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PYTHAGORAS AND PYTHAGOREANISM

JOSCELYN GODWIN

1 Life and Work of Pythagoras

The giant figure of Pythagoras straddles the borderline between history and myth. As in the case of his approximate contemporaries Zoroaster, Mahavira, Confucius, Lao Tse, and Gautama Buddha, his followers created an idealized biography that cannot be checked against impartial sources.[1] Even then, they differ widely in their accounts, most of which date from the third century CE, eight centuries after their subject. Consequently, we cannot confirm any of the biographical data, nor even give firm dates for Pythagoras's birth and death.

Certainly his homeland was the Dodecanese island of Samos, and his birth occurred between 580 and 569 BCE. According to Iamblichus and Porphyry, he was born in Syria where his father Mnesarchus (a Phoenician by origin) was trading. After many travels, he settled in southern Italy, founding a school and community at Croton. Around 500 BCE, local opposition destroyed the school, and if Pythagoras did not perish then and there, he died in Metapontum during the following decade. This is the bare outline with which modern scholarship has to be content.

Turning to the legendary life of Pythagoras as reported by the same authors, we find him first studying with the Ionian philosophers Thales and Anaximander, and with Pherecydes of Syros. Next came his voyages to the Phoenician settlements in Syria, where he underwent mystery initiations. The early witness of Herodotus confirms his long residence in Egypt.

[1] Much of the source material is collected and translated in *The Pythagorean Sourcebook*, compiled by Kenneth Sylvan Guthrie (1919–1920), revised and expanded by David R. Fideler (Grand Rapids, MI: Phanes Press, 1987), including Iamblichus's *De Vita Pythagorica*. A clearer translation of Iamblichus, which divides his chapters by paragraphs, is *Iamblichus: On the Pythagorean Life*, trans. Gillian Clark (Liverpool: Liverpool University Press, 1989).

Having gone there on Thales's recommendation, Pythagoras visited the religious centers of Heliopolis, Memphis and Thebes and was admitted to initiations never before given to foreigners. A fourth, involuntary journey was to Babylon, as a captive following Cambyses's conquest of Egypt (525 BCE), but Pythagoras turned it to good use by studying astronomy and mathematics with the Magi. On his release, he returned to Samos but became increasingly at odds with his compatriots. He made a tour of the oracular centers of Delos, Samothrace, Eleusis, Grecian Thebes, Delphi, and Crete, and he visited Sparta to observe the system of government. After emigrating to Croton, he never returned to Samos.

Among the mythical aspects of Pythagoras's life, as distinct from the merely legendary ones, the third-century biographers report the Delphic Oracle's prediction of his birth; the golden thigh, which he sometimes displayed; his conversations with animals; the hailing of him "in a deep, penetrating voice" by the river Nessus; his descent into Hades and meeting with the souls there; and his bilocation, teaching simultaneously at Metapontum and at Tauromenium in Sicily.[2] These are all commonplaces of sacred biography, especially resembling events in the life of Apollonius of Tyana (first century CE). This is not surprising since Apollonius was a neo-Pythagorean and wrote a (lost) biography of the master, which served both as a source for the third-century biographers of Pythagoras and as a model for Flavius Philostratus's *Life of Apollonius of Tyana*.

More original are the claims that Pythagoras could recall his previous incarnations, and that he could hear the Harmony of the Spheres. Although these have become standard topoi with their own long histories, they have no pre-Pythagorean traditions in the Greek world, nor does reincarnation appear in the extensive Egyptian lore of the afterlife. The transmigration of a single soul into different bodies was taught in Orphism, but all that we know of Orphic teachings comes from the post-Pythagorean period. Walter Burkert suggests that Orphism itself may have been a reconstruction, claiming origin from its mythic founder but actually created by Pythagoreans,[3] just as the neo-Pythagoreans of the early centuries CE reconstructed their master's doctrines and biography. Burkert admits as a serious possibility that the doctrine of reincarnation came from India.[4]

[2] Chiefly Iamblichus and Porphyry, both of whom wrote a *Vita Pythagorae* (henceforth *VP*), and Diogenes Laertius's *Vitae philosophorum*.

[3] Walter Burkert, *Lore and Science in Ancient Pythagoreanism*, trans. Edwin L. Minar, Jr. (Cambridge, MA: Harvard University Press, 1972), 128–130.

[4] Burkert, *Lore and Science*, 133.

The first literary evidence for the Harmony of the Spheres is in Plato's *Republic* (617 b-c), which depicts Sirens singing on the planetary rings. In neo-Pythagorean and Neoplatonic doctrine, the soul hears this music as it passes through the planetary spheres on its way down to earth and back again. The harmony also has a metaphorical meaning that points to Pythagoras's achievement not as a mystic but as a proto-scientist. For if the planetary spheres are perceived to be harmonious, it must be because, like musical harmony, they obey the laws of number.

According to one of the best-known anecdotes, Pythagoras discovered the connection of harmony with number after hearing four smiths whose hammers rang on the anvil with different but consonant pitches.[5] After suspending the hammers on strings and weighing them, he found their proportions to be 12:9:8:6, namely those of an octave divided by its arithmetical and harmonic means, and thereby arrived at the quantification of musical intervals. (The fallacy in the experiment is mentioned later.) He thus anticipated both the quantitative worldview that only came into its own with the scientific revolution, and the experimental method inseparable from it, that uses mathematics as its tool.

Pythagoras's achievement in mathematics was to gather knowledge from Babylon and Egypt, civilizations already in decline, and to plant it in a Greek-speaking culture that was rising to intellectual prominence. Another possible source was Abaris, a priest of Apollo from Hyperborea (the Land beyond the North Wind), who traveled on a "golden arrow" and visited Pythagoras for a mutual exchange of wisdom.[6] Burkert, emphasizing the shamanic element in Pythagoras's character, interprets the arrow as a metaphor for the out-of-the-body flights of a Central Asian shaman.[7] Others think Abaris came from Britain and associate him with the geographer Pytheas of Massilia's report of a thriving, musical cult of Apollo in a circular temple there.[8] As Alexander Thom's research has shown, the megalithic temple builders of Britain used "Pythagorean triangles" (right-angled triangles based on whole numbers) as their principles of construction.[9] The principles of the five "Pythagorean solids" (later renamed "Platonic solids") were also known there in Neolithic times, as witness the many carefully carved specimens found in Scotland.[10]

[5] Iamblichus, *VP*, ch. 26, para. 115–121.
[6] Iamblichus, *VP*, 19, 90–93; 32, 215–218.
[7] Burkert, *Lore and Science*, 150, 162.
[8] Diodorus Siculus, *Bibliotheca Historica*, II, 3.
[9] See Alexander Thom, *Megalithic Sites in Britain* (Oxford: Oxford University Press, 1967), 27, 77–80.
[10] See Keith Critchlow, *Time Stands Still: New Light on Megalithic Science* (London, Gordon Fraser, 1979), 131–135.

For Pythagoras, numbers were the ultimate realities. While exoterically he enjoined piety to the gods and made bloodless sacrifices to them, it was against the esoteric background of a purely mathematical metaphysics. The primary and sacred symbol of this metaphysics was the Tetraktys, a triangle made from ten dots in rows of 1, 2, 3, and 4. The first ten numbers all carried metaphysical meanings, being similar to what Plato would later style the "forms" or "ideas" underlying all manifestation. The arithmetical series of the Tetraktys could be extended indefinitely to the whole realm of the limited or bounded (Gk. *peras*), as opposed to the unlimited or infinite (*apeiron*). These are the first pair of opposites into which the Pythagoreans divided the world of experience. Aristotle gives the list: Limited/Unlimited, Odd/Even, One/Many, Right/Left, Male/Female, Rest/Motion, Straight/Crooked, Light/Darkness, Good/Bad, Square/Oblong.[11]

Pythagoras's ethical teaching took the form of brief sentences or maxims and survives in three main collections: the "Symbols" (39 of which are explained in Iamblichus's *Exhortation to Philosophy*), the *Golden Verses* (preserved with a commentary by Hierocles of Alexandria, fifth century CE), and the "Sentences" (451 of which are collected in *The Sentences of Sextus*).[12] They range from statements such as "God dwells in the intellect of the wise man" and maxims, for example "Possess those things that no one can take away from you," to gnomic sayings: "Do not poke fire with a sword" and "Abstain from beans." The latter prohibition, for which the Pythagoreans were much mocked, has never been satisfactorily explained.

Although Diogenes Laertius reports that Pythagoras wrote several treatises, none survive. His chief method of teaching was oral, adapted to the various classes of listeners. The *akousmatikoi* or "auditors" assembled, perhaps by hundreds, to learn elementary precepts proclaimed by Pythagoras from behind a curtain. Five years of probation as silent auditors were required before disciples could progress to the status of *mathematikoi* or "those devoted to learning." These, also called the *esōteroi* ("initiates into secret matters") saw Pythagoras and learned his mathematical, cosmological, and musical principles.

Unusual for its time, the school was coeducational: Iamblichus names seventeen "illustrious Pythagorean women." The students lived a common life under a regime of abstinence from animal food and wine except in connection with sacred rites, the renunciation of fame and wealth, and sexual restraint. As a family man, Pythagoras encouraged monogamous marriage

[11] Aristotle, *Metaphysics*, 986a 25.

[12] Translations in Guthrie, *The Pythagorean Sourcebook*, 159–165, 267–274.

and the eugenic breeding of children. He controlled the emotions of his disciples by singing to the accompaniment of the lyre, adjusting the music to stimulate, calm, or cure body and soul. Porphyry adds that he danced, too. On occasion, he was able to avert disaster by knowing what kind of music would turn a man away from violence. But much as these tales enchanted later readers, it is impossible to disentangle Pythagoras's own practices from those of his later disciples, and difficult to distinguish reportage from invention.

From all the likely and unlikely stories, there remains the central ideal of the philosophic life, dedicated to the love of wisdom and to the benefits that this brings to the whole world.

2 Pythagoreans in the Classical World

After the destruction of the school in Croton, some of the survivors settled in mainland Greece and founded new schools. Others continued the tradition in Italy, including Philolaus of Croton or Tarentum (born ca. 470 BCE), who wrote the earliest surviving account of Pythagoras's metaphysical and astronomical teachings. Philolaus's student was Archytas of Tarentum, whom Plato visited in 388 BCE.

Plato's dialogue *Timaeus* is the earliest large-scale monument to the Pythagorean mentality, and the most lasting in its influence. In the *Republic*, Socrates prescribes for the Guardians of the ideal state the study of arithmetic, geometry (plane and solid, the latter called "stereometry"), astronomy, and harmony, adding: "These sciences are closely akin, as the Pythagoreans say, and we agree with them, Glaucon."[13] The Myth of Er at the end of the same dialogue presents reincarnation, if not as a doctrine, then as a plausible object of belief. According to Aristotle, the main differences between Plato's philosophy and that of "the Italians" (meaning the Pythagoreans) were (1) that Plato regarded numbers not as ultimate realities, but as intermediate between the sensible world and the forms and (2) that Plato's primary opposites were not the Limited and the Unlimited (as with the Pythagoreans), but the One and the Dyad, the latter producing all numbers.[14] Plato was reproached, as was Empedocles before him, for having disclosed the Pythagorean secrets, and he was excluded from the school.[15]

[13] Plato, *Republic*, VII, 530d.
[14] Aristotle, *Metaphysics*, I, 6, 987b.
[15] Diogenes Laertius, VIII, 27.

But were these secrets merely the mathematical disciplines just mentioned? Several recent researchers have given a glimpse of a formidable intellectual structure mostly unsuspected by mainstream classical studies. Musicologist Anne Macaulay (1924–1998), in a controversial work about Pythagoras's patron deity Apollo, analyses the Greek letters that make up the name of that god as comprising a geometrical diagram of circles and rectangles.[16] Among other surprises, these yield proportions that are the same as those of the seven strings of the cithara (large lyre). Macaulay thought that the Greeks had adopted a musical-mathematical-astronomical complex dating from megalithic times, which again recalls Abaris the Hyperborean.

David Fideler, following the Greek letter-number correspondences known as gematria, shows in *Jesus Christ, Sun of God* that the numbers of the names APOLLO (1061), ZEUS (612), LYRA (531), and HERMES (353) are related as a musical twelfth, divided by its geometric and harmonic means.[17] Moreover, the word TETRAKTYS sums appropriately to 1234, and PYTHAGORAS to 864 ($2^5 \times 3^3$, divisible by the important cosmological numbers 72 and 108). Such discoveries imply that the Greek alphabet and the orthography of divine names and other important terms were deliberately "rigged" to incorporate mathematical and musical theorems.

Ernest McClain, another musicologist, observes that "From a musician's perspective, Plato's *Republic* embodies a treatise on equal temperament."[18] In *The Pythagorean Plato*, he demonstrates that whenever Plato mentions a number, it conceals a reference to musical intervals and tuning systems. McClain traces analogous phenomena in Vedic, Babylonian, Egyptian, Hebrew, and early Christian texts, and he explains, "In this sea of restless change man discovered an island he could trust, the octave of ratio 1:2 – the 'basic miracle of music' – functioning as a matrix for all smaller intervals and providing a metric basis for a tonal algebra."[19]

The English polymath John Michell, in *The Dimensions of Paradise*, approaches the Platonic myths from a geometric viewpoint. Having established a connection between Greek gematria and the measurements of the earth and moon in traditional units, Michell shows that Plato was conversant

[16] Anne Macaulay, "Apollo: The Pythagorean Definition of God," in *Homage to Pythagoras: Rediscovering Sacred Science*, ed. Christopher Bamford (Hudson, NY: Lindisfarne Press, 1994), 245–270.

[17] David Fideler, *Jesus Christ, Sun of God: Ancient Cosmology and Early Christian Symbolism* (Wheaton, IL: Quest Books, 1993), 220–221.

[18] Ernest G. McClain, *The Pythagorean Plato, Prelude to the Song Itself* (Stony Brook, NY: Nicolas Hays, 1978), 5.

[19] Ernest G. McClain, *The Myth of Invariance: The Origin of the Gods, Mathematics and Music from the Rg Veda to Plato* (Stony Brook, NY: Nicolas Hays, 1976), 196.

with this secret system, which was passed on to the early Christians and incorporated into the Greek Testament.[20] Any of these discoveries, taken separately, might be ignored, but taken together they alert one to the possible existence of an early esoteric synthesis that demands further study.

As other philosophical schools came to prominence, the remaining Pythagoreans probably cultivated the more mystical and occult pursuits, such as resurfaced in the first neo-Pythagorean revival. Nigidius Fignlus (98–45 BCE), a Roman praetor and friend of Cicero, founded a neo-Pythagorean order, which according to rumor practiced astrology and magic, using child mediums and other means of divination.[21] An underground meeting hall or chapel at the Porta Maggiore in Rome, built in the first century CE but only discovered in 1917, may have had some connection with Nigidius's order, and it certainly belonged to a kindred esoteric cult. The Roman historian Jérôme Carcopino, interpreting its stucco decorations as allegories of the soul's journey, did not hesitate to call the building a "Pythagorean basilica."

In a different vein, Philo of Alexandria (20 BCE–40 CE) applied Pythagorean mathematical concepts to the interpretation of his native Hebrew scriptures, making a synthesis of Jewish and Greek thought. For Philo, it was Moses who heard the Harmony of the Spheres and composed songs in every mode that replicated the heavenly motions, moving even the angels.[22] Philo's work on the Creation story of Genesis (*De Opificio Mundi*) celebrates the universal powers of the number seven in a way that comes as close as his theology allows to its deification. Although not classed as a kabbalist, Philo anticipated the later discipline of Kabbalah through his esoteric and arithmological reading of the Torah.

In the early centuries CE, neo-Pythagoreanism was indistinctly blended with Neoplatonism, with the Roman revival of the Orphic and Dionysiac mysteries, and even with elements of Christianity. However, it was Pythagorean mathematics, music theory, and metaphysics that had the most staying power and imbued the entire Neoplatonic movement. In the Middle Platonist period of the second century CE, Theon of Smyrna, Nicomachus of Gerasa, and Numenius of Apamea all wrote handbooks on mathematics and music in a Pythagorean vein. Of the third-century Neoplatonists, Plotinus (205–269/70) was less Pythagorean, his successor Porphyry (232/3–ca. 305) more so, and Iamblichus (ca. 250–ca. 325) most

[20] John Michell, *The Dimensions of Paradise: The Proportions and Symbolic Numbers of Ancient Cosmology* (London: Thames & Hudson, 1988), 33–35, 59–62, 101–106.

[21] *Magici pueri*, according to Apuleius, *Apologia*, 42.

[22] Philo, *De Somniis*, I, vi, 35; *De Virtutibus*, XI, 72.

of all. Yet Plotinus's ascetic leanings, his hierarchy of levels of being emanating from the One, and his own philosophic ecstasies continue typical Pythagorean themes. Porphyry and Iamblichus both wrote treatises on Pythagorean arithmetic; Porphyry also wrote lost works on geometry, astronomy, and harmonics. Boethius (ca. 480–524) would later name the four disciplines of arithmetic, geometry, music, and astronomy the *quadrivium* (crossroads), and they would survive as the backbone – or straitjacket – of scientific education into the Middle Ages and beyond.

Of the late Neoplatonists, Proclus (412–485) was a mathematician as well as one of the most profound commentators on Plato. By his time, the establishment of Christianity in the Roman Empire had provoked an angry reaction on the part of philosophers. They used Plato as the inspiration of an alternative theology, polytheist and emanationist rather than monotheist and creationist, and answered the need for religious experience through theurgy (the summoning of the gods through ritual and meditation).

St. Augustine (354–430), who had been a Platonist before his conversion, enthusiastically followed Philo's example in applying arithmology to biblical exegesis, and he validated elements of the Pythagorean-Platonic tradition for the Christian intellectual world. Other late classical writers under Pythagorean influence include Macrobius, Martianus Capella, Censorinus, Aristeides Quintilianus, and Calcidius. Last of all come Damascius and Simplicius, who emigrated to Persia in 529 CE when Emperor Justinian forbade pagans to teach philosophy and closed the Athenian Academy.

A well-received theory proposed by Michel Tardieu, of the Collège de France, states that Simplicius never returned to Athens but settled in Harran (the Roman Carrhae, now in southeast Turkey).[23] That would explain a missing link in the Pythagorean chain, for it was in Harran that the mysterious Sabians maintained a pagan cult with Hermes Trismegistus as its prophet and the worship of the seven planets as its principal rite. A century later, the Brethren of Purity (Ikhwān al-Safa') flourished in Basra (southern Iraq); although no direct connection with the Sabians of Harran exists, there is a suspicious community of interest. By the year 1000, the Brethren had completed an encyclopedia in fifty-two volumes that is still read in the Muslim world. The *quadrivial* disciplines play a large part in it, and the volume on music is especially Pythagorean, treating both music's influence on body and soul and planet-tone correspondences.

[23] Michel Tardieu, *Les paysages reliques, routes et haltes Syriennes d'Isidore à Simplicius* (Leuven: Peeters, 1990).

3 Later Pythagoreans

The Church Fathers approved of Pythagoras for promoting universal love, teaching the immortality of the soul, and founding the sciences of number. The Royal Portal of Chartres Cathedral (ca. 1160) includes him among ancient masters of the Seven Liberal Arts, and many manuscripts depict him experimenting with the four hammers or sounding the monochord. From this time onward, the dual Pythagorean themes of the Harmony of the Spheres and the power of music became commonplaces of literature and poetry.

The Florentine Platonists, with their access to Greek sources, could better appreciate Pythagoras's stature. Pico della Mirandola's *Conclusiones sive Theses DCCCC* (1486) contained fourteen extremely obscure "Pythagorean Conclusions, after Pythagorean Mathematics," mostly drawn from Proclus's commentaries on Plato. Marsilio Ficino included translations of the Pythagorean symbols and *Golden Verses* in his much-reprinted anthology of mystical and magical Neoplatonism.[24] In Venice, the friar Francesco Giorgi (1466–1540) wrote a tremendous work of kahbalistic and Pythagorean arithmology, *Harmonia Mundi* (1525), and advised the architects of the Venetian church of San Francesco della Vigna, whose plan is based on the number nine.

Johannes Kepler (1571–1630) spurned arithmology but shared Giorgi's conviction that the keys to understanding the cosmos lie in geometry and harmony. He had read in Pliny and Censorinus that Pythagoras measured the planetary distances according to musical intervals; even if Kepler had more accurate figures, he trusted the principle. Many years of calculation convinced him that the planetary distances accord with the five Pythagorean solids,[25] and, after many more, that God had designed the planetary orbits so as to create a splendid, ever-changing harmony.[26]

Kepler's laws of planetary motion opened the path for the discoveries of Isaac Newton (1643–1727), who revisited the story of the hammers and came to a radical conclusion.[27] As noted, the results of Pythagoras's reported experiment were false, for to produce tones in the ratio 12:9:8:6, the weights hung on equal strings would have had to be proportioned as the *squares* of

[24] *Iamblichus de mysteriis* [etc.], Venice, Aldus Manutius, 1497.

[25] The subject of *Mysterium Cosmographicum*, Tübingen, 1596.

[26] The subject of *Harmonices Mundi Libri V*, Linz, 1619.

[27] For Newton's text, from the Classical Scholia on the *Principia Mathematica*, see J. Godwin, *Harmony of the Spheres: A Sourcebook of the Pythagorean Tradition in Music* (Rochester, VT: Inner Traditions, 1993), 304–308.

those numbers. But by applying this principle to the heavens, it revealed the inverse square law of universal gravitation. Newton humbly concluded that he had only rediscovered a law that the Pythagoreans had concealed in the story of the hammers and the idea of the Harmony of the Spheres. In the field of optics, Newton made his own quasi-Pythagorean discovery. Through experimentation with sunlight shining through prisms, he found that the colors of the spectrum are related in the same proportions as the tones of the diatonic scale.[28]

After Newton, the Pythagorean current parted company with experimental science, because the latter no longer saw the cosmos as harmonized through sacred number, nor nature as ensouled. Pythagorean arithmology persisted in esoteric traditions, especially combined with Christian Kabbalah. It also figured in Freemasonry, notably in the Ancient and Accepted Scottish Rite, which treats arithmology in its twenty-eighth degree (Knight of the Sun, or Prince Adept).

Toward 1800, self-identified Pythagoreans appeared in London and Paris. The classical scholar Thomas Taylor (1758–1835) was notoriously neopagan, vegetarian, and anti-Christian and lived an austere philosophic life. He served English readers as Ficino had readers of Latin, by translating the Platonic and Neoplatonic corpus. This included Iamblichus's *Life of Pythagoras* (1818) and a compilation on *Theoretic Arithmetic* (1816). Taylor's passion for his material affected the English poets, including his friend William Blake. He was read and admired by the American Transcendentalists, the Theosophists, the Shrine of Wisdom,[29] and the circle around the English poet and Blake scholar Kathleen Raine (1908–2003).[30]

Antoine Fabre d'Olivet (1767–1825) is another example of a non-Christian esotericist. He published a French translation of the *Golden Verses* with long commentaries extolling the Pythagorean life and principles.[31] His posthumously published treatise on music is also thoroughly Pythagorean in spirit.[32] Toward the end of his life, he founded an esoteric order that taught

[28] See Penelope Gouk, *Music, Science and Natural Magic in Seventeenth-Century England* (New Haven: Yale University Press, 1999), 237–246, which also shows the fallacies in Newton's experiment.

[29] An anonymous group based near Godalming, Surrey, which published a journal and a number of translations of Neoplatonic and theosophic texts.

[30] Founder of the Temenos Academy, London.

[31] Antoine Fabre d'Olivet, *Les Vers dorés de Pythagore, expliqués*, Paris, 1813. English translation by Nayán Louise Redfield, *The Golden Verses of Pythagoras* (New York: G. P. Putnam's Sons, 1913).

[32] Antoine Fabre d'Olivet, *La Musique expliquée comme science et comme art*, Paris, Dorbon Ainé, 1928. English translation by J. Godwin, *Music Explained as Science and Art* (Rochester, VT: Inner Traditions, 1987). (Later entitled *The Secret Lore of Music.*)

the immortality of the soul, the science of number and sacred geometry, and the hierarchy of worlds and their inhabitants.[33] The French occult revival of the nineteenth century, strongly influenced by Fabre d'Olivet, saw many attempts to explain the cosmos through the sciences of number and harmony. The present writer has gathered and analyzed these in his study *Music and the Occult.*[34] They culminated in *L'architecture naturelle* (1949) by the pseudonymous author Petrus Talemarianus, which integrates Pythagoreanism with elements of Taoism, Tantrism, Kabbalah, and alchemy.

The Traditionalist René Guénon (1886–1951), in his study of Dante, recognized the importance for the poet of the *quadrivium*, and especially of arithmology as a guiding principle of the *Divine Comedy*. Guénon writes: "Though this symbolism [of numbers] is not uniquely Pythagorean, and can be found in other doctrines for the simple reason that Truth is One, we may still entertain the thought that from Pythagoras to Virgil and from Virgil to Dante, the 'chain of tradition' was probably never broken on Italian soil."[35] Some believe that the chain continued into modern times through ill-documented groups such as the Pednosophers, the Priseurs, and the Tabaccologists.[36]

Certainly it was in Italy that the most vigorous modern revivals of Pythagoreanism occurred, beginning around 1907 with the meeting of Arturo Reghini (1878–1946), a mathematics teacher and keen Freemason, with the musician Amedeo Armentano (1886–1966). Armentano initiated Reghini into a secret Pythagorean order, the Schola Italica, which claimed ancient roots. In 1909, the two of them founded the Rito Filosofico Italiano (Italian Philosophic Rite) in an attempt to reform Freemasonry from the inside, and in 1913 the Sodalizio Pitagorico (Pythagorean Association). Reghini was an outspoken neo-pagan, rejecting both Christianity and popular occultism in favor of self-transformation through inner alchemy and philosophic study. In 1927, he and Julius Evola (1898–1974) co-founded the magical Gruppo di Ur, and Reghini was a main contributor to its journal *Ur.*[37] In later life, marginalized by Fascism's alliance with the Catholic

[33] See Antoine Fabre d'Olivet, *La vraie maçonnerie et la céleste culture*, ed. Léon Cellier (Lausanne: La Proue, 1973).

[34] Joscelyn Godwin, *Music and the Occult: French Musical Philosophies, 1750–1950* (Rochester, NY: University of Rochester Press, 1995). First published as *L'ésotérisme musical en France, 1750–1950* (Paris: Albin Michel, 1991).

[35] René Guénon, *L'ésotérisme de Dante*, 4th ed. (Paris: Éditions Traditionnelles, 1957), 13.

[36] See Joscelyn Godwin, *The Real Rule of Four* (New York: Disinformation Company, 2005), 120–126, for a summary in English of the relevant documentation.

[37] Some of Reghini's essays, writing as Pietro Negri, are included in Julius Evola and the Gruppo di Ur, *Introduction to Magic*, trans. Guido Stucco (Rochester, VT: Inner Traditions, 2001).

Church and the suppression of Freemasonry, he devoted himself to symbolism and number theory.

Armentano had spent part of his youth in Brazil, where there was a flourishing neo-Pythagorean tradition as a result of the influence of French occultism and especially of Fabre d'Olivet. In 1909, Dario de Castro Vellozo (1869–1937) founded the Istituto Neo-Pitagorico (Neo-Pythagorean Institute) in Curitiba, enrolling many prominent members of society. It is still active in that city, where it has a Doric-style Templo das Musas (Temple of the Muses), and in other countries of South America.

Reghini and Armentano's activity rekindled awareness among Italian esotericists, hitherto more drawn to Theosophy or Anthroposophy, of their peninsular as the chosen home of Europe's first philosopher and his school. The result is a strong neo-pagan strain in contemporary Italian esotericism, vacillating between the two poles of adulation of ancient Rome and a more inward, Pythagorean path. While the former owes more to Reghini and Evola, the latter is strongly influenced by the Neapolitan Giuliano Kremmerz (Ciro Formisano, 1860–1931). In 1898, Kremmerz founded the Fratellanza Terapeutica Magica di Myriam (Magical Therapeutic Brotherhood of Myriam), a non-Masonic group (hence, including women), whose main purpose was healing through ritual magic and "Hermetic medicine." The branch in Bari, called Accademia Pitagora (Pythagoras Academy), was revived in the 1980s. On a more intellectual level, the traditions of Reghini and Kremmerz are maintained in the journal *Politica Romana*.

Pythagorean music theory has seen its strongest modern development in German-speaking countries. The Prussian parliamentarian and jurist Albert Freiherr von Thimus (1806–1878) influenced by the mythologist Georg Friedrich Creuzer, had the insight that the one unifying symbolic factor behind all ancient lore and learning might have been the discovery of the harmonic series and its association with mathematics. He applied this to a thesis of great density and erudition that embraced Chinese and Egyptian philosophy as well as the entire classical and Western tradition.[38] A main pillar of his argument is the "Pythagorean Table" or "Lambdoma," a grid or lattice with the harmonic series along one axis, the subharmonic along the other, and all tones, with their numbers, arranged in between. Among his many asides, von Thimus explained how Pythagorean harmonics concealed an esoteric knowledge of heliocentricity.[39]

[38] Albert von Thimus, *Die harmonikale Symbolik des Alterthums*, 2 vols. (Cologne: DuMout Schauberg, 1868, 1876); reprinted Hildesheim: Georg Olms, 1972.

[39] Translations of the relevant passages in Godwin, *Harmony of the Spheres*, 370–381.

Von Thimus's work, ignored in his lifetime, was taken up by Hans Kayser (1891–1964), who founded or, as he saw it, revived the essential Pythagorean science of *Harmonik* (Harmonics).[40] In his many writings, he applied the Lambdoma to such varied fields as architecture, anatomy, botany, crystallography, violin construction, composition, and, most importantly to him, theology and metaphysics. Of all the modern attempts at a "grand unified theory" on esoteric principles, Kayser's is the most wide ranging and the least infected by self-elevating claims to higher knowledge. It was continued by Rudolf Haase (b. 1920), who became a professor at the Vienna Hochschule für Musik und darstellende Kunst and in 1968 founded there the Hans-Kayser Institut für harmonikale Grundlagenforschung (Hans Kayser institute for research into harmonic principles). Haase's institute tests Kayserian Harmonics against recent developments in the natural sciences, hoping for a fruitful mutual exchange via the Pythagorean principles that (1) all is number and (2) number is best understood through the phenomenon of harmony.

[40] See Hans Kayser, *Lehrbuch der Harmonik* (Zurich: Occident-Verlag, 1950). English translation by Ariel Godwin, *Textbook of Harmonics*, n.p., Sacred Science Institute, 2006.