

The Mystical Nature of Number According to the Pythagorean Order

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Abstract

Beyond his famous theorem regarding right triangles, Pythagoras developed a spiritual connection between the assumed properties of numbers and the realities of the natural world. This mystical assignment of “number” to greater meanings of the universe culminated into a near cult following of loyalists who devoted their lives to the famous Pythagorean Order. This society of believers studied the inherent qualities of numbers under the guidance of Pythagoras.

1 Just Who was Pythagoras?

A legendary mathematician, philosopher and musician, Pythagoras conceptualized the higher power possessed by numbers and their intrinsic meanings on a scale unparalleled either before or after his time. For Pythagoras of Samos, “number is the measure of all things,” a belief so strong that it dominated his lifelong work: the creation of number mysticism in order to explain the inner workings of the *kosmos* [6]. His rationale would attract many devout followers, culminating in the creation of a society famously known as the Pythagoreans, whose dedicated studies and strict practices only furthered the intrigue of such number mysticism.

Born on the Greek island of Samos (of what is now modern day Turkey) ca. 580 BC, Pythagoras began his education at an early age. His father Mnenarchus, a reputed precious gem engraver and trader of modest success, afforded Pythagoras the luxury to exercise his philosophical gifts while attending some of the finer academies of his time [6]. His reasoning and mathematical prowess became well-known on the island, as young Pythagoras excelled in his studies, often eclipsing the mental abilities of his teachers. Likewise, his strong build and athletic ability contributed to his success as a famed sports instructor, with Pythagoras training many Samian athletes in preparation for the games in Olympia. His growing reputation began to precede him on many occasions, as Pythagoras would have to fear for his own safety since he was viewed as a potential threat by the elite of Samos, many in positions of power, many of whom were wary of fellow citizens becoming potential political rivals [2]. The region continually experienced political upheaval while under the tyrannical rule of Pylocrates, with his unstable regime precariously maintaining authority while in

the midst of regional warfare [3]. Pythagoras wisely made an exodus from his homeland in a quest for furthering his education. This arduous journey, a sort of pilgrimage, would ultimately lead Pythagoras to a Greek colony which provided stability and an escape from the turmoil of Samos.

During his prolonged travels, it is highly questionable whether or not Pythagoras ever truly ventured as far west as Egypt as some accounts attest to, and it is further disputed that he set foot in the Babylonian regions for a time during his long and arduous journey. Virtually all documents regarding his travels were destroyed long ago, with no real record existing to verify such claims [3]. Yet the majority of the documentation does cite Pythagoras as spending time at some point in his life studying both mathematics and music with Thales and Anaximander upon arriving in Croton, a province of southern Italy that at the time was a prosperous Greek colony that cherished open philosophical discussion and higher education. The influence of Thales and Anaximander, considered the premier scholars of Miletus at the time, profoundly impacted Pythagoras, as they encouraged him to devote his life to the teaching of his philosophical beliefs and share his extraordinary gift and passion for mathematics and music as they related to the natural order of the world. Essentially, his esteemed colleagues planted the seeds for Pythagoras to establish his own academy of philosophy [6]. Within a short span of time after his emigration to Croton, Pythagoras became a popular orator, drawing crowds of eventual followers as he espoused the virtues of *Number*, a collective reference favored by Pythagoras for all numbers and their associated attributes in terms of defining reality and existence. His charismatic appeal endeared Pythagoras to both ordinary citizens and prominent politicians alike, as Pythagoras' progressive impact began to lay the foundation for his academy of philosophy that would eventually transform into his secret society of Pythagoreans, the pinnacle creation of the Order devoted to number worship [3].

Indeed, Pythagoras gained a grand measure of status that would extend even further in more modern times. His intention was to create a new understanding and greater appreciation of the mystical powers of *Number*, a viewpoint grounded in philosophical belief rather than a scientific approach. To Pythagoras and the Pythagorean Order, *Number* represented "a living thing-all around them, but hidden" [3]. Bordering on obsession, Pythagoras bestowed his elegant wisdom upon his loyal followers literally until the day he died (ca. 480 BC), his demise occurring under the most peculiar of circumstances, as both accounts of his death are rife with inaccuracies. Was Pythagoras ultimately murdered in neighboring Metapontum as a result of an uprising against the Order [3], or did he perish in a fire that was deliberately set at the Shrine of the Muses, where he had sought refuge? Pythagoras' death still remains a mystery to this day [5]. Nevertheless, his numerous accomplishments and contributions to mathematics are recognized as genius, with the doctrines Pythagoras set forth regarding number mysticism still revered with near cult following. Indeed, Pythagoras' consuming dedication to the study of *Number* and all the divine portents associated with this obsession truly represented a spiritual quest for greater answers via mathematical theory and discovery as to the meaning of creation and existence.

2 The Origins of Pythagorean Number Mysticism

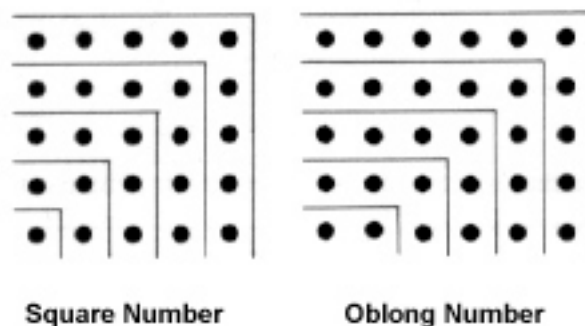
Without question, Pythagoras' personal fascination with numbers extended well beyond their basic quantified values. In his eyes, there existed unique attributes associated with each number, leading to the formation of special relationships within the concept of *Number* that would ultimately reveal the secrets of existence and the creation of the *kosmos* [6]. The Pythagoreans gradually became convinced that mathematics could explain the greater truths of reality, that the intrinsic natures of certain numbers provided the "personality in a rustic landscape" [3]. The key to unlocking the secrets of the universe, the *kosmos*, would lie in the mystical forces at work that were at the very core of *Number*. This conceptual belief in numbers representing all things in a unifying manner was at the heart of Pythagorean numerology, as Pythagoras and the Order were consumed by this rationale; the philosophical and theoretical study of *Number* would provide all the explanations as to the purpose and meaning of life beyond our earthly realm. The famous Pythagorean disciple Philolaus stated this intention clearly: "Were it not for number and its nature, nothing that exists would be clear to anybody either in itself or in its relation to other things...observe the power of number exercising itself" [3]. Through intensive examination and discovery, the Pythagoreans could attach meaning in a numerological sense, thus achieving spiritual harmony through this greater understanding. Pythagoras even concluded that our very souls were able to transcend from body to body, a "transmigration of souls" so to speak, and that there was an actual number (to be revealed later) that represented this crossing from life after death [3].

In the beginning stages of the Pythagorean Order's formation, Pythagoras revealed his fascination with the idea of extremes, formulating the concept of opposites with the initial pairing of the *limited* and *indefinite*. Defining opposites created a concrete dimensional aspect of order that fostered exploration of all things that were in-between these parameters, promoting a search for harmony [1].

The final pairing of square and oblong produces a contradiction within the table of *Pythagorean Opposites*, as "odd" is considered irregular and therefore opposes "even" which is regular. However, with the construction of square and oblong dot patterns, the initial values of each of the layers (sum of the dots) contrasts the final outcome of the construction in terms of regularity. The square is formed with consecutive odd values, while the oblong shape (a rectangle) results from consecutive even values, yet the final dimensions created show the square to be regular and the oblong as irregular. These figures were of great interest to the Pythagoreans, as their intrigue in numerology grew from the study of such disparities [1].

Figurate numbers and the associated patterns would be constantly explored by the Order, fueling the search for greater mystical connections that existed in terms of the resulting mathematical outcomes of such various constructions. A prime example is the addition of any two successive triangular numbers (1, 3, 6, 10, 15, 21...), which always yields a square number ($1 + 3 = 4$, $3 + 6 = 9$, $6 + 10 = 16$...), a discovery made by

Figure 1: Regular vs. Irregular Forms



[1]

the Order. Such behaviors hinted that numbers possessed relationships virtually at the “atomic” level; hence, form and matter shared a much greater connection in the eyes of the Pythagoreans. In fact, the use of the word “figure” in geometry traces its roots back to the Order, the result of much continuous use and study [3].

As the Pythagoreans delved deeper into such numerology in search of greater mystical connection, they proposed a clarifying distinction in order to delineate the *logistic*, the art of actual number computation, from the *arithmetic*, number theory in of itself . Convinced that the concept of number would explain the universal parameters governing the relationship of mankind, time and matter, Pythagoras vigorously guarded against natural numbers to serve merely as simple devices for solving mathematical problems. In essence, the Order’s concept of *Number* exceeded using numbers for rote utilitarian purposes alone, as the Pythagorean doctrines carefully separated concrete usage from abstract meaning [3]. *Number* was much more dynamic, containing mystical properties of higher meaning and purpose, and thus was well above typical use in mundane mathematics, becoming THE core belief of the Pythagorean Order.

One of the first numerical values to be associated with greater purpose was the principle of “fourness” as found in nature, representing the elements of earth, air, fire and water [3]. By no means a novel concept, the Pythagoreans still recognized the actual number as the “Key-bearer of Nature” [7], a cosmic symbol worthy of its status as the “most perfect of number, the root of all things” [4]. The quaternary was the foundation of the heavens, the acclaimed “chaotic matter of the heavens before being informed by the spirit,” held by the Order in highest regard for all its inherent endeavors [7]. Other numbers also held unique properties and purposes by the Pythagoreans, yet before revealing the so-called “top ten” of mystical numerology, there existed other generalities that governed the classification of number which help define their individual meanings with greater clarity.

3 The Divinity of the Trinity

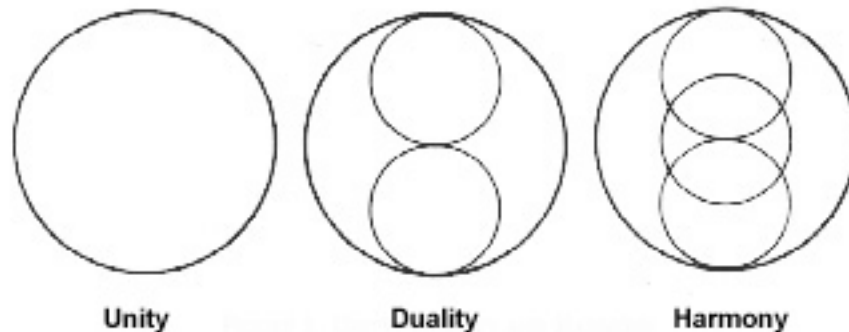
The Pythagorean Order was no longer just an academy grounded in philosophical teachings; the higher learning associated with this secretive society evolved into a virtual cult, a “religious fraternity” [3]. Pythagoras maintained a rigorous and demanding approach in the pursuit of his studies, with many of his followers equally resolute in their dedication to the Order’s efforts. Although the rules were rather strict, the Pythagoreans conducted themselves with virtue and benevolence, even welcoming women into the society when this practice was not a common contemporary one [3]. Yet bizarre practices such as avoid eating beans because they had a spirit, never pick up an object that has fallen, and do not look into a mirror beside a light were causing the Order to be more and more ostracized by outsiders (fellow citizens of Croton) who viewed such behaviors unfavorably, creating tensions that never truly eased [3].

Nonetheless,, Pythagoras continued to espouse the virtue of *Number*, suggesting that it was “a living thing,” a physical quantity like “the motion of the heavens” [1]. The universe was the result of a divine plan, these supreme numerical relations serving as the explanations for the celestial bodies above. The Order’s philosophy was predicated on the idea of *Unit*: things (living or otherwise) expressed their existence, their actual integrity, as a unitary designation with novel properties. Understandably, Pythagorean number mysticism is in no way a scientific endeavor, although there was a logical rationale behind the specific attributes of each number. The balance of *Number* rested upon the most obvious of starting points: One, or the *Monad* [3]. Regarded as the apex of the Trinity triangle and therefore a divine number, One is the natural generator of all other *Number*, regarded by the Pythagoreans as the origin from where the “geometry of the universe emerges” [7]. As the number of reason and essence, the Monad was the perfect circle of general harmony, encompassing all greater development in the unit-defining sense [4].

Logically, the “second” unit of *Number* theory was Two, or the Dyad, which represented both diversity and opinion, the truth about the divergence of nature [3]. Two was a clear departure from the unity of One, as the unit of Duality held a more insipid meaning: good versus evil potentially existed in terms of choice or reason [7]. The law of polarity demonstrates the contrast that Two can provide, this clarity of division when two things can be distinctly separated. Iamblichus, a loyal Pythagorean disciple, stressed that “an even number is that which admits to being divided” [3]. Furthermore, the Dyad (or Duad, meaning “mother”) represented the first even number, which was considered feminine by the Pythagoreans and thus merely earthly or human in the properties accorded [6].

As a result, there existed the need for re-establishing harmony, to return full circle by connecting unity (One) with diversity (Two). The unit Three, or *Triad*, would provide this bridge [3]. Considered the first true male number, Three completes the “father-mother-son” triad of religious order in triangular form, known as the Trinity. Three restored stability and reaffirmed completeness as the most basic and symbolic form found in nature, the

Figure 2: The Circles of Divinity



[1]

triangle, which only requires the minimum of three sides via linear construction [7]. The unit itself also is recognized to be the first of unequals by the Pythagoreans, since it is odd and cannot be divided into two equal parts [3]. Such strength was revered by the Order, who considered three as both “the divinity and soul of the world, the spirit of man,” a completeness personified by the three stages of beginning, middle and end [4]. Pythagoras’ Circles of Divinity depict how the collection of the initial trio of *Number* grew into such a greater meaning for the Pythagorean Order.

4 The Pythagorean Top Ten, Minus One

The units Four through Nine continued the mystical Pythagorean “*Number*” list, building off the first three units yet still possessing unique properties and attributes of their own. Four, previously described in detail, also was the unit representing either justice or retribution, the basic squaring of accounts and thus is regarded as a virtuous unit [3]. Five was considered a peculiar unit, symbolically representing the physical form of man (four limbs) plus the thinking or conscious role of man (the head), as well as the five-pointed star known as the pentacle [7]. As the sum of the *Dyad* (first female number) and *Triad* (first male number), Five was regarded as a sacred number representing marriage [3]. The Pythagoreans further associated the unit with the fifth element, ether, as a measure of heaven on earth [7]. Six was paramount since the unit projected the creation of the universe, of course not in the six calendar days of Biblical reference since this occurred well after the Pythagoreans’ time, but as the union of spirit and matter.

Pythagoras referred to the unit Seven as a perfect number since it served as the basis for the “Music of the Spheres” [7]. It was his belief that the celestial bodies produced their own concordant sound, both balanced and melodious, as a means of maintaining the

balance and harmony of the heavens [3]. Seven was essentially the number of the cosmos. The unit Eight represented justice, since it was the first to be cubed or “squared in all senses” [4]. It’s very construction and appearance demonstrated a complete passage, the “eternal spiral” as the motion of cycles as if the inhalation and exhalation of the “Great Breath” of the universe itself.

The final single digit number, the unit Nine, was defined as the “ocean” and the “horizon,” the extent to which *Number* could go with all others being “embraced and revolving within it” [4]. The *Triad* squared was man’s furthest point on the earthly plane before achieving eternal prosperity, a time whereby his soul could transcend his body and reach rebirth in yet another form of existence [2]. Thus, the unit Nine was regarded as sacred by the Pythagoreans, the final threshold before reaching the unit Ten, or *Decad*, revered as “the holiest number of all” [3].

5 The Crown Jewel of the Pythagoreans: The Tetraktys

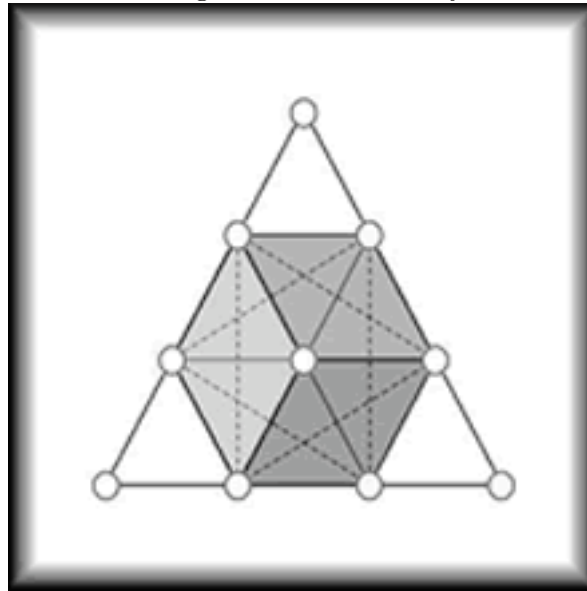
As the pinnacle achievement, Ten would be the most esteemed unit by the Order for all its inherent properties and purposes, as the unit represented a “fresh series capable of infinite expansion” [4]. Aptly named the *Tetraktys* (or *Tetractys*), its symbolic design was composed of ten dots in four rows of ordinal numerical fashion to create an equilateral triangle, giving the first four units renewed significance [3].

Thus, the dimensional properties of point (One), line (Two), plane (Three) and three-dimensional space (Four) represented both the invisible and metaphysical worlds coexisting in perfect harmony [7]. This “second Unity” was the Pythagoreans’ finest endorsement of mystical numerology, the ultimate symbol of perfection [1]. Pythagoras was so thoroughly convinced of its spiritual powers that all members of the Order were required to take the most binding of oaths to prove their sworn allegiance:

“I swear by him who the Tetraktys found, whence all our wisdom springs and which contains perennial Nature’s fountain, cause and root” [7].

In a philosophical context, the *Tetraktys* embodied the penultimate representation of the cosmic and terrestrial boundaries, as the Order held the belief that were exactly ten celestial bodies [3]. The *Tetraktys* was seemingly boundless in the properties it demonstrated: the hexagon and cube could be derived from its design [6], a testament to its encompassing greatness. Even more so, the musical intervals of 4:3 (the fourth), 3:2 (the fifth), and 2:1 (the octave) are quite evident, as Pythagoras is credited with the discovery of such musical scales [1]. Indeed, the *Tetraktys* was the universe per se in the eyes of the Order, containing the elemental constructs which serve as the very basis of Pythagorean number mysticism.

Figure 3: The Tetraktys



[6]

6 The Lasting Impressions of Pythagoras

Not to overshadow the spiritual numerology of the Pythagorean Order, Pythagoras devoted himself to related pursuits regarding the concept of *Number*. From abundant to deficient, amicable to perfect, the discovery of such number properties demonstrated Pythagoras' exceptional ability to conceive creative forms of number manipulation. Although not the cornerstones of more mystical numerology pursuits, nonetheless this rigorous study and examination of numbers in a more traditional mathematical sense provided the stepping stones for seeking divine connections. Of course, Pythagoras' legendary contribution to geometry is undoubtedly the alphabetic simplicity that $a^2 + b^2 = c^2$ reflects in its fundamental application to right triangles, a classic proof. Although not steeped in traditional, much less scientific theory, number mysticism represented the Pythagorean Order's attempt to prove that greater connections prevailed, that it was plausible to view numbers possessing something greater than just their intended values. In essence, it requires a giant leap of faith, for in order for Pythagoras to convince his followers that a bigger picture of *Number* existed, his devout followers had to accept mathematics with religious implications to a degree.

References

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