giovan Battista Della Porta (1535–1615). Parts of this work deal with the natural powers attributed to numbers and music, a topic certainly reminiscent of Pico della Mirandola and consonant with Della Porta’s famous interest in natural magic.¹⁰⁶ The *De pythagoricis numeris* enjoyed almost no circulation at all and was therefore virtually unknown; it was, however, rediscovered and quoted in recent times by the Florentine mathematician and specialist of Pythagoreanism Arturo Reghini (1878–1946).¹⁰⁷

Another contemporary encyclopedic presentation of Pythagorean number philosophy¹⁰⁸ – albeit of a very different kind – is that of the famous English theosopher Robert Fludd (1574–1637).¹⁰⁹ Chapters on this topic open the second volume of his *Utriusque cosmi ... historia*,¹¹⁰ dedicated to the “microcosm,” according to the leading theme and structural principle of the entire *opus*, which is the fundamental analogy between the two corresponding worlds, the universe and man. The analogy is in fact tripartite, according to Fludd, and includes the divine sphere, of which both the macro- and microcosm are supposedly perfect images. Following a classical (since Augustine) interpretation of this theory, the pattern of creation is essentially modelled on the ternary, as the expression of the three-fold operation of the Trinity. Beginning with “divine numbers,” which he also calls “supersubstantial numbers,” naturally

104 In the same year and place, F. Borromeo also published his *De cabbalisticis inventis libri duo* (Federico Borromeo 1978); see Campanini 2002. The famous Neoplatonic philosopher Francesco Patrizi (1529–1597) has left a hitherto unpublished manuscript *De numerorum mysteriis* (*On the Mysteries of Numbers*, 1594) dedicated to F. Borromeo, who was his pupil at the time (a critical edition of the text was announced a long time ago by Maria Muccillo).

105 It is possible that this work remained uncompleted and unpublished; extant fragments in Giovan Battista Della Porta 2013.

106 Bertolini 2017 (my thanks to M. Ghione for this reference); Verardi 2018, 138–140.

107 Reghini 2004, 46ff.

108 Akin, to a certain extent, to Zorzi’s *Harmonia mundi*, although quite different of course in many respects.

109 Huffman 1988 and 2001; Janacek 2011, 43–74.

110 Robert Fludd 1617–1619.

extolling the importance of the Monad and of its created counterpart, the geometrical point, Fludd goes on to examine the mystical Dyad, and then the Ternary. He expands on the relation of the Trinity to the Monad, and on the manifold triadic correspondences within both worlds. Numbers and musical/harmonic proportions rule the general layout of the cosmic structure as well as the ratios between its different tiers, the whole argument being superbly illustrated by many engravings which have vastly contributed to making Fludd's work famous and helped initiate (along with Khunrath and a few others) the trend of "cosmo-theosophical" illustrations in 17th-century alchemical and Rosicrucian books.¹¹¹

The author does make use of the expression "formal numbers" and, in his quest for universal knowledge,¹¹² imitates Agrippa in applying the primary Decad to the Godhead and the first, essential principles, the tens to the angelic spheres, the hundreds to the celestial world and the thousands to the sublunar universe and its basic elements.

The same tripartite blueprint necessarily applies to Man as microcosm, organized according to the ternary of intellect, soul and body and their hierarchy ruled by musical proportions and harmony. Divine influences on both the lesser and greater worlds are mediated by the celestial forces and this universal vitalism reminds us that the network of natural correspondences is to Fludd a basic component of reality, embedded into the *machina mundi* and essential to both its life and operation. The same goes for Pythagorean numbers which, for him, exert an action which is far from being merely symbolical or abstract; they constitute, on the contrary, an integral part of the intimate nature of the universe and of its workings, as well as an essential tool for their understanding.

Although more limited in scope and bulk than Bongo's or Fludd's books, Jan van Meurs the Elder's (1579–1639) *Denarius Pythagoricus (Pythagorean Decad)*¹¹³ and Athanasius Kircher's (1602–1680) *Arithmologia*¹¹⁴ represent typical encyclopedic treatments of number symbolism.

The former work is essentially a systematic inventory of classical sources concerning Pythagorean number theory. It consists mostly of an array of quotations about the nature and definition of number, its basic constitution (odd and even, male and female, perfect and imperfect, etc.) and the characteristics

111 Szulakowska 2011; Forshaw 2016.

112 Akin to Kircher's in this respect but of course quite different in tone, spirit and intentions.

113 Johannes Meursius 1631.

114 Athanasius Kircher 1665 (the full title in English reads: *Arithmology, or the Hidden Mysteries of Numbers*). See Leinkauf 1993, 192–235.

and mythological correspondences attached to the components of the Decad, examined according to their natural order. Unsurprisingly, the references are chiefly taken from pagan sources (literary, poetical, philosophical, historical) and a good number of Greek and Latin Church Fathers, who have frequently expressed theological views about scriptural numbers. By contrast, the majority of medieval authorities – with the exception of Boethius and a few other Western and Byzantine writers – are shunned by this Protestant historian, famous for his erudition but lacking in philosophical creativity. Speculation, moreover, is not the goal of the present *opus*, which is mainly descriptive, and aims at a didactic presentation of the topic, enhanced by several useful reference indexes.

One of the greatest and most famous polymaths of the 17th century, the Jesuit A. Kircher has dedicated a specific treatise to number symbolism. Although not one of his best-known books (probably because it is also of much less value to book-lovers than some of his other, richly illustrated productions¹¹⁵), the *Arithmologia* nevertheless reveals its author's interest for "occult" speculations – an interest Kircher had to rein in prudently, given the context of post-Tridentine Catholicism.

The book is divided in six parts, and deals with all sorts of topics linked to number symbolism: digits or numerical characters and their symbolism; the so-called "magic squares" and their astrological use in Antiquity, as well as in Judaic and Arabic religious cultures; divination by numbers, using magical seals and number combinations; amulets, angelic seals and magical alphabets based on numerals and geometrical figures. The last chapter, entitled "The mystical signification of numbers," considers the Decad and its multiple analogies and correspondences in Nature.

In an age thirsting for universal knowledge, the *Arithmologia* intends to be an encyclopedic presentation of its topic, synthesizing the different doctrinal, magical and astrological aspects of number mysticism, as Kircher understands it. Apart from its vast erudition, the book clearly betrays its author's fascination for the kind of unorthodox speculations he is examining. Kircher justifies his interest in number magic and symbolism by assuming a dual necessity: first, to bring back to light this material by extracting it from its ancient, more or less reputable pagan or Christian sources; second, to salvage it from "heretical" contexts and criticize its eventual denaturation. Finally, his ultimate goal is to reintegrate these views within the scope of contemporary knowledge, and

115 Such as the *Mundus subterraneus*, published in the same year, or his *Oedipus Aegyptiacus* (1652–1654).

present them henceforth as acceptable and legitimate from the points of view of theology, science and natural philosophy.¹¹⁶

9 Pythagoras: Stranger in a Strange Land

From what we have seen above, pythagorean tenets about number and/or geometry, as understood during the Renaissance, are generally reinterpreted through neoplatonic lenses, which root the study of natural philosophy and cosmology in an ontological and theological viewpoint. Central, here, is the christianized idea of numbers being essentially a divine model, the essential principles of things, present in God's intellect and which serve as a pattern for the organization of the cosmos.

Conversely, numbers and geometrical figures are equally perceived as a scalar support for the ascension of the human mind from earthly matters towards the unitive contemplation of the immaterial being (*theosis, deificatio*), thus blending an ontological *and* a cognitive approach to the nature of reality and of the Godhead. Such a stance, in which theological considerations actually govern scientific knowledge, paves the way for doctrines which treat the qualitative aspects of number as superior to and ruling over the quantitative and material ones, yet maintaining a strict relationship between both: physical and metaphysical numbers are never very far removed, let alone independent, from one another.

Thus, Pythagorean arithmology is linked to a conception of number as "efficient cause," as well as to the doctrines of the unicity of creation and of the analogies and correspondences linking its different planes, of which man himself is a mirror, on an obviously smaller scale.

The progressive decline of such an organic worldview within European culture, from the late 16th and 17th century onwards, inevitably entailed the increasing scientific irrelevance of the currents of thought which depended on it, including of course that of arithmology and of other esoteric tenets which frequently resorted to it. Gradually, number found itself reduced to the status of a mere logical operator, devoid of any reference to a living, inner essence of things, thus rendering meaningless its previous role as a "factor of enchantment" within creation, mediating between material and spiritual realities. Harmony and proportions are no longer construed as key elements in the language of Nature – a language which is henceforth treated as both physically

116 Fletcher 2011, 53, 161–170, 174.

and metaphysically autonomous *vis-à-vis* the theological discourse. While analyzing the geometrical and quantitative aspects of space and of natural order, mathematicians develop a new *mathesis universalis* which aims at renovating the understanding of the relationship between knowledge and being. The components of the universe are therefore viewed as immanent, mechanical constructs submitted to quantitative laws, *in lieu* of elements of a pattern in the mind of God; accordingly, their study may no longer be conducted in terms of a quest for the mystic harmonies of numbers and of geometrical proportions, nor expressed cogently as the unfolding of a providential design, already inscribed in the nature of things by way of their mathematical structure.

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